DATE	2006.10.09

Messrs. :

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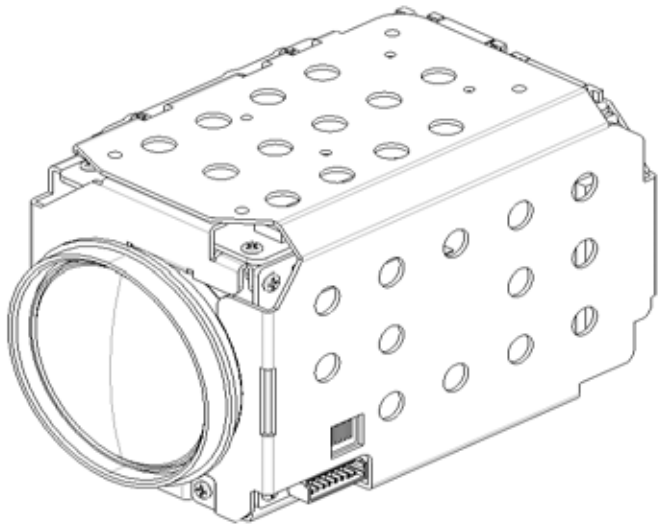
Technical Manual

Model Name	**SDM-300 N/P**

30X OPTICAL ZOOM MODULE



Part No.	
Receipt Stamp	
Remark:	

SAMSUNG TECHWIN CO., LTD
Optics & Digital Imaging Div.

<Modified History>

Revision	Date of Send	Modified Contents
Ver 1.0	March. 21. 2006	Official Version 1.0 Release
Ver 1.1	March. 24. 2006	Protocol is updated.
Ver 1.2	March. 31. 2006	Protocol is updated.
Ver 1.3	April. 03. 2006	Protocol is updated.
Ver 1.4	April. 04. 2006	Protocol is updated.
Ver 1.5	April. 10. 2006	Protocol is updated.
Ver 1.6	April. 17. 2006	Protocol is updated. 24pin connector specification is added.
Ver 1.7	April. 24. 2006	Protocol is updated.
Ver 1.8	April. 25. 2006	24pin connector specification is updated.
Ver 1.9	April. 28. 2006	Protocol is updated.
Ver 2.0	May. 02. 2006	Protocol is updated.
Ver 2.1	May. 04. 2006	Protocol is updated.
Ver 2.2	May. 04. 2006	Protocol is updated.
Ver 2.3	May. 08. 2006	Function dependency relation table is added.
Ver 2.4	May. 18. 2006	Protocol is updated. GND Inter-connection Method is added(Page.6)
Ver 2.5	May. 24. 2006	Protocol is updated.
Ver 2.6	June. 14. 2006	Protocol is updated.
Ver 2.7	July. 03. 2006	Operating Temperature is changed. (Page.5)
Ver 2.8	Aug. 28. 2006	Protocol is updated.
Ver 2.9	Sep. 05. 2006	Protocol is updated.
Ver 3.0	Sep. 07. 2006	Protocol is updated.
Ver 3.1	Sep. 12. 2006	Protocol is updated.
Ver 3.2	Sep. 14. 2006	Protocol is updated.
Ver 3.3	Sep. 20. 2006	Protocol is updated.
Ver 3.4	Oct. 09. 2006	Protocol is updated.

Contents

1. Product Model

SDM-300 N/P (N:NTSC, P:PAL)

2. Features

■ DNR(Digital Noise Reduction)

By using the DSP chip applied to the DNR technology, the amount of low illuminance noise has been significantly reduced, and the signal-to-noise ratio(S/N) as well as horizontal resolution has been improved, resulting in a clear and sharp image display even in the dark.

■ 30x Optical Zoom

The SDM-300 built-in x30 optical zoom lens is highly reliable. It features auto focus, auto iris and zoom function.

■ High Resolution

The horizontal resolution of 520TV Lines at Color mode and 570TV Lines at BW mode can be achieved by using a high density CCD having Double Speed 410,000 pixels SONY CCD, which provides clean, noiseless and reliable pictures.

■ Day & Night (ICR)

An infrared(IR) Cut-Filter can be disengaged from the image path for increased sensitivity in low light environments. The ICR will automatically engage depending on the ambient light, allowing the camera to be effective in day&night environment.

■ Privacy zone masking(max. 32 zones / 4 programmable zone per screen)

The privacy zone function makes it possible to mask specific areas of the scene from view.

■ Electrical Flip function

The SDM-300 has function of H/V reverse mode.

■ Motion Detection(4 programmable zone per screen)

You can transmits an alert signal when it detects motion of an object on the screen. This feature is useful when you have to monitor several screens simultaneously.

■ Digital Output

It is available to digital output of the ITU-656 Format.

■ Image Stabilizer

The SDM-300 has function of digital image stabilization.

3. Camera Specifications

Specifications		SDM-300N	SDM-300P	Note
POWER	Input Voltage	DC 8V ~ 15V		
	Power Consumption	4.8W at 12V		
CCD	Size	1/4 inch, Interline Transfer CCD		
	Total Pixels	811(H) x 508(V)	795(H) x 596(V)	
	Effective Pixels	768(H) x 494(V)	752(H) x 582(V)	
OPTICS	Optics	30X, f=3.3 to 99.0mm(F 1.6 to 3.4)		
	Min. Focus Distance	1000mm		
	D. ZOOM	Off / On (Limit 10x)		
	Angle Field of view	H : Appr. 58.0°(Wide) to 2.22°(Tele) / V : Appr. 44.8°(Wide) to 1.68°(Tele)		
Sync.	Scanning System	2:1 Interlace		
	Synchronization	Internal / Line-Lock		
	Frequency	H:15.734 KHz/V:59.94 Hz	H: 15.625 KHz/V : 50.00 Hz	
ELECTRICAL	Resolution	520TV Lines(Min.):Color / 570TV Lines(Min.):B/W		
	Min. Illumination	0.6Lux/F1.6(50 IRE):Color / 0.1Lux/F1.6(50 IRE):B/W		
	S/N (Y signal)	50dB (AGC Off, Weight ON)		
	Video Output	CVBS : 1.0Vp-p/75Ω		
	Focus	Auto / Manual / One-Push		
	Zoom Movement Speed	5.2 Sec : Wide to Tele	5.4 Sec : Wide to Tele	
	IRIS Control	Auto / Manual		
	Lens Initialize	Built-In		
	Camera Title	On / Off (Displayed 20 characters)		
	Camera ID	255 ID Selectable		
	Day & Night	Auto / Color / BW(ICR)		
	Gain Control	Low / Middle / High / Off Selectable		
	White Balance	ATW[Indoor(3,000K~6,500K), Outdoor(1,800K~10,500K)] / AWC / Manual		
	Back Light Compensation	Low / Middle / High / Off Selectable		
	Electronic shutter speed	Auto / Manual / A.FLK (X128~1/60sec~/120,000sec)	Auto / Manual / A.FLK (X128 ~1/50sec ~ 1/120,000sec)	
	O.S.D	Built-In		
	Motion Detection	On / Off (output via communication)		
	Control output	RS-232C CMOS Level (2400, 4800, 9600, 19200, 38400, and 57600bps Selectable)		
	SSNR	Low / Middle / High / Off Selectable		
	Privacy Function	On / Off (32 Zones, 4 Programmable Zones per Screen)		
	FLIP	On / Off		
	MIRROR	On / Off		
	Image Stabilizer	On / Off		
	PRESET	8 Positions (Stored with Internal EEPROM)		
	Digital Output	ITU-656 Format (8 bits)		
Operating Temperature/Humidity		-10℃ to +50℃ / 20% to 80% RH		
Storge Temperature/Humidity		-20℃ to +60℃ / 20% to 95% RH		
Dimension		48.6(W)×53.8(H)×87(D)mm		
Weight		165g		

* Design and specification are subject to change without notice.

4. Precautions

1) Do not install the unit in an area that is dusty,greasy,wet or humid to avoid a decline in performance or operational failure.

2) Do not install the unit in an area that is subject to vibration. Also, protect the unit from any sudden impact or any kind of vibration as these may cause a decline in a performance or an operation failure.

3) Avoid placing the unit in an area exposed to direct sunlight that would cause the temperature inside the unit to rise resulting in an operation failure.

4) Be sure to use the specified screws of installing the camera unit. If not, serioue damage to the camera unit may occur.

5) Always turn off the power supply before unplugging the interface connector. Failure to do this may cause an operational failure.
And, do not apply excessive voltage.(Use only the specified voltage)
Otherwise, you may get an electric shock or a fire may occur.

6) Always connect the power supply to the correct positive (+) and negative (-) terminals.Improper connections to the power supply will cause an operational failure.

7) Should you wish to use the camera unit for anything other than its intended use, please contact the manufacturer in advance.

8) It is recommended that auto-focus not be used on following subjects and scene.
- subjects with very dark surface (such as the black cloths or black curtain).
- subjects with very glossy or shiny surface (such as the exterior of automobiles).
- subjects with very little brightness contrast (such as the wall)
- subjects with very little or very strong back-lighting.
- scenes having a strong contrast between the right and left halves of the screen
- subjects with an object in front of them (such as animals in a cage)

9) GND Inter-connection Method
-. To avoid electric shock, we recommend module bracket to connect to target system's main GND(ex. body contact, or lug wire etc.)

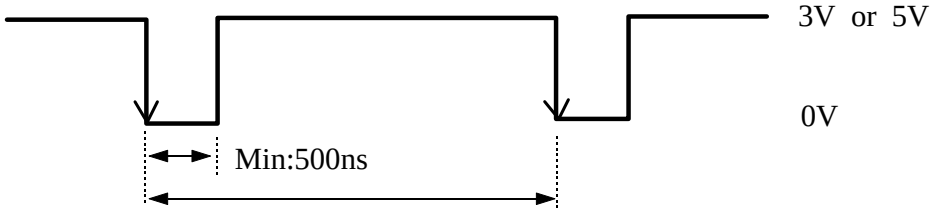
5. Pin Specification for Camera Control Interface

Connecting Condition

■**9 Pin FFC Connector :** 08-6224-009-001-800(Kyocera)
(Speed Dome Camera)

PIN_NO.	NAME	I/O	COMMENT.
1	**GND**	-	
2	**TRIGGER_IN**	Input	External Line-Lock Pulse (Negative, 3 or 5Vp-p)
3	**GND**	-	
4	**VIDEO_OUT**	Output	CVBS : 1.0Vp-p/75Ω
5	**GND**	-	
6	**DC-IN**	Input	DC 8~15V(Recommended : 9V or 12V)
7	**GND**	-	
8	**TxD(for RS-232C)**	Output	CMOS Level(Low : Max.0.8V, High : Min. 2.7V)
9	**RxD(for RS-232C)**	Input	CMOS Level(Low : Max.0.8V, High : Min. 2.7V)

Trigger IN : Sync. to falling edge

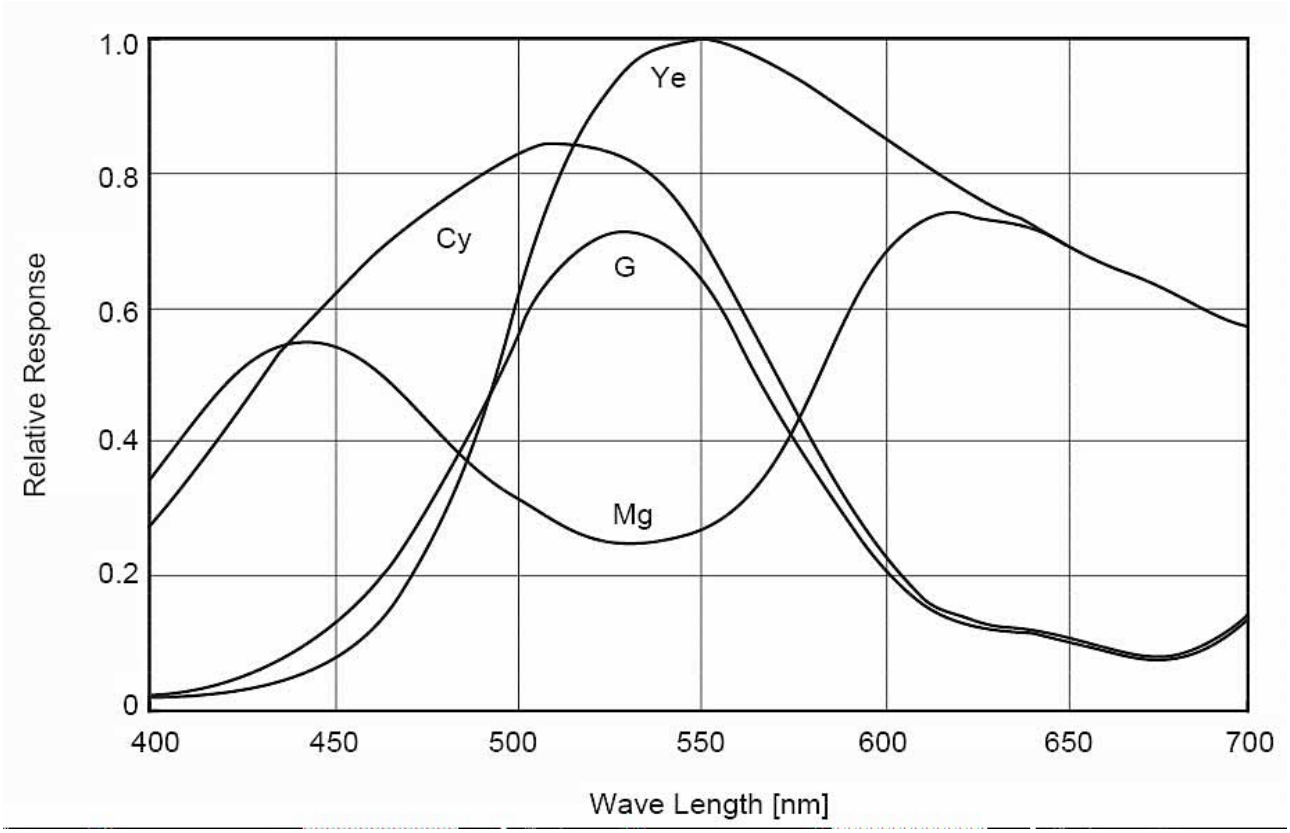


60Hz ± 0.1Hz(NTSC)
50Hz ± 0.1Hz(PAL)

■24 Pin FFC Connector : 05004HR-24A01S(G)(WWW.YEONHO.COM)
(ZOOM BOX CAMERA)

PIN_NO.	NAME	I/O	COMMENT
1	**RESERVED**	-	NC
2	**RESERVED**	-	NC
3	**VIDEO_OUT**	OUT	CVBS : 1.0Vp-p/75Ω
4	**GND**	-	-
5	**NC**	-	-
6	**GND**	-	-
7	**TXD**	OUT	CMOS Level(Low : Max.0.8V, High : Min. 2.7V)
8	**RXD**	INT	CMOS Level(Low : Max.0.8V, High : Min. 2.7V)
9	**GND**	-	-
10	**PWR_DISP**	OUT	After MICOM Initialize,the signal goes high(Reserved)
11	**485_CONT**	OUT	Control the RS-485 communication direction.(Reserved)
12	**MD**	OUT	After motion is detected, the signal goes high(Reserved)
13	**K_AF**	IN	On Push AF KEY IN
14	**K_S**	IN	SET KEY IN
15	**K_R**	IN	RIGHT KEY IN
16	**K_L**	IN	LEFT KEY IN
17	**K_U**	IN	UP KEY IN
18	**K_D**	IN	DOWN KEY IN
19	**GND**	-	-
20	**GND**	-	-
21	**DC_IN**	Input	DC 8～15V(Recommended : 9V or 12V)
22	**DC_IN**	Input	DC 8～15V(Recommended : 9V or 12V)
23	**+3.3V**	OUT	Use the communication(RS-232 or 485) IC and LED control only.
24	**+5V**	OUT	Not recommend use this pin

6. Spectral Sensitivity Characteristics



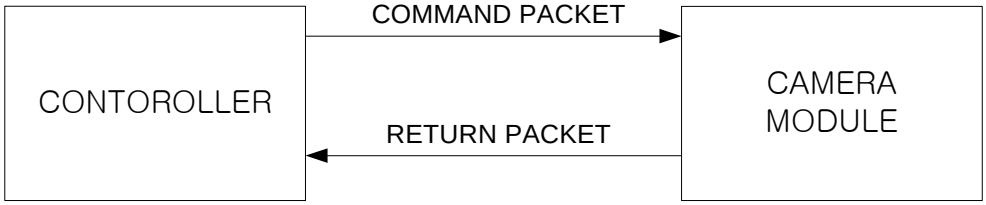
7. Communication Format

■ Communication Protocol

- communication speed : 2400bps, 4800bps, 9600bps, 19200bps, 38400bps(default), 57600bps
- start bit : 1 bit
- data bit : 8 bits
- parity bit : even(default), odd, none
- stop bit : 1 bit

■ Communication Sequence

In this Command Reference, 'Command Packet' is defined as the packet sent from Host-Controller and 'Return Packet' is defined as the packet sent from Module Camera.
The Communication concludes when Host-controller receives a Return Packet from the Module Camera to a Command Packet as follows.
This Command Reference prescribes the Command Packet, Return Packet and the Time To between receipt of a Command Packet and transmission of a Return Packet.



■ Communication Packet Format

- Packet Type A consists of 6bytes, and Type B consists of 8bytes.

- Packet Format Type A.

Command Packet						ACK Packet					
W1	W2	W3	W4	W5	W6	W1	W2	W3	W4	W5	W6

[notes] Command Packet : Sending command from controller to camera
Return Packet : Sending back data from camera to controller

[Command Packet]

1st bit	W1	STX	Start of Text	A0h
2nd bit	W2	Command	Command	00h~FFh
3rd bit	W3	Parameter1	data	00h~FFh
4th bit	W4	Parameter2	data	00h~FFh
5th bit	W5	Parameter3	data	00h~FFh
6th bit	W6	ETX	End of Text	AFh

[Return Packet]

1st bit	W1	STX	Start of Text	A0h
2nd bit	W2	Command	Command	00h~FFh
3rd bit	W3	Parameter1	data	00h~FFh
4th bit	W4	Parameter2	data	00h~FFh
5th bit	W5	Parameter3	data	00h~FFh
6th bit	W6	ETX	End of Text	AFh

- Packet Format Type B.

Command Packet								ACK Packet							
W1	W2	W3	W4	W5	W6	W7	W8	W1	W2	W3	W4	W5	W6	W7	W8

[notes] Command Packet : Sending command from controller to camera
Return Packet : Sending back data from camera to controller

[Command Packet]

1st bit	W1	STX	Start of Text	A1h
2nd bit	W2	Command	Command	00h~FFh
3rd bit	W3	Parameter1	data	00h~FFh
4th bit	W4	Parameter2	data	00h~FFh
5th bit	W5	Parameter3	data	00h~FFh
6th bit	W6	Parameter4	data	00h~FFh
7th bit	W7	Parameter5	data	00h~FFh
8th bit	W8	ETX	End of Text	AFh

[Return Packet]

1st bit	W1	STX	Start of Text	A1h
2nd bit	W2	Command	Command	00h~FFh
3rd bit	W3	Parameter1	data	00h~FFh
4th bit	W4	Parameter2	data	00h~FFh
5th bit	W5	Parameter3	data	00h~FFh
6th bit	W6	Parameter4	data	00h~FFh
7th bit	W7	Parameter5	data	00h~FFh
8th bit	W8	ETX	End of Text	AFh

8. Command List

■ Command List of Transmitting

No.	Command Name	Reset					
1	Function	Reset All Data To Factory Default Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**01h**	00h	00h	00h	AFh
	Return Packet	A0h	**01h**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Reboot					
2	Function	Camera rebooting.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**02h**	00h	00h	00h	AFh
	Return Packet	A0h	**02h**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Save					
3	Function	Save current camera setup status.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**04h**	00h	00h	00h	AFh
	Return Packet	A0h	**04h**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Zoom Motor Stop					
4	Function	Stop Zoom Lens Movement					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**10h**	00h	00h	00h	AFh
	Return Packet	A0h	**10h**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Zoom Start					
5	Function	Move Zoom Lens To Tele / Wide Direction And Set Zoom Motor Speed.					
	Remark	During processing to the specific direction, if you wish to change direction, you have to stop zoom motor before changing direction. P3 data is used for only zoom tracking speed.					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**11h**	**P1**	**P2**	**P3**	AFh
	Return Packet	A0h	**11h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1: 00h = Tele End 01h = Wide End P2: 01h = Zoom Speed 1 (Min) 02h = Zoom Speed 2 03h = Zoom Speed 3 04h = Zoom Speed 4 05h = Zoom Speed 5 06h = Zoom Speed 6 07h = Zoom Speed 7 08h = Zoom Speed 8 (Factory default Max) P3: 00h = No skip 01h = 12 VD skip 02h = 10 VD skip 03h = 8 VD skip 04h = 6 VD skip 05h = 4 VD skip 06h = 2 VD skip 07h = 1 VD skip					

No.	Command Name	Zoom Direct					
6	Function	Move Zoom Lens To Target Position Directly.					
	Remark	If P1P2 is not 06EAh(Tele-end), P3 is digital zoom position.					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**12h**	**P1**	**P2**	**P3**	AFh
	Return Packet	A0h	**12h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1P2(Zoom): 0000h~06EAh = Target Position P3(D-Zoom): ((256 * 10) / Ratio_X) - 1 ex) If Ratio_X is 11, P3 is E7h. (Ratio_X = 11 : 1.1x) If Ratio_X is 20, P3 is 7Fh. (Ratio_X = 20 : 2x)					

No.	Command Name	Focus Motor Stop					
7	Function	Stop Focus Lens Movement					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**19h**	00h	00h	00h	AFh
	Return Packet	A0h	**19h**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Focus Start					
8	Function	Move Focus Lens To Near / Far Direction.					
	Remark	Focus mode: Manual / Zoom Trigger					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**1Ah**	**P1**	00h	00h	AFh
	Return Packet	A0h	**1Ah**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = Near direction 01h = Far direction					

No.	Command Name	Focus Direct					
9	Function	Move Focus Lens To Target Position Directly.					
	Remark	Focus mode: Manual / Zoom Trigger Min/Max limit of target position varies from zoom position. Min/Max limit can get from command AAh. Before sending this command, you should get the information of Min/Max Limit from command AAh to avoid sending wrong data.					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**1Bh**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**1Bh**	**P1**	**P2**	00h	AFh
	Parameter	P1P2: Target Position					

No.	Command Name	Focus Setup					
10	Function	Set Focus Mode, Zoom Tracking, Zoom Speed, And Zoom Magnification Display Mode On The Screen. And Set Digital Zoom Mode and Limitation.					
	Remark	**Please make sure if it has a return packet after mode is changed.**					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**1Ch**	**P1**	**P2**	**P3**	AFh
	Return Packet	A0h	**1Ch**	**P1**	**P2**	**P3**	AFh
	Parameter	P1: BIT1~BIT0 = 00 = Manual Mode BIT1~BIT0 = 01 = Auto Mode BIT1~BIT0 = 10 = Zoom Trigger Mode(Factory default) P2: BIT7 = 0 = Zoom Tracking Mode Off BIT7 = 1 = Zoom Tracking Mode On(Factory default) BIT6 = 0 = Zoom Tracking Speed Fast(Factory default) BIT6 = 1 = Zoom Tracking Speed Slow BIT5 = 0 = Zoom magnification Display Off(Factory default) BIT5 = 1 = Zoom magnification Display On P3: BIT7 = 0 = D-Zoom Off(Factory default) BIT7 = 1 = D-Zoom On BIT3~0 = 0000 = D-Zoom limit 2x BIT3~0 = 0001 = D-Zoom limit 3x BIT3~0 = 0010 = D-Zoom limit 4x BIT3~0 = 0011 = D-Zoom limit 5x BIT3~0 = 0100 = D-Zoom limit 6x BIT3~0 = 0101 = D-Zoom limit 7x BIT3~0 = 0110 = D-Zoom limit 8x BIT3~0 = 0111 = D-Zoom limit 9x BIT3~0 = 1000 = D-Zoom limit 10x					

No.	Command Name	One Shot AF					
11	Function	Execute One-shot Auto Focus Function					
	Remark	This command will find focus point immediately at any time.					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**1Dh**	00h	00h	00h	AFh
	Return Packet	A0h	**1Dh**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Brightness Setup					
12	Function	Adjust Brightness Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**1Eh**	**P1**	00h	00h	AFh
	Return Packet	A0h	**1Eh**	**P1**	00h	00h	AFh
	Parameter	P1: 00h~64h 32h = Factory default					

No.	Command Name	AWB Setup					
13	Function	Set AWB Mode, Color Temperature And Manual Offset.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**1Fh**	**P1**	**P2**	**P3**	AFh
	Return Packet	A0h	**1Fh**	**P1**	**P2**	**P3**	AFh
	Parameter	P1: BIT7~BIT6 = 00 = ATW(Factory default) mode BIT7~BIT6 = 01 = AWC mode BIT7~BIT6 = 10 = Manual mode BIT0 = 0 = ATW OUTDOOR BIT0 = 1 = ATW INDOOR P2(Manual Red offset): 00h~64h 1Eh = Factory default P3(Manual Blue offset): 00h~64h Blue offset 28h = Factory default					

No.	Command Name	BackLight Setup					
14	Function	Set BackLight Mode.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**20h**	**P1**	00h	00h	AFh
	Return Packet	A0h	**20h**	**P1**	00h	00h	AFh
	Parameter	P1 : 00h = OFF(Factory default) 01h = Low 02h = Middle 03h = High					

No.	Command Name	Sync Setup					
15	Function	Set Sync Mode And Adjust Line-Lock Phase Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**21h**	**P1**	**P2**	**P3**	AFh
	Return Packet	A0h	**21h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1(Mode): 00h = Internal(Factory default) 01h = Line Lock P2P3(Phase Value)					

No.	Command Name	Iris Setup					
16	Function	Set Iris Mode And Manual Iris Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**23h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**23h**	**P1**	**P2**	00h	AFh
	Parameter	P1(Mode): 00h = Auto(Factory default) 01h = Manual P2(Manual Value): 00h~64h 32h = Factory default					

* This table shows F number according to the manual value.

P2	F#	P2	F#	P2	F#	P2	F#	P2	F#
00h	Close	14h	F8.30	28h	F4.15	3Ch	F2.77	50h	F2.08
01h	F165.97	15h	F7.90	29h	F4.05	3Dh	F2.73	51h	F2.05
02h	F82.99	16h	F7.54	2Ah	F3.95	3Eh	F2.68	52h	F2.03
03h	F55.32	17h	F7.22	2Bh	F3.86	3Fh	F2.64	53h	F2.00
04h	F41.49	18h	F6.92	2Ch	F3.77	40h	F2.60	54h	F1.98
05h	F33.19	19h	F6.64	2Dh	F3.69	41h	F2.56	55h	F1.96
06h	F27.66	1Ah	F6.38	2Eh	F3.61	42h	F2.52	56h	F1.94
07h	F23.71	1Bh	F6.15	2Fh	F3.53	43h	F2.48	57h	F1.92
08h	F20.75	1Ch	F5.93	30h	F3.46	44h	F2.45	58h	F1.90
09h	F18.44	1Dh	F5.72	31h	F3.39	45h	F2.41	59h	F1.87
0Ah	F16.60	1Eh	F5.53	32h	F3.32	46h	F2.38	5Ah	F1.85
0Bh	F15.09	1Fh	F5.35	33h	F3.25	47h	F2.34	5Bh	F1.83
0Ch	F13.83	20h	F5.19	34h	F3.19	48h	F2.31	5Ch	F1.81
0Dh	F12.77	21h	F5.03	35h	F3.13	49h	F2.28	5Dh	F1.80
0Eh	F11.86	22h	F4.88	36h	F3.07	4Ah	F2.25	5Eh	F1.78
0Fh	F11.06	23h	F4.74	37h	F3.02	4Bh	F2.22	5Fh	F1.76
10h	F10,37	24h	F4.61	38h	F2.96	4Ch	F2.19	60h	F1.74
11h	F9.76	25h	F4.49	39h	F2.91	4Dh	F2.16	61h	F1.72
12h	F9.22	26h	F4.37	3Ah	F2.86	4Eh	F2.13	62h	F1.70
13h	F8.74	27h	F4.26	3Bh	F2.81	4Fh	F2.11	63h	F1.69
								64h	F1.67

No.	Command Name	AGC / SSNR Setup					
17	Function	Set Auto Gain Control Mode And SSNR(Digital Noise Reduction) Mode.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**26h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**26h**	**P1**	**P2**	00h	AFh
	Parameter	P1: (AGC) 00h = Off 01h = Low 02h = Middle(Factory default) 03h = High P2:(SSNR) 00h = Off 01h = Low 02h = Middle(Factory default) 03h = High					

No.	Command Name	Shutter Setup					
18	Function	Set Shutter Mode And Manual Shutter Speed Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**24h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**24h**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = ESC(Factory default) 01h = Manual 02h = Anti-Flicker P2: 19h(NTSC:1/120000, PAL:1/120000) 18h(NTSC:1/60000, PAL:1/60000) 17h(NTSC:1/30000, PAL:1/30000) 16h(NTSC:1/10000, PAL:1/10000) 15h(NTSC:1/7000, PAL:1/7000) 14h(NTSC:1/5000, PAL:1/5000) 13h(NTSC:1/2500, PAL:1/2500) 12h(NTSC:1/1600, PAL:1/1600) 11h(NTSC:1/1000, PAL:1/1000) 10h(NTSC:1/700, PAL:1/700) 0Fh(NTSC:1/500, PAL:1/500) 0Eh(NTSC:1/250, PAL:1/250) 0Dh(NTSC:1/120, PAL:1/100) 0Ch(NTSC:1/60, PAL:1/50) = Factory default 0Bh(NTSC:x2, PAL:x2) 0Ah(NTSC:x4, PAL:x4) 09h(NTSC:x6, PAL:x6) 08h(NTSC:x8, PAL:x8) 07h(NTSC:x10, PAL:x10) 06h(NTSC:x12, PAL:x12) 05h(NTSC:x14, PAL:x14) 04h(NTSC:x16, PAL:x16) 03h(NTSC:x24, PAL:x24) 02h(NTSC:x32, PAL:x32) 01h(NTSC:x64, PAL:x64) 00h(NTSC:x128, PAL:x128)					

No.	Command Name	SensUp Setup					
19	Function	Set SensUp Mode And Limit.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**25h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**25h**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = OFF 01h = AUTO(Factory default) P2: 00h(x2) 01h(x4) = Factory default 02h(x6) 03h(x8) 04h(x10) 05h(x12) 06h(x14) 07h(x16) 08h(x24) 09h(x32) 0Ah(x64) 0Bh(x128)					

No.	Command Name	Day Night Setup					
20	Function	Set Day Night mode.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**27h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**27h**	**P1**	**P2**	00h	AFh
	Parameter	P1: BIT7~BIT6 = 00 = COLOR Mode(Factory default) BIT7~BIT6 = 01 = B/W Mode BIT7~BIT6 = 10 = AUTO Mode BIT0 = 0 = B/W Burst Mode Off(Factory default) BIT0 = 1 = B/W Burst Mode On P2: Color Burst Level = 00h ~ 64h 32h(Factory default)					

No.	Command Name	Sharpness Setup					
21	Function	Set Sharpness Mode and Adjust Sharpness Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**29h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**29h**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = OFF 01h = ON(Factory default) P2: 00h~1Fh 08h(Factory default)					

No.	Command Name	Color Setup					
22	Function	Adjust Color Saturation Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**2Ah**	**P1**	00h	00h	AFh
	Return Packet	A0h	**2Ah**	**P1**	00h	00h	AFh
	Parameter	P1: 00h~64h 32h = Factory default					

No.	Command Name	Motion Detection Setup					
23	Function	Set Motion Detection And Alarm Display Mode.					
	Remark	If the motion is detected, camera automatically returns the packet indicating the motion detected, [A0h 97h 01h 00h 00h AFh] then after 5 seconds, camera returns the no motion detected packet. [A0h 97h 00h 00h 00h AFh]					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**2Bh**	**P1**	00h	00h	AFh
	Return Packet	A0h	**2Bh**	**P1**	00h	00h	AFh
	Parameter	P1(Mode): 00h = Off(Factory default) 01h = On					

No.	Command Name	Lens Initialization Setup					
24	Function	Execute Lens Initialization.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**31h**	00h	00h	00h	AFh
	Return Packet	A0h	**31h**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Privacy Setup					
25	Function	Set Privacy Mode, Group, Group Color, And Group Area					
	Remark	After privacy mask configuration, save it by [A0h 04h 00h 00h 00h AFh]. Camera saves mask configuration except Pan/Tilt angle. Then follow commands should be provided to camera every time system starts. Left/Top Position : [A1h 3Ah P1 P2 P3 P4 P5 AFh] Right/Bottom Position : [A1h 3Bh P1 P2 P3 P4 P5 AFh]					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**37h**	**P1**	**P2**	**P3**	AFh
	Return Packet	A0h	**37h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1 : BIT7 = 0 = Privacy Mode Off (Factory default) BIT7 = 1 = Privacy Mode On BIT6~BIT3 = 0000 = Group1(Factory default) BIT6~BIT3 = 0001 = Group2 BIT6~BIT3 = 0010 = Group3 BIT6~BIT3 = 0011 = Group4 BIT6~BIT3 = 0100 = Group5 BIT6~BIT3 = 0101 = Group6 BIT6~BIT3 = 0110 = Group7 BIT6~BIT3 = 0111 = Group8 BIT2~BIT1 = 00 = Area1(Factory default) BIT2~BIT1 = 01 = Area2 BIT2~BIT1 = 10 = Area3 BIT2~BIT1 = 11 = Area4 P2 : 00h ~ 09h = Mask Color (05h : Factory default) P3: BIT3 = 0 = Area 4 Mode Off(Factory default) BIT3 = 1 = Area 4 Mode On BIT2 = 0 = Area 3 Mode Off(Factory default) BIT2 = 1 = Area 3 Mode On BIT1 = 0 = Area 2 Mode Off(Factory default) BIT1 = 1 = Area 2 Mode On BIT0 = 0 = Area 1 Mode Off(Factory default) BIT0 = 1 = Area 1 Mode On					

No.	Command Name	Privacy Mask Guidance Axis Display For Interacting With Pan And Tilt					
26	Function	Display The Guidance Axis For Privacy Mask Area Position Setup					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**34h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**34h**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = Left/Up axis selection 01h = Right/Down axis selection P2: 00h = Display Off 01h = Display On					

No.	Command Name	Privacy Area Left and Top Position Setup							
27	Function	Set Privacy Area Left And Top Value Of Selected Area Of Each Group.							
	Remark	This command should execute before command 3Bh.							
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
	Command Packet	A1h	**3Ah**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Return Packet	A1h	**3Ah**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Parameter	P1: BIT7~BIT4 = 0000 = Group1(Factory default) BIT7~BIT4 = 0001 = Group2 BIT7~BIT4 = 0010 = Group3 BIT7~BIT4 = 0011 = Group4 BIT7~BIT4 = 0100 = Group5 BIT7~BIT4 = 0101 = Group6 BIT7~BIT4 = 0110 = Group7 BIT7~BIT4 = 0111 = Group8 BIT3~BIT2 = 00 = Area1(Factory default) BIT3~BIT2 = 01 = Area2 BIT3~BIT2 = 10 = Area3 BIT3~BIT2 = 11 = Area4 P2P3(Normalized Radian Value for Left Position): 0000h~1921h P4P5(Normalized Radian Value for Top Position): 0000h~1921h ※ Left Position: (0 ~ 2π) x 2^{10} Top Position: (0 ~ 2π) x 2^{10}							

No.	Command Name	Privacy Area Right and Bottom Position Setup							
28	Function	Set Privacy Area Right And Bottom Value Of Selected Area Of Each Group.							
	Remark	This command should execute after command 3Ah							
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
	Command Packet	A1h	**3Bh**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Return Packet	A1h	**3Bh**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Parameter	P1: BIT7~BIT4 = 0000 = Group1(Factory default) BIT7~BIT4 = 0001 = Group2 BIT7~BIT4 = 0010 = Group3 BIT7~BIT4 = 0011 = Group4 BIT7~BIT4 = 0100 = Group5 BIT7~BIT4 = 0101 = Group6 BIT7~BIT4 = 0110 = Group7 BIT7~BIT4 = 0111 = Group8 BIT3~BIT2 = 00 = Area1(Factory default) BIT3~BIT2 = 01 = Area2 BIT3~BIT2 = 10 = Area3 BIT3~BIT2 = 11 = Area4 P2P3(Normalized Radian Value for Right Position): 0000h~1921h P4P5(Normalized Radian Value for Bottom Position): 0000h~1921h ※ Right Position: (0 ~ 2π) x 2^{10} Bottom Position: (0 ~ 2π) x 2^{10}							

No.	Command Name	Pan And Tilt Angle For Privacy							
29	Function	Read Current Pan And Tilt Angle Value For Interacting With Privacy Mask							
	Remark	Whenever pan and tilt are moving, this command should be provided to camera for interacting with privacy mask. Moving Status(P5) is the data to compensate mask display error when pan/tilt moves.							
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
	Command Packet	A1h	**3Ch**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Return Packet	A1h	**3Ch**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Parameter	P1P2(Pan Angle): 0000h~1921h P3P4(Tilt Angle): 0000h~1921h P5(Moving Status): BIT3 = (Tilt Direction (+): 0, Tilt Direction (-): 1) BIT2 = (Tilt Moving Off: 0, Tilt Moving On: 1) BIT1 = (Pan Direction (+): 0, Pan Direction (-): 1) BIT0 = (Pan Moving Off: 0, Pan Moving On: 1) ※ Pan Angle: (0 ~ 2π) x 2^{10} Tilt Angle: (0 ~ 2π) x 2^{10} Angle Resolution: 360° / 6433(1921h) ≒ 0.05°							

No.	Command Name	Exec AWC					
30	Function	Execution AWC					
	Remark	This command is only available under AWC Mode After send this command, camera automatically returns the AWC status packet until AWC completed. AWC not completed : [A0h B9h 00h 00h 00h AFh] AWC completed : [A0h B9h 01h 00h 00h AFh]					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**40h**	00h	00h	00h	AFh
	Return Packet	A0h	**40h**	00h	00h	00h	AFh
	Parameter						

No.	Command Name	Communication Setup					
31	Function	Set Serial Communication Setup. (Baud Rate & Parity Bit)					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**41h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**41h**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = 2400 bps 03h = 19200 bps 01h = 4800 bps 04h = 38400 bps(Default) 02h = 9600 bps 05h = 57600 bps P2: 00h = 8-E-1(8Bits, Even Parity, 1 Stop Bit)(Default) 01h = 8-O-1(8Bits, Odd Parity, 1 Stop Bit) 02h = 8-N-1(8Bits, None Parity, 1 Stop Bit)					

No.	Command Name	H-Rev, V-Rev, Freeze Setup					
32	Function	Set Horizontal Reverse, Vertical Reverse, and Freeze Mode.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**44h**	**P1**	**P2**	**P3**	AFh
	Return Packet	A0h	**44h**	00h	00h	00h	AFh
	Parameter	P1(Horizontal): 00h = Off 01h = On P2(Vertical): 00h = Off 01h = On P3(Freeze): 00h = Off 01h = On					

No.	Command Name	DIS Mode Setup					
33	Function	Set DIS Mode.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**35h**	**P1**	00h	00h	AFh
	Return Packet	A0h	**35h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = OFF(Factory default) 01h = ON					

No.	Command Name	Pan/Tilt Moving Status					
34	Function						
	Remark	Whenever controller's pan or tilt position is varied, please send this command to improve camera performance.					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**36h**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**36h**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = Pan Stop 01h = Pan Moving P2: 00h = Tilt Stop 01h = Tilt Moving					

No.	Command Name	Error Msg Disp Setup					
35	Function	System Error Message Display or Not display					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**4Ah**	**P1**	00h	00h	AFh
	Return Packet	A0h	**4Ah**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = Display On 01h = Display Off					

No.	Command Name	Camera Title Setup							
36	Function	Set Camera Title String and Display Position On The Screen							
	Remark								
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
	Command Packet	A1h	**03h**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Return Packet	A1h	**03h**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Parameter	Packet 1: P1(Mode): 00h = OFF , 01h = ON P2 = X position(NTSC:03h~1Eh, PAL:01h~1Ch) P3 = Y position(02h~0Bh) P4 = string length(01h~14h) Packet 2: P1 = Character No.1 of String P2 = Character No.2 of String P3 = Character No.3 of String P4 = Character No.4 of String P5 = Character No.5 of String Packet 3: P1 = Character No.6 of String P2 = Character No.7 of String P3 = Character No.8 of String P4 = Character No.9 of String P5 = Character No.10 of String Packet 4 P1 = Character No.11 of String P2 = Character No.12 of String P3 = Character No.13 of String P4 = Character No.14 of String P5 = Character No.15 of String Packet 5 P1 = Character No.16 of String P2 = Character No.17 of String P3 = Character No.18 of String P4 = Character No.19 of String P5 = Character No.20 of String							

<Title String Data>

Hex	Character	Hex	Character	Hex	Character	Hex	Character
01h	A	14h	T	27h	m	3Ah	5
02h	B	15h	U	28h	n	3Bh	6
03h	C	16h	V	29h	o	3Ch	7
04h	D	17h	W	2Ah	p	3Dh	8
05h	E	18h	X	2Bh	q	3Eh	9
06h	F	19h	Y	2Ch	r	3Fh	'\b'[Blank]
07h	G	1Ah	Z	2Dh	s	40h	(
08h	H	1Bh	a	2Eh	t	41h	)
09h	I	1Ch	b	2Fh	u	42h	<
0Ah	J	1Dh	c	30h	v	43h	>
0Bh	K	1Eh	d	31h	w	44h	-
0Ch	L	1Fh	e	32h	x	45h	/
0Dh	M	20h	f	33h	y	46h	#
0Eh	N	21h	g	34h	z	47h	*
0Fh	O	22h	h	35h	0	48h	!
10h	P	23h	i	36h	1	49h	?
11h	Q	24h	j	37h	2	4Ah	,
12h	R	25h	k	38h	3	4Bh	.
13h	S	26h	l	39h	4		

No.	Command Name	Preset Save					
37	Function	Save current preset information and number.					
	Remark	You can save follow function setup - FOCUS MODE - ZOOM TRACKING - ZOOM SPEED - D-ZOOM - BRIGHTNESS - IRIS - SHUTTER - AGC - SSNR - SENS-UP - AWB - BACKLIGHT - MOTION DETECTION - DAY/NIGHT - H-REV -V-REV - SHARPNESS - COLOR					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**45h**	**P1**	00h	00h	AFh
	Return Packet	A0h	**45h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = PRESET 1 01h = PRESET 2 02h = PRESET 3 03h = PRESET 4 04h = PRESET 5 05h = PRESET 6 06h = PRESET 7 07h = PRESET 8					

No.	Command Name	Preset Move					
38	Function	Set specific preset.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**46h**	**P1**	00h	00h	AFh
	Return Packet	A0h	**46h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = PRESET 1 01h = PRESET 2 02h = PRESET 3 03h = PRESET 4 04h = PRESET 5 05h = PRESET 6 06h = PRESET 7 07h = PRESET 8					

No.	Command Name	Preset Clear					
39	Function	Clear specific preset.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**47h**	**P1**	00h	00h	AFh
	Return Packet	A0h	**47h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = PRESET 1 01h = PRESET 2 02h = PRESET 3 03h = PRESET 4 04h = PRESET 5 05h = PRESET 6 06h = PRESET 7 07h = PRESET 8					

No.	Command Name	Focus Limit Extend					
40	Function	Set Far Focus Limit Extend or Not Extend.					
	Remark	If infinite scene is out of focus, use extend focus far limit. (**P1**) Wide MOD adjustment (**P2**)					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**ADh**	**P1**	**P2**	00h	AFh
	Return Packet	A0h	**ADh**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = Far Limit Extend (Factory Default) 01h = Not Far Limit Extend P2: 00h = Near Limit Extend (Factory Default) 01h = Not Near Limit Extend					

No.	Command Name	Auto Refresh Setup					
41	Function	Set Auto Refresh by Specific Duration					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**49h**	**P1**	00h	00h	AFh
	Return Packet	A0h	**49h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = Off 01h = 1 Day Duration 02h = 2 Day Duration 03h = 3 Day Duration 04h = 4 Day Duration 05h = 5 Day Duration 06h = 6 Day Duration 07h = 7 Day Duration					

No.	Command Name	Key Function					
42	Function	Control Key Function To Operate OSD Menu Or Zoom And Focus Lens.					
	Remark	When OSD is ON, key function works to change OSD menu setup. When OSD is OFF, key function works to move zoom and focus lens. This command is mainly used to control Box Type Zoom Camera or change communication setup by OSD					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**A0h**	**P1**	00h	00h	AFh
	Return Packet	A0h	**A0h**	**P1**	00h	00h	AFh
	Parameter	P1: 01h = Set Key 02h = Up Key / Tele Key 03h = Down Key / Wide Key 04h = Left Key / Near Key 05h = Right Key / Far Key					

■ Command List of Receiving

No.	Command Name	Call Camera Information					
1	Function	Read TV Type, S/W Version And System Error.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**80h**	00h	00h	00h	AFh
	Return Packet	A0h	**80h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1: 00h = NTSC 01h = PAL P2: S/W Version Number ex) P2: 1Bh, it means V2.7 P3: 00h = "No System Error" 01h = "Zoom Motor Error" 02h = "Focus Motor Error" 04h = "Day&Night Motor Error" 08h = "EEPROM Error"					

No.	Command Name	Call Zoom Position					
2	Function	Read Current Zoom Lens Position.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**82h**	00h	00h	00h	AFh
	Return Packet	A0h	**82h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1P2: 0000h(Wide) ~ 06EAh(Tele) P3(D-Zoom Value): 00h = zero digital zoom position FFh(1x) ~ 18h(10x)					

No.	Command Name	Call Focus Position					
3	Function	Read Current Focus Lens Position.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**83h**	00h	00h	00h	AFh
	Return Packet	A0h	**83h**	**P1**	**P2**	00h	AFh
	Parameter	P1P2: Min Position (Near) ~ Max Position (Far)					

No.	Command Name	Call AF Setup					
4	Function	Read Current Focus Mode, Zoom Tracking Mode, Zoom Speed, Zoom Magnification Display Mode, Digital Zoom Mode, Limit And Digital Zoom Limitation Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**84h**	00h	00h	00h	AFh
	Return Packet	A0h	**84h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1: BIT1~BIT0 = 00 = Manual Mode BIT1~BIT0 = 01 = Auto Mode BIT1~BIT0 = 10 = Zoom Trigger Mode P2: BIT7 = 0 = Zoom Tracking Mode Off BIT7 = 1 = Zoom Tracking Mode On BIT6 = 0 = Zoom Speed Fast BIT6 = 1 = Zoom Speed Slow BIT5 = 0 = Zoom magnification Display Off BIT5 = 1 = Zoom magnification Display On P3: BIT7 = 0 = D-Zoom OFF BIT7 = 1 = D-Zoom ON BIT3~0 = 0000 = D-Zoom limit 2x BIT3~0 = 0001 = D-Zoom limit 3x BIT3~0 = 0010 = D-Zoom limit 4x BIT3~0 = 0011 = D-Zoom limit 5x BIT3~0 = 0100 = D-Zoom limit 6x BIT3~0 = 0101 = D-Zoom limit 7x BIT3~0 = 0110 = D-Zoom limit 8x BIT3~0 = 0111 = D-Zoom limit 9x BIT3~0 = 1000 = D-Zoom limit 10x					

No.	Command Name	Call Brightness Setup					
5	Function	Read Current Brightness Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**86h**	00h	00h	00h	AFh
	Return Packet	A0h	**86h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h ~ 64h					

No.	Command Name	Call AWB Setup					
6	Function	Read Current Auto White Balance Mode State.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**87h**	00h	00h	00h	AFh
	Return Packet	A0h	**87h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1: BIT7~BIT6 = 00 = ATW Mode BIT7~BIT6 = 01 = AWC Mode BIT7~BIT6 = 10 = Manual Mode BIT0 = 0 = ATW OUTDOOR BIT0 = 1 = ATW INDOOR P2: 00h~64h = Manual Red offset P3: 00h~64h = Manual Blue offset					

No.	Command Name	Call BackLight Setup					
7	Function	Read Current Backlight Mode And WDR Limit.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**88h**	00h	00h	00h	AFh
	Return Packet	A0h	**88h**	**P1**	00h	00h	AFh
	Parameter	P1 : 00h = Off 01h = Low 02h = Middle 03h = High					

No.	Command Name	Call Sync Setup					
8	Function	Read Current SYNC Mode And Line Lock Phase Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**89h**	00h	00h	00h	AFh
	Return Packet	A0h	**89h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1(Mode): 00h = Internal 01h = Line Lock P2P3(Value): Line Lock Phase Value					

No.	Command Name	Call Freeze, H-Rev, V-Rev Setup					
9	Function	Read Current Freeze Mode, Horizontal Reverse And Vertical Reverse Mode.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**8Ah**	00h	00h	00h	AFh
	Return Packet	A0h	**8Ah**	**P1**	**P2**	**P3**	AFh
	Parameter	P1(Freeze): 00h = Off 01h = On P2(Horizontal): 00h = Off 01h = On P3(Vertical): 00h = Off 01h = On					

No.	Command Name	Call IRIS Setup					
10	Function	Read Current Iris Mode And Iris Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**8Bh**	00h	00h	00h	AFh
	Return Packet	A0h	**8Bh**	**P1**	**P2**	00h	AFh
	Parameter	P1(Mode): 00h = Auto 01h = Manual P2(Value): 00h~64h					

No.	Command Name	Call Shutter Setup					
11	Function	Read Current Shutter Mode And Shutter Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**8Ch**	00h	00h	00h	AFh
	Return Packet	A0h	**8Ch**	**P1**	**P2**	00h	AFh
	Parameter	P1: 00h = ESC 01h = Manual 02h = Anti-Flicker P2: 19h(NTSC:1/120000, PAL:1/120000) 18h(NTSC:1/60000, PAL:1/60000) 17h(NTSC:1/30000, PAL:1/30000) 16h(NTSC:1/10000, PAL:1/10000) 15h(NTSC:1/7000, PAL:1/7000) 14h(NTSC:1/5000, PAL:1/5000) 13h(NTSC:1/2500, PAL:1/2500) 12h(NTSC:1/1600, PAL:1/1600) 11h(NTSC:1/1000, PAL:1/1000) 10h(NTSC:1/700, PAL:1/700) 0Fh(NTSC:1/500, PAL:1/500) 0Eh(NTSC:1/250, PAL:1/250) 0Dh(NTSC:1/120, PAL:1/100) 0Ch(NTSC:1/60, PAL:1/50) 0Bh(NTSC:x2, PAL:x2) 0Ah(NTSC:x4, PAL:x4) 09h(NTSC:x6, PAL:x6) 08h(NTSC:x8, PAL:x8) 07h(NTSC:x10, PAL:x10) 06h(NTSC:x12, PAL:x12) 05h(NTSC:x14, PAL:x14) 04h(NTSC:x16, PAL:x16) 03h(NTSC:x24, PAL:x24) 02h(NTSC:x32, PAL:x32) 01h(NTSC:x64, PAL:x64) 00h(NTSC:x128, PAL:x128)					

No.	Command Name	Call SensUp Setup					
12	Function	Read Current SensUp Mode And Limit.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**8Dh**	00h	00h	00h	AFh
	Return Packet	A0h	**8Dh**	**P1**	**P2**	00h	AFh
	Parameter	P1(SensUp Mode): 00h = Off 01h = Auto P2(SensUp Limit): 00h(x2) 01h(x4) 02h(x6) 03h(x8) 04h(x10) 05h(x12) 06h(x14) 07h(x16) 08h(x24) 09h(x32) 0Ah(x64) 0Bh(x128)					

No.	Command Name	Call AGC / SSNR Setup					
13	Function	Read Current AGC And SSNR Mode.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**8Eh**	00h	00h	00h	AFh
	Return Packet	A0h	**8Eh**	**P1**	**P2**	00h	AFh
	Parameter	P1(AGC): 00h = Off 01h = Low 02h = Middle(Factory default) 03h = High P2(SSNR): 00h = Off 01h = Low 02h = Middle(Factory default) 03h = High					

No.	Command Name	Call Day Night Setup					
14	Function	Read Current Day And Night Setup.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**8Fh**	00h	00h	00h	AFh
	Return Packet	A0h	**8Fh**	**P1**	**P2**	00h	AFh
	Parameter	P1: BIT7~BIT6 = 00 = COLOR Mode BIT7~BIT6 = 01 = B/W Mode BIT7~BIT6 = 10 = AUTO Mode BIT0 = 0 = B/W Burst Mode Off BIT0 = 1 = B/W Burst Mode On P2 (Color Burst Value) : 00h ~ 64h					

No.	Command Name	Call Sharpness Setup					
15	Function	Read Current Sharpness Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**91h**	00h	00h	00h	AFh
	Return Packet	A0h	**91h**	**P1**	**P2**	00h	AFh
	Parameter	P1(Mode): 00h = Off 01h = On P2(Sharpness Value): 00h~1Fh					

No.	Command Name	Call Color Setup					
16	Function	Read Current Color Saturation Value.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**92h**	00h	00h	00h	AFh
	Return Packet	A0h	**92h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h~64h					

No.	Command Name	Call Motion Detection Setup					
17	Function	Read Current Motion Detection Mode And Sensitivity.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**96h**	00h	00h	00h	AFh
	Return Packet	A0h	**96h**	**P1**	00h	00h	AFh
	Parameter	P1(Mode): 00h = Off 01h = On					

No.	Command Name	Call Motion Detection State					
18	Function	Read Current Motion Detection State					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**97h**	00h	00h	00h	AFh
	Return Packet	A0h	**97h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = No Motion Detected 01h = Motion Detected					

No.	Command Name	Call Privacy Setup					
19	Function	Read Current Privacy Setup Status.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**98h**	00h	00h	00h	AFh
	Return Packet	A0h	**98h**	**P1**	**P2**	**P3**	AFh
	Parameter	P1: BIT7 = 0 = Privacy Mode Off BIT6~BIT3 = 0000 = Group1 BIT6~BIT3 = 0010 = Group3 BIT6~BIT3 = 0100 = Group5 BIT6~BIT3 = 0110 = Group7 BIT2~BIT1 = 00 = Area1 BIT2~BIT1 = 10 = Area3 P2 : 00h ~ 09h = Mask Color P3: BIT3 = 0 = Area 4 Mode Off BIT2 = 0 = Area 3 Mode Off BIT1 = 0 = Area 2 Mode Off BIT0 = 0 = Area 1 Mode Off		BIT7 = 1 = Privacy Mode On BIT6~BIT3 = 0001 = Group2 BIT6~BIT3 = 0011 = Group4 BIT6~BIT3 = 0101 = Group6 BIT6~BIT3 = 0111 = Group8 BIT2~BIT1 = 01 = Area2 BIT2~BIT1 = 11 = Area4 BIT3 = 1 = Area 4 Mode On BIT2 = 1 = Area 3 Mode On BIT1 = 1 = Area 2 Mode On BIT0 = 1 = Area 1 Mode On			

No.	Command Name	Call Privacy Group Status					
20	Function	Read Current Privacy Group Status					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**93h**	**B1**	00h	00h	AFh
	Return Packet	A0h	**93h**	**P1**	**P2**	**P3**	AFh
	Parameter	B1: 00h = Group1 01h = Group2 02h = Group3 03h = Group4 04h = Group5 05h = Group6 06h = Group7 07h = Group8 P1 : BIT7~BIT4 = 0000 = Group1 BIT7~BIT4 = 0001 = Group2 BIT7~BIT4 = 0010 = Group3 BIT7~BIT4 = 0011 = Group4 BIT7~BIT4 = 0100 = Group5 BIT7~BIT4 = 0101 = Group6 BIT7~BIT4 = 0110 = Group7 BIT7~BIT4 = 0111 = Group8 BIT3~BIT2 = 00 = Area1 BIT3~BIT2 = 01 = Area2 BIT3~BIT2 = 10 = Area3 BIT3~BIT2 = 11 = Area4 P2: 00h ~ 09h = Mask Color P3: BIT3 = 0 = Area 4 Mode Off BIT3 = 1 = Area 4 Mode On BIT2 = 0 = Area 3 Mode Off BIT2 = 1 = Area 3 Mode On BIT1 = 0 = Area 2 Mode Off BIT1 = 1 = Area 2 Mode On BIT0 = 0 = Area 1 Mode Off BIT0 = 1 = Area 1 Mode On					

No.	Command Name	Call AF Status					
21	Function	Read Auto Focus Algorithm Status.					
	Remark	Focus Mode: Auto / Zoom Trigger					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**A9h**	00h	00h	00h	AFh
	Return Packet	A0h	**A9h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = AF Algorithm is Busy. 01h = AF Algorithm is Complete Work.					

No.	Command Name	Call Current Focus Range					
22	Function	Read Current Focus Min / Max Range According To Zoom Position					
	Remark	Before sending Focus Direct Command, you should send this command to get Min/Max focus range according to zoom position.					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**AAh**	**B1**	**B2**	**B3**	AFh
	Return Packet	A0h	**AAh**	**P1**	**P2**	**P3**	AFh
	Parameter	B1B2: Zoom Position = 0000h ~ 06EAh B3: 00h = Focus Limit Min 01h = Focus Limit Max P1P2: Focus Limit Value P3: 00h = Focus Limit Min 01h = Focus Limit Max					

No.	Command Name	Call DIS Mode					
23	Function	Read Current DIS Mode					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**B2h**	00h	00h	00h	AFh
	Return Packet	A0h	**B2h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = Off 01h = On					

No.	Command Name	Call AWC Status					
24	Function	Read Current AWC Status					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**B9h**	00h	00h	00h	AFh
	Return Packet	A0h	**B9h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = AWC Not Completed 01h = AWC Completed					

No.	Command Name	Call OSD status					
25	Function	Read Current OSD Status.					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**A4h**	00h	00h	00h	AFh
	Return Packet	A0h	**A4h**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = OSD Off 01h = OSD On					

No.	Command Name	Call Camera Title Setup							
26	Function	Read Camera Title String & Position.							
	Remark								
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
	Command Packet	A1h	**85h**	00h	00h	00h	00h	00h	AFh
	Return Packet	A1h	**85h**	**P1**	**P2**	**P3**	**P4**	**P5**	AFh
	Parameter	Packet 1: P1(Mode): 00h = OFF , 01h = ON P2 = X position(NTSC:03h~1Eh, PAL:01h~1Ch) P3 = Y position(02h~0Bh) P4 = string length(01h~14h) Packet 2: P1 = Character No.1 of String P2 = Character No.2 of String P3 = Character No.3 of String P4 = Character No.4 of String P5 = Character No.5 of String Packet 3: P1 = Character No.6 of String P2 = Character No.7 of String P3 = Character No.8 of String P4 = Character No.9 of String P5 = Character No.10 of String Packet 4 P1 = Character No.11 of String P2 = Character No.12 of String P3 = Character No.13 of String P4 = Character No.14 of String P5 = Character No.15 of String Packet 5 P1 = Character No.16 of String P2 = Character No.17 of String P3 = Character No.18 of String P4 = Character No.19 of String P5 = Character No.20 of String								

ASCII	CHARACTER	ASCII	CHARACTER	ASCII	CHARACTER	ASCII	CHARACTER
65	A	85	U	111	o	56	8
66	B	86	V	112	p	57	9
67	C	87	W	113	q	32	'\b'[Blank]
68	D	88	X	114	r	40	(
69	E	89	Y	115	s	41	)
70	F	90	Z	116	t	60	<
71	G	97	a	117	u	62	>
72	H	98	b	118	v	45	-
73	I	99	c	119	w	47	/
74	J	100	d	120	x	35	#
75	K	101	e	121	y	42	*
76	L	102	f	122	z	33	!
77	M	103	g	48	0	63	?
78	N	104	h	49	1	44	,
79	O	105	i	50	2	46	.
80	P	106	j	51	3		
81	Q	107	k	52	4		
82	R	108	l	53	5		
83	S	109	m	54	6		
84	T	110	n	55	7		

No.	Command Name	Call Auto Refresh Setup					
27	Function	Read Current Auto Refresh Setup					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**BAh**	00h	00h	00h	AFh
	Return Packet	A0h	**BAh**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = Off 01h = 1 Day Duration 02h = 2 Day Duration 03h = 3 Day Duration 04h = 4 Day Duration 05h = 5 Day Duration 06h = 6 Day Duration 07h = 7 Day Duration					

No.	Command Name	Auto Refresh Status					
28	Function						
	Remark	If Auto Refresh Status command is satisfied, camera automatically returns this packet. At first, after Auto Refresh Start packet transmission, lens initialization is started 1 second later. After lens initialization, Auto Refresh End packet is sent.					
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**BBh**	00h	00h	00h	AFh
	Return Packet	A0h	**BBh**	**P1**	00h	00h	AFh
	Parameter	P1: 00h = Auto Refresh End 01h = Auto Refresh Start					

No.	Command Name	Call Day & Night Function					
29	Function	Read Day & Night Function Status. (Enable or Disable)					
	Remark						
		Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
	Command Packet	A0h	**81h**	00h	00h	00h	AFh
	Return Packet	A0h	**81h**	**P1**	00h	00h	AFh
	Parameter	P1 : 00h = Day & Night Function Disable 01h = Day & Night Function Enable					

9. Function Overview

■ Function Initial Setup Table

Function Mode	Initial Setting	Sub Function
Cam Title	Off	Yes
White Balance	ATW	Yes
Backlight	Off	Yes
Motion Detection	Off	Yes
Focus	Zoom Trigger	No
Zoom Tracking	On	No
Zoom Speed	Fast	No
Digital Zoom	Off	Yes
Display Zoom Magnification	Off	No
Brightness Level	50	No
Iris	Auto	Yes
Shutter	Esc	Yes
AGC	Middle	No
SSNR(Noise Reduction)	Middle	No
Sens-Up(Slow Shutter)	Auto	Yes
Privacy	Off	Yes
Day/Night	Color	Yes
Sync	Internal	Yes
Freeze	Off	No
H-Rev(horizontal reverse)	Off	No
V-Rev(vertical reverse)	Off	No
Sharpness Mode	On	Yes
Color Level	50	No
DIS(Image Stabilizer)	Off	No

■ Function Dependency Relation Table

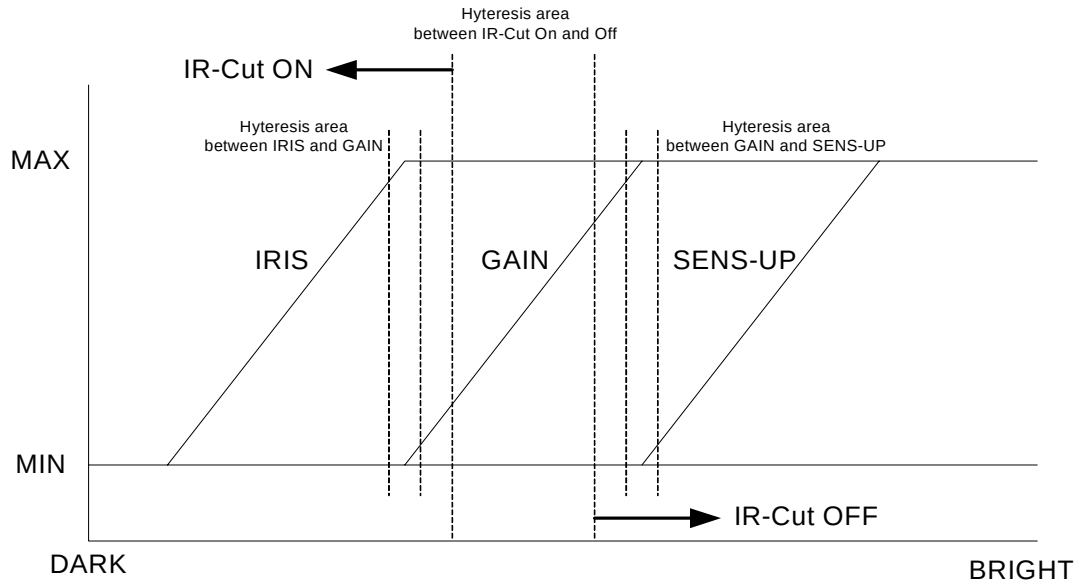
Function Mode		Dependency
Iris	On	Shutter ESC disabled
	Off	None
Shutter	ESC	None
	Manual	Sens-Up Auto disabled
	A.FLK	Sens-Up Auto disabled
AGC	Off	SSNR Auto disabled Sens-Up Auto disabled Day & Night Auto disabled
	Low	None
	Middle	None
	High	None
Focus	Manual	Zoom Tracking On disabled
	Auto	None
	One-Push	None
Others		None

■ Focus

- **Auto Mode**
  - Auto Focust mode adjusts the focus position Automatically.
- **Zoom Trigger Mode**
  - Whenever zoom position is changed, camera becomes Auto Focus mode to adjust focus position. After it finished, focus position is fixed and camera changes back to Zoom Trigger mode.
- **Manual Mode**
  - Focus position can be adjusted by manual only.
- **One Shot AF Function**
  - Whenever One Shot AF command is sent, camera becomes Auto Focus mode to adjust focus position. After it finished, focus position is fixed and camera changes back to Zoom Trigger mode.

■ Exposure

- **Default Setting Diagram**



- **Brightness**
  - Brightness value is the target luminance.
    Iris, shutter, and gain will work to keep the target luminance.
- **Iris**
  - Iris Auto
    Iris gets the highest priority to control exposure automatically, and shutter is fixed.
    If Backlight, AGC, SSNR, DayNight, and Sens-up mode are not Off,
    according to input luminance level, they will work to keep the target brightness.
  - Iris Manual
    Iris is fixed, and give the exposure control priority to other resources.
- **Shutter**
  - Shutter ESC
    If Iris mode is manual and shutter mode is ESC, shutter gets the highest priority to control

exposure automatically. According to input luminance value, Backlight, AGC, SSNR, DayNight, and Sens-up will work. if they are not Off.

- Shutter Anti-Flicker

  In case of NTSC, shutter speed value is fixed to 1/100.

  In case of PAL, shutter speed value is fixed to 1/120.

- Shutter Manual

  Shutter speed value can be set by manually.

· **AGC and SSNR**

- When Input luminance level is too dark, AGC will make brighter image automatically.
- When gain level is higher and higher, SSNR will reduce the gain noise to make clearer image.

· **Sens-Up**

- When Input luminance level is too dark, Sens-Up(Slow Shutter) function is set automatically. User can select the sens-up limit value.

· **Day Night**

- DayNight Auto

  When Input luminance level is low, IR Cut Filter is switched to the B/W position for increasing infrared sensitivity automatically. And, it switches back to Color position when luminance is quite increased.

- DayNight Color

  IR-Cut Filter is fixed to color position.

- DayNight B/W

  IR-Cut Filter is fixed to B/W position.

[Note]

When DayNight mode is set to Auto under the condition of the strong IR light, A malfunction of IR-Cut filter may occur.

· **Backlight**

- When the input image background is too bright, BLC function will work to make the object of image clearer.

■ White Balance

· **ATW Mode**

- This mode automatically adjusts color temperature range from 1800K to 10500K. It can select INDOOR and OUTDOOR mode.

· **AWC Mode**

- Whenever this mode is sent, camera becomes ATW mode to adjust color temperature. After it finished, color temperature is fixed.

· **Manual Mode**

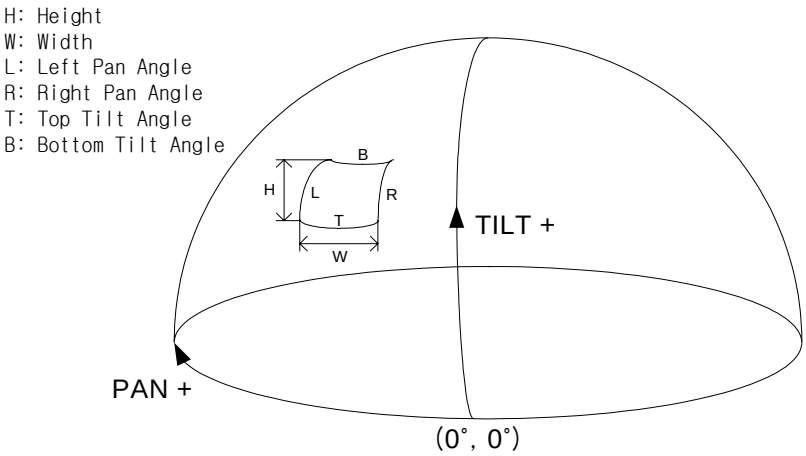
- R/B gain can be adjusted by manual.

■ Privacy Mask

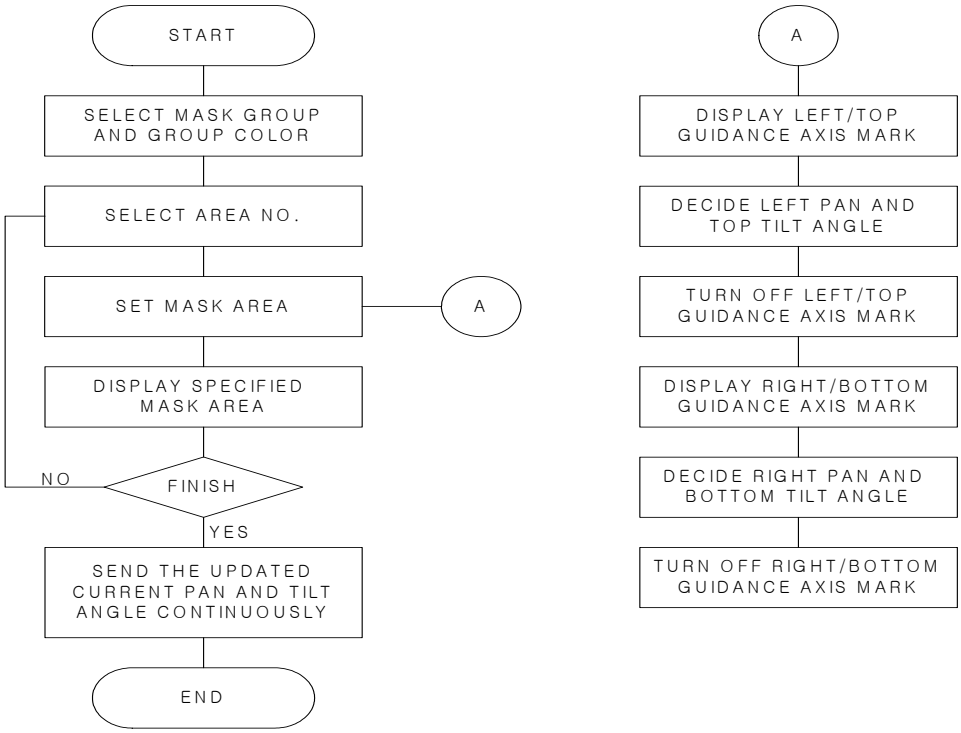
· **Feature**

- Total 32 mask zones divided by 8 groups.
- Mask can set on 4 positions per group on the screen.
- User can select mask color of each group.
- Mask area can be controlled by individual On/Off.
- Every masks are interacting with Pan, Tilt, and Zoom position.

· **Privacy mask Interacting with Pan/Tilt**



- Pan/Tilt angle data should be converted to normalized radian value before sending to camera.
- Converted Pan/Tilt value: [Radian(Angle)] x 2^{10} , Angle: 0° ~ 360°
- Pan Value Range: (0 ~ 2π) x 2^{10}
  Tilt Value Range: (0 ~ 2π) x 2^{10}
  Angle Resolution: 360° / 6433(1921h) ≒ 0.05°
- Height ≤ 45° , Width ≤ 45°
- Flowchart of privacy mask display sequence



■ Others

- **H-Rev / V-Rev / Freeze**
  - H-Rev function reverses the output image horizontally.
  - V-Rev function flips over the output image vertically.
  - Freeze function captures the output image using memory.
- **Digital Zoom**
  - Digital Zoom function enlarges the output image using memory by digitally.
- **DIS(Digital Image Stabilizer)**
  - DIS function compensates the vibration of camera.

  [Note]
  - **DIS can not work properly under the conditions as follows**
    - **Dark Scene**
    - **Low Contrast Scene like White Wall etc.**
    - **High Frequency Vibration**
    - **During Pan, Tilt, Zoom, and Focus moving**
    - **During Iris, Shutter, and Gain working**
  - **Because DIS uses Digital Zoom Function to compensate the vibration, The Image Resolution is decreased.**

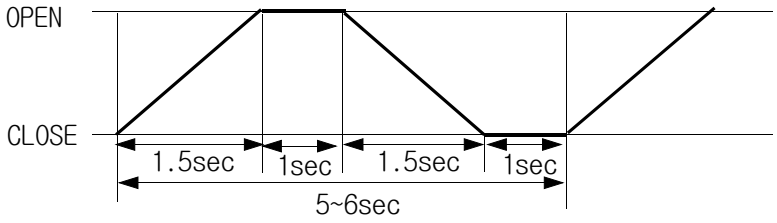
10. DC Power Supply

- Voltage Source : DC 8V～15V
- Power Consumption : 3.15W(steady-state)
  4.5 W(Max. :)

11. Reliability and Environment Condition

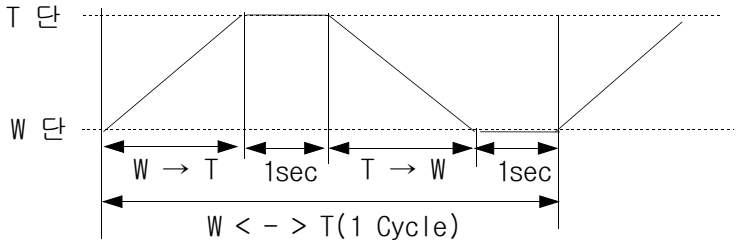
- IRIS : 500,000 times(Room Temperature)

The change of Iris's speed or the failure of the iris's operation should not happen when the Iris's operation is tested for the 500,000 times from CLOSE to OPEN. A time's cycle is 5sec~6sec.



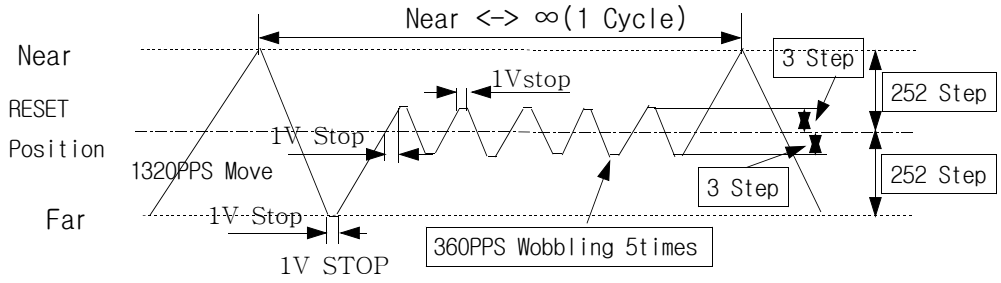
- ZOOM : 500,000 times

The failure of Zooming operation should not happen when Zooming is tested for the 500,000 times from TELE to WIDE.
The step between TELE and WIDE is 1,743.
The test should be done by the following speed condition.



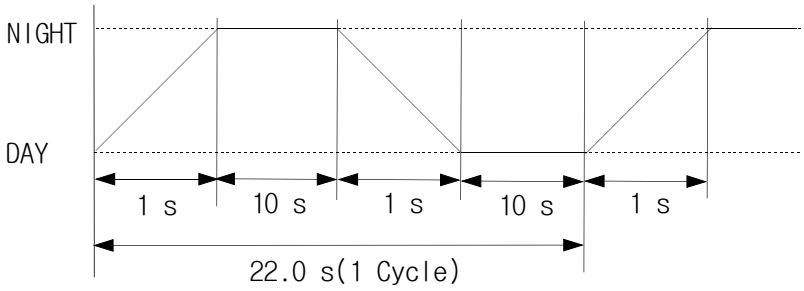
- Focus : 500,000 times

The failure of Focusing operation should not happen when Focusing is tested by the following cycle for the 500,000 times.



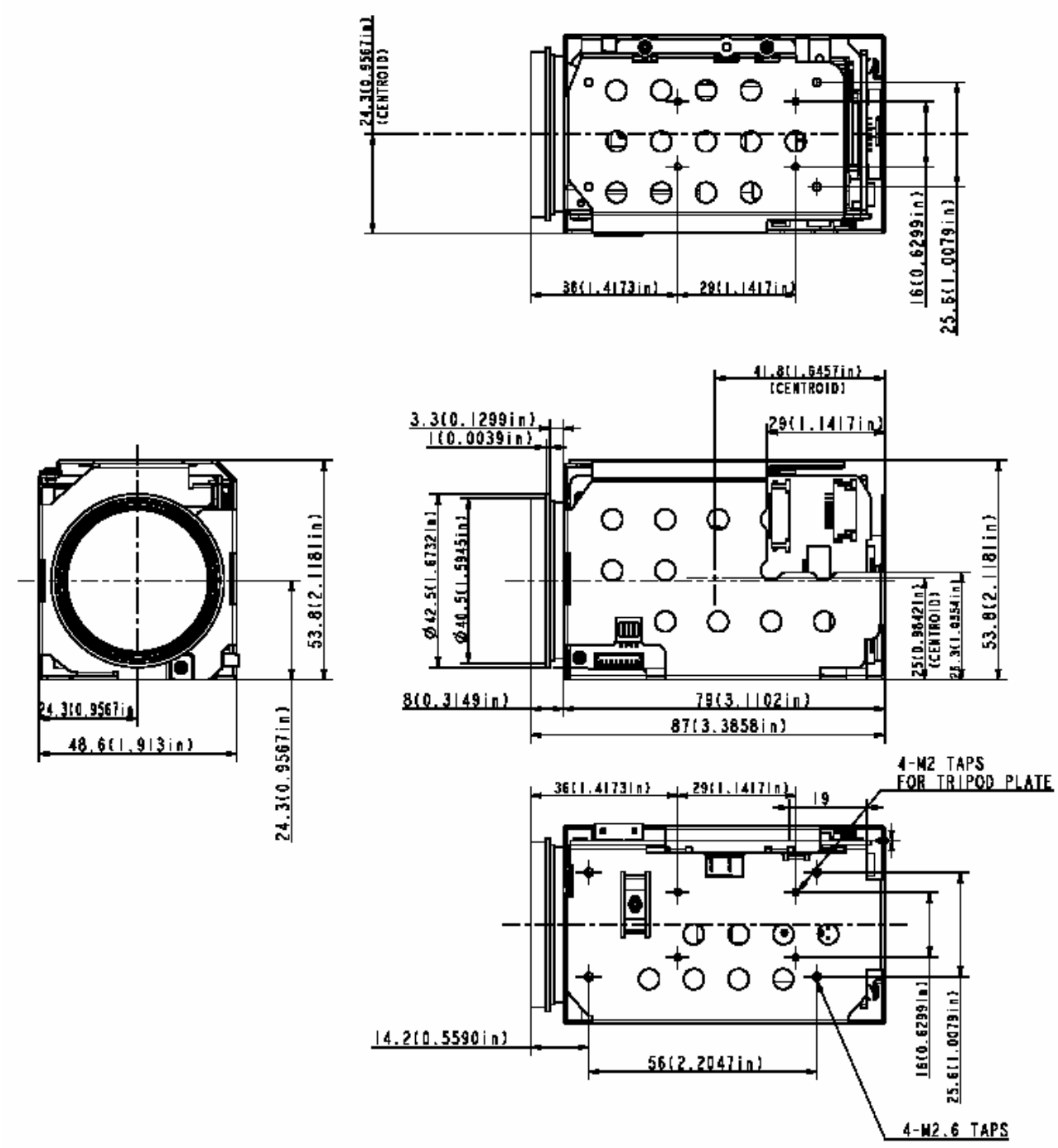
- Day & Night : 50,000 times

The failure of DAY/NIGHT operation should not happen when the function of the DAY/NIGHT is tested by the following cycle for the 50,000 times.
Motor Voltage = 5V, Frequency = 480pps



12. Mechanical Dimension

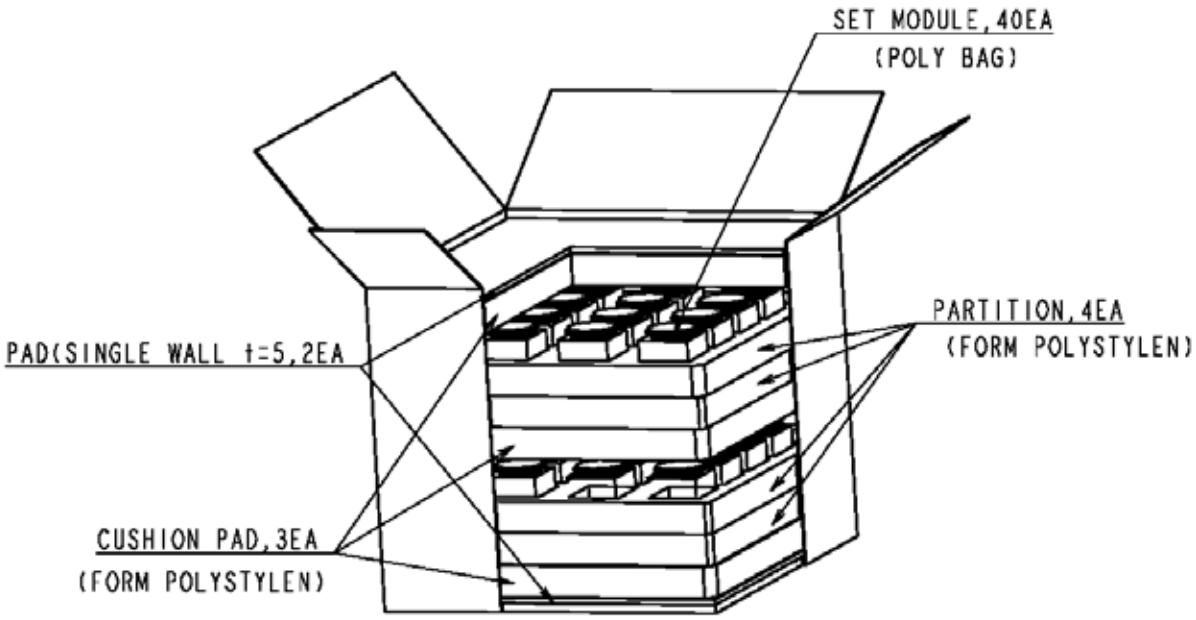
- ·Dimension (W x H x D) 48.6(W) x 53.8(H) x 87(D)mm
- ·Weight 165g
- ·Machine Serial Number Serial number is printed on ID label.



13. Package Specifications

Internal Packaging

1.PAD :SINGLE WALL(t=5)(SIZE330x380x5t)
2.CUSHION PAD :FORM POLYSTYLEN(SIZE330x380x30)
3.PARTITION :FORM POLYSTYLEN(SIZE330x380x30)
4.POLY BAG :P.E. SHEET
5.LENS CAP :P.E(t=0.5)(SIZEΦ47x4.7)
6.Number of Camera Module : 40EA.



14. Changes and Modifications of this Product Specification

- Changes or modifications of this production specifications must be submitted, in writing, for mutual consent between both parties.

- Changes and modifications to the specifications must be authorized, in writing, before such changes and modifications can be engineered.