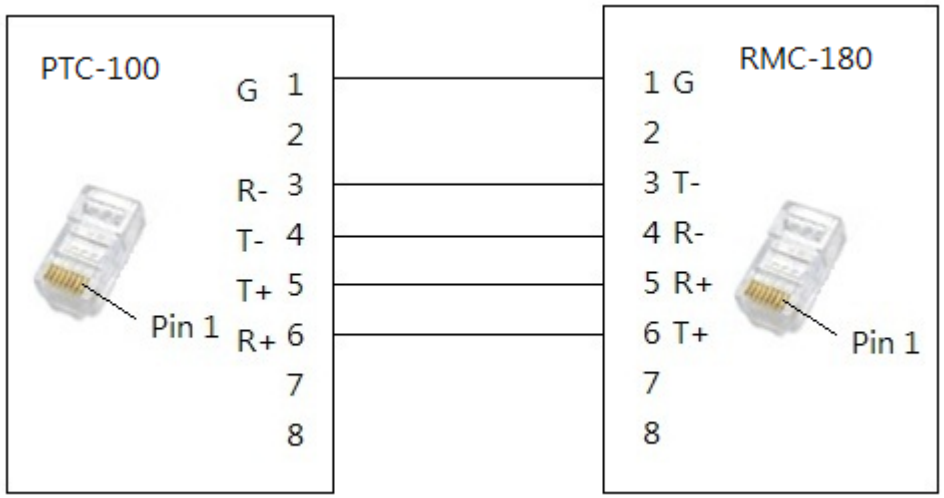
PTC-100 Protocol	Date	2014/1/9
	Author	Jack Hsiao
	Version	1.1

(1). Hardware Define



Interface = RS-422
Baudrate = 9600 bps
Data = 8-bit
Parity = None
Stop = 1-bit
Flow control = None

PTC-100 Protocol

(2). Pelco-D Protocol

Command Format :

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Synch Byte	Address	Command 1	Command 2	Data 1	Data 2	Checksum

*1 Synch Byte = 0xFF

*2 Address = 0x01 => PTC-100 bottom of 8-Pins DIP Switch as "Off,Off,Off,Off,Off,Off,Off,Off"

*3 Checksum = sum of (Byte 2 ~ Byte 6)

Response Format :

Byte 1	Byte 2	Byte 3	Byte 4
Synch Byte	Address	00	Checksum

*1 Checksum is checksum of Command code(*3)

No.	Function Name	Command Code	Detail	Description
1	P/T/Z Stop	FF 01 00 00 00 00 01		Pan/Tilt/Zoom Stop
2	Pan Left	FF 01 00 04 x1 00 CKS	x1 = 01~3F(Speed)	Pan left
3	Pan Right	FF 01 00 02 x1 00 CKS	x1 = 01~3F(Speed)	Pan right
4	Tilt Up	FF 01 00 08 00 x1 CKS	x1 = 01~3F(Speed)	Tilt up
5	Tilt Down	FF 01 00 10 00 x1 CKS	x1 = 01~3F(Speed)	Tilt down
6	Zoom In	FF 01 00 20 00 00 21		Zoom in

7	Zoom Out	FF 01 00 40 00 00 41		Zoom out
8	Zoom Speed	FF 01 00 25 00 x1 CKS	x1 = 00~03(Speed)	Zoom speed
9	Set Preset	FF 01 00 03 00 x1 CKS	x1 = 01~20(Index)	Save status to Memory
10	Clear Preset	FF 01 00 05 00 x1 CKS	x1 = 01~20(Index)	Clesa Memory
11	Go to Preset	FF 01 00 07 00 x1 CKS	x1 = 01~20(Index)	Load status form Memory
12	OSD Menu Mode	FF 01 00 03 00 5F 63		OSD Menu mode switch to On/Off
13	Go to Zero Pan	FF 01 00 07 00 00 08		
14	Set Tally Light	FF 01 00 09 00 x1 CKS	x1 = 01~03	01 : LED Off 02 : LED Red On 03 : LED Yellow On
15	Video output mirror	FF 01 00 09 00 x1 CKS	x1 = 10~12	10 : Mirror Off 11 : Mirror Horizontal 12 : Mirror Rotate
16	Camera Power	FF 01 00 09 00 x1 CKS	x1 = 20~21	20 : Shutdown 21 : Power On
17	Set AE Mode	FF 01 00 09 00 x1 CKS	x1 = 30~32	30 : AE Full Auto 31 : AE Shutter Priority 32 : AE Iris Priority
18	Color Bar	FF 01 00 09 00 x1 CKS	x1 = 40~41	40 : Color Bar Off 41 : Color Bar On
19	Video Output Format	FF 01 00 09 00 x1 CKS	x1 = 50~58	Digital Analog

				50 : 1080_59.94i NTSC 51 : 1080_50i PAL 52 : 1080_29.97p NTSC 53 : 1080_25p PAL 54 : 720_59.94p NTSC 55 : 720_50p PAL 56 : 720_29.97p NTSC 57 : 720_25p PAL
20	Remote Reset	FF 01 00 0F 00 00 10		
21	Set Pattern Stop	FF 01 00 21 00 00 22		
22	Run Pattern	FF 01 00 23 00 x1 CKS	x1 = 01~08	V(1~8)
23	Set Zoom Speed	FF 01 00 25 00 x1 CKS	x1 = 00~07	00(low), 07(high)
24	Set Focus Speed	FF 01 00 27 00 x1 CKS	x1 = 00~07	00(low), 07(high)
25	Reset Camera to defaults	FF 01 00 29 00 00 2A		
26	Set Focus Mode	FF 01 00 2B 00 x1 CKS	x1 = 00~02	00 : Auto Mode 01 : Manual Mode 02 : Push Auto Mode
27	Adjust Iris level	FF 01 00 2D 00 x1 CKS	x1 = 05~11	05 : F14 06 : F11 07 : F9.6

				08 : F8 09 : F6.8 0A : F5.6 0B : F4.8 0C : F4 0D : F3.4 0E : F2.8 0F : F2.4 10 : F2 11 : F1.6
28	Adjust AGC	FF 01 00 2F 00 x1 CKS	x1 = 00~0E	00(Dark) ~ 0E(Light)
29	Backlight compensation on/off	FF 01 00 31 00 x1 CKS	x1 = 00~01	00 : Off 01 : On
30	Adjust White Balance Mode	FF 01 00 33 00 x1 CKS	x1 = 00~02	00 : Auto Mode 01 : Manual Mode 02 : Push Auto Mode
31	Adjust Shutter Speed	FF 01 00 37 00 x1 CKS	x1 = 00~15	Note : Used only in shutter mode AE 00 : 1/1 01 : 1/2

				02 : 1/4(N) or 1/3(P) 03 : 1/8(N) or 1/6(P) 04 : 1/15(N) or 1/12(P) 05 : 1/30(N) or 1/25(P) 06 : 1/60(N) or 1/50(P) 07 : 1/90(N) or 1/75(P) 08 : 1/100 09 : 1/125(N) or 1/20(P) 0A : 1/180(N) or 1/150(P) 0B : 1/250(N) or (1/215(P) 0C : 1/350(N) or (1/300(P) 0D : 1/500(N) or (1/425(P) 0E : 1/725(N) or (1/600(P) 0F : 1/1000 10 : 1/1500(N) or (1/1250(P) 11 : 1/2000(N) or (1/1750(P) 12 : 1/3000(N) or (1/2500(P) 13 : 1/4000(N) or (1/3500(P) 14 : 1/6000 15 : 1/10000
32	Adjust White Balance Red Gain	FF 01 00 3B 00 x1 CKS	x1 = 00~FF	

33	Adjust White Balance Blue Gain	FF 01 01 3B 00 x1 CKS	x1 = 00~FF	
34	Save white balance current status	FF 01 00 3D 00 x1 CKS	x1 = 00~01	00 : Mode-A 01 : Mode-B
35	Run while balance Mode	FF 01 01 3D 00 x1 CKS	x1 = 00~01	00 : Mode-A 01 : Mode-B
36	Adjust Gain Limit	FF 01 00 3F 00 x1 CKS	x1 = 04~0F	04 : 6dB 05 : 8dB 06 : 10dB 07 : 12dB 08 : 14dB 09 : 16dB 0A : 18dB 0B : 20dB 0C : 22dB 0D : 24dB 0E : 26dB
37	Get Camera FW Version	FF 01 00 45 00 00 46		Return ASCII-Code Ex : “Ver.20120116”
38	Get Camera Identify	FF 01 01 45 00 00 47		Return ASCII-Code “PTC-100”

39	Gamma Setting	FF 01 00 47 00 x1 CKS	x1 = 00~04	00 : Standard 01 : Gamma 1 02 : S-curve-Low 03 : S-curve-Middle 04 : S-curve-High

*1 CKS = checksum

(3). Visca Protocol

Command Format :

Byte 1	Byte 2	Byte n
CA	Length	Visca command

***1 : Length = lebgth of visca command**

Privacy Zone Setting Command List

Command Set	Command	Command Packet	Comments
CAM_PrivacyZone	SetMask	CA 0A 01 04 76 mm nn 0r 0r 0s 0s FF	Setting mask(Size) See ”mm:Mask setting list”, ”nn:Setting”, and”rr:w,ss:h” in Table 1(Parameters)
	Display	CA 08 01 04 77 pp pp pp pp FF	Setting Mask Display On/Off See “pp pp pp pp: Mask bit” in Table 1(Parameters) In “Parameters pp pp pp pp: Mask setting(0OFF,1:ON)
	SetMaskColor	CA 0A 01 04 78 pp pp pp pp qq rr FF	Setting Color Mask. See “pp pp pp pp: Mask bit” and “qq”, rr:Color code” in Table 1(Parameters) qq: Color setting when setting the Mask bit to 0 rr: Color setting when setting the Mask bit to 1
	SetPanTiltAngle	CA 0A 01 04 79 0p 0p 0p 0q 0q 0q FF	Setting Pan/tilt Angle See” Setting pan/tilt angle” in Table 1(Parameters)

			ppp:Pan angle, qqq:tilt angle
	SetPTZMask	CA 0F 01 04 7B mm 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	Setting the direct position of PTZ See"mm:Mask setting list" and "Setting pan/tilt angle in Table 1(Parameters). ppp:Pan, qqq:Tilt, rrrr:Zoom
	Non_InterlockMask	CA 0D 01 04 6F mm 0p 0p 0q 0q 0r 0r 0s 0s FF	Setting non-interlocking the mask to pan tilt, See "mm:Mask setting list" and pp:x, qq:y, rr:w, ss:h" in Table 1(Parameters)
	Grid On	CA 05 01 04 7C 02 FF	Setting Grid Display On/Off
	Grid Off	CA 05 01 04 7C 03 FF	
	CenterLineOn	CA 05 01 04 7C 04 FF	Setting the center line On

Privacy Zone Inquiry Command List

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_Privacy DisplayInq	CA 04 09 04 77 FF	CA 06 50 pp pp pp pp FF	Inquiry about the status of Setting Mask Display On/Off See "pp pp pp pp: Mask bit" in Table 1(Parameters) 1:On, 0:Off
CAM_Privacy PanTiltInq	CA 04 09 04 79 FF	CA 08 50 0p 0p 0p 0q 0q 0q FF	Inquiry about the pan/tilt Position currently set See"Setting pan/tilt angle" in Table 1(Parameters). ppp: pan, qqq:Tilt
CAM_PrivacyPTZInq	CA 05 09 04 7B mm FF	CA 0C 50 0p 0p 0p 0q 0q 0q	Inquiry about the pan/tilt/zoom position at the mm Mask setting

		0r 0r 0r 0r FF	See”mm:Mask setting list” and “Setting pan/tilt angle” in Table 1(Parameters) ppp: Pan Position qqq: Tilt Position rrrr: Zoom Position
CAM_Privacy MonitorInq	CA 04 09 04 6F FF	CA 06 50 pp pp pp pp FF	Inquiry about the mask currently Displayed See “pp pp pp pp” Mask bit” in Table 1(Parameters)

VISCA Command/ACK Protocol

Command	Command Message	Reply Message	Comments
General Command	CA 05 01 04 38 02 FF (Example)	CA 03 90 41 FF(ACK)+ CA 03 90 51 FF(Completion) CA 03 90 42 FF CA 03 90 52 FF	Return ACK when a command has been accepted, and Completion when a command has been executed
	CA 04 01 04 38 FF (Example)	CA 04 90 60 02 FF(Syntax Error)	Accepted a command which is not supported or a command lacking parameters
	CA 05 01 04 38 02 FF (Example)	CA 04 90 60 03 FF (Command Buffer Full)	There are two commands currently being executed, and the command could not be accepted
	CA 05 01 04 08 02 FF (Example)	CA 04 90 61 41 FF (Command Not Executable)	Could not execute the command in the current mode

		CA 04 90 62 41 FF	
Inquiry Command	CA 04 09 04 38 FF (Example)	CA 04 90 50 02 FF (Completion)	ACK is not returned for the inquiry command
	CA 04 09 05 38 FF (Example)	CA 04 90 60 02 FF (Syntax Error)	Accepted an incompatible command
Address Set	CA 03 30 01 FF	CA 03 30 02 FF	Returned the device address to +1
IF_Clear(Broadcast)	CA 04 01 00 01 FF	CA 04 01 00 01 FF	Returned the same command
IF_Clear(For x)	CA 04 01 00 01 FF	CA 03 z0 50 FF(Completion)	ACK is not returned for this command
Command Cancel	CA 02 2y FF	CA 04 z0 6y 04 FF (Command Canceled)	Returned when the command of the socket specified is canceled. Completion for the command canceled is not returned
		CA 04 z0 6y 05 FF(No Socket)	Returned when the command of the specified socket has already Been completed or when the socket number specified is wrong

Visca Camera-Issued Messages

ACK/Completion Messages

	Command Messages	Comments

ACK	CA 03 Z0 4y FF (y:Socket No.)	Returned when the command is accepted
Completion	CA 03 z0 5y FF (y:Socket No.)	Returned when the command has been executed

Z=Device address + 8

Error Messages

	Command Messages	**Comments**
Syntax Error	CA 04 z0 60 02 FF	Returned when the command format is different or when a command with illeqal command parameters is accepted
Command Buffer Full	CA 04 z0 60 03 FF	Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received
Command Canceled	CA 04 z0 6y 04 FF	Returned when a command which is being executed in a socket specified bt the cancel command is canceled. The completion message for the command is not returned
No Socket	CA 04 z0 6y 05 FF(y:Socket No.)	Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified
Command Not Executable	CA 04 z0 6y 41 FF(y:Socket No.)	Returned when a command cannot be ewxecuted due to

		current conditions. For example, when commands controlling the focus manually are received during auto focus.

Network Change Message

	Command Messages	Comments
Network Change	CA 03 z0 38 FF	Issued when power is being routed

FCB Camera Command

Command List(1/5)

Command Set	Command	Command Packet	Comments
Address Set	Broadcast	CA 03 30 01 FF	Address setting
IF_Clear	Broadcast	CA 04 01 00 01 FF	I/F Clear
Command cancel	-	CA 02 2p FF	P:Socket No.(=1 or 2)
CAM_Power	On	CA 05 01 04 00 02 FF	Power On/Off
	Off(Standby)	CA 05 01 04 00 03 FF	
CAM_Zoom	Stop	CA 05 01 04 07 00 FF	
	Tele(Standard)	CA 05 01 04 07 02 FF	
	Wide(Standard)	CA 05 01 04 07 03 FF	
	Tele(Variable)	CA 05 01 04 07 2p FF	P=0(Low) to 7(High)
	Wide(Variable)	CA 05 01 04 07 3p FF	

	Direct	CA 08 01 04 47 0p 0q 0r 0s FF	Pqrs : Zoom Position
CAM_DZoom	On	CA 05 01 04 06 02 FF	Digital zoom ON/OFF
	Off	CA 05 01 04 06 03 FF	
	Combine Mode	CA 05 01 04 36 00 FF	Optical/ Digital Zoom Combined
	Separate Mode	CA 05 01 04 36 01 FF	Optical/Digital Zoom Separate
	Stop	CA 05 01 04 06 00 FF	
	Tele(Variable)	CA 05 01 04 06 2p FF	P=0(Low) to 7(High) *Enabled during Separate Mode
	Wide(Variable)	CA 05 01 04 06 3p FF	
	X1/Max	CA 05 01 04 06 10 FF	X1/Max Magnification Switcher *Enabled during Separate Mode
	Direct	CA 08 01 04 46 0p 0q 0r 0s FF	Pq: D-Zoom Position *Enabled during Separate Mode
CAM_Focus	Stop	CA 05 01 04 08 00 FF	
	Far(Standard)	CA 05 01 04 08 02 FF	
	Near(Standard)	CA 05 01 04 08 03 FF	
	Far(Variable)	CA 05 01 04 08 2p FF	p=0(Low) to 7(High)
	Near(Variable)	CA 05 01 04 08 3p FF	
	Direct	CA 08 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	CA 05 01 04 38 02 FF	AF ON/OFF
	Manual Focus	CA 05 01 04 38 03 FF	
	Auto/Manual	CA 05 01 04 38 10 FF	
	One Push Trigger	CA 05 01 04 18 01 FF	On Push AF Trigger

	Infinity	CA 05 01 04 18 02 FF	Forced infinity
	Near Limit	CA 08 01 04 28 0p 0q 0r 0s FF	pqrs : Focus Near Limit Position
AF Sensitivity	Normal	CA 05 01 04 58 02 FF	AF Sensitivity High/Low
	Low	CA 05 01 04 58 03 FF	
CAM_AFMode	Normal AF	CA 05 01 04 57 00 FF	AF Movement Mode
	Interval AF	CA 05 01 04 57 01 FF	
	Zoom Trigger AF	CA 05 01 04 57 02 FF	
	Active/Interval Time	CA 08 01 04 27 0p 0q 0r 0s FF	pq: Movement Time, rs: Interval
CAM_IRCorrection	Standard	CA 05 01 04 11 00 FF	FOCUS IR compensation data switching
	IR Light	CA 05 01 04 11 01 FF	
CAM_ZoomFocus	Direct	CA 0C 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM _Initialize	Lens	CA 05 01 04 19 01 FF	Lens Initialization Start
	Camera	CA 05 01 04 19 03 FF	Camera reset
CAM_WB	Auto	CA 05 01 04 35 00 FF	Normal Auto
	Indoor	CA 05 01 04 35 01 FF	Indoor mode
	Outdoor	CA 05 01 04 35 02 FF	Outdoor mode
	One Push WB	CA 05 01 04 35 03 FF	One Push WB Mode
	ATW	CA 05 01 04 35 04 FF	Auto Tracing White Balance
	Manual	CA 05 01 04 35 05 FF	Manual Control mode
	One Push Trigger	CA 05 01 04 10 05 FF	One Push Wb Trigger

	Outdoor Auto	CA 05 01 04 35 06 FF	Outdoor auto
	Sodium Lamp Auto	CA 05 01 04 35 07 FF	Auto including sodium lamp source
	Sodium Lamp	CA 05 01 04 35 08 FF	Sodium lamp source fixed mode
CAM_RGain	Reset	CA 05 01 04 03 00 FF	Manual Control of R Gain
	Up	CA 05 01 04 03 02 FF	
	Down	CA 05 01 04 03 03 FF	
	Direct	CA 08 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_BGain	Reset	CA 05 01 04 04 00 FF	Manual Control of B Gain
	Up	CA 05 01 04 04 02 FF	
	Down	CA 05 01 04 04 03 FF	
	Direct	CA 08 01 04 44 00 00 0p 0q FF	pq: B Gain
CAM_AE	Full Auto	CA 05 01 04 39 00 FF	Automatic Exposure mode
	Manual	CA 05 01 04 39 03 FF	Manual Control mode
	Shutter Priority	CA 05 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris Priority	CA 05 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	Bright	CA 05 01 04 39 0D FF	Bright Mode(Manual control)
CAM_SlowShutter	Auto	CA 05 01 04 5A 02 FF	Auto Slow Shutter ON/OFF
	Manual	CA 05 01 04 5A 03 FF	
CAM_Shutter	Reset	CA 05 01 04 0A 00 FF	Shutter Setting

	Up	CA 05 01 04 0A 02 FF	
	Down	CA 05 01 04 0A 03 FF	
	Direct	CA 08 01 04 4A 00 00 0p 0q FF	pq: Shutter Position in Table 3
CAM_Iris	Reset	CA 05 01 04 0B 00 FF	Iris Setting
	Up	CA 05 01 04 0B 02 FF	
	Down	CA 05 01 04 0B 03 FF	
	Direct	CA 08 01 04 4B 00 00 0p 0q FF	pq: Iris Position in Table 2

CAM_Shutter	Reset	CA 05 01 04 0C 00 FF	Gain Setting
	Up	CA 05 01 04 0C 02 FF	
	Down	CA 05 01 04 0C 03 FF	
	Direct	CA 08 01 04 4C 00 00 0p 0q FF	pq: Gain Position
	Gain Limit	CA 06 01 04 2C 0p FF	p: Gain Position
CAM_Bright	Reset	CA 05 01 04 0D 00 FF	Bright Setting
	Up	CA 05 01 04 0D 02 FF	
	Down	CA 05 01 04 0D 03 FF	
	Direct	CA 08 01 04 4D 00 00 0p 0q FF	pq: Bright Position
CAM_ExpComp	On	CA 05 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	CA 05 01 04 3E 03 FF	
	Reset	CA 05 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	CA 05 01 04 0E 02 FF	
	Down	CA 05 01 04 0E 03 FF	

	Direct	CA 08 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position in Table 4
CAM_BackLight	On	CA 05 01 04 33 02 FF	Back Light Compensation ON/OFF
	Off	CA 05 01 04 33 03 FF	
CAM_SpotAE	On	CA 05 01 04 59 02 FF	Spot Automatic Exposure Setting
	Off	CA 05 01 04 59 03 FF	
	Position	CA 08 01 04 29 0p 0q 0r 0s FF	pq: X(0 to F), rs: Y(0 to F)
CAM_AE_Response	Direct	CA 05 01 04 5D pp FF	pp: Automatic Exposure Response Setting(01 to 30) default value : 01
CAM_WD	On	CA 05 01 04 3D 02 FF	Wide: D ON/OFF
	Off	CA 05 01 04 3D 03 FF	
	AutoOnOff	CA 05 01 04 3D 00 FF	Wide dynamic ON/OFF auto switching
	On(Ratio Fix)	CA 05 01 04 3D 01 FF	Wide dynamic ON (Fixed exposure ratio mode)
	On(Dver Compati)	CA 05 01 04 3D 04 FF	Wide dynamic ON (Dver operation)
	Set Parameter	CA 0C 01 04 2D 0p 0q 0r 0s 0t 0u 00 00 FF	p: Screen display 0: Combined image, 2:Long-time, 3: Short-time

			q: Detection sensitivity (0:L, 1:M, 2:H) r: Blocked-up shadow correction Level(0:L, 1:M, 2:H) s: Blown-out hightlight correction level(0:L, 1:M, 2:H) tu: Exposure ratio of short exposure(x1 to x64)
CAM_WDAlarmReply	On	CA 05 01 04 3B 02 FF	Wide dynamic auto switching alarm ON/OFF
	Off	CA 05 01 04 2B 03 FF	
	(Reply)	CA 06 y0 07 04 3B 02 FF	Wide dynamic OFF->ON
		CA 06 y0 07 04 3B 03 FF	Wide dynamic ON/OFF
CAM_Aperture	Reset	CA 05 01 04 02 00 FF	Aperture Control
	Up	CA 05 01 04 02 02 FF	
	Down	CA 05 01 04 02 03 FF	
	Direct	CA 08 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_HR	On	CA 05 01 04 52 02 FF	High-Resolution Mode ON/OFF
	Off	CA 05 01 04 52 03 FF	
CAM_NR	--	CA 05 01 04 53 0p FF	p: NR Setting(0:OFF, level 1 to 5)
CAM_Gamma	--	CA 05 01 04 5B 0p FF	p: Gamma setting (0: Standard, 1 to 4)
CAM_HighSensitivity	On	CA 05 01 04 5E 02 FF	High Sensitivity mode ON/OFF

	Off	CA 05 01 04 5E 03 FF	
CAM_LR_Reverse	On	CA 05 01 04 61 02 FF	Mirror Image ON/OFF
	Off	CA 05 01 04 61 03 FF	
CAM_Freeze	On	CA 05 01 04 62 02 FF	Still Image ON/OFF
	Off	CA 05 01 04 62 03 FF	
CAM_PictureEffect	Off	CA 05 01 04 63 00 FF	Picture Effect Setting
	Neg-Art	CA 05 01 04 63 02 FF	
	B&W	CA 05 01 04 63 04 FF	
CAM_PictureFlip	On	CA 05 01 04 66 02 FF	Picture flip ON/OFF
	Off	CA 05 01 04 66 03 FF	
CAM_ICR	On	CA 05 01 04 01 02 FF	Infrared Mode ON/OFF
	Off	CA 05 01 04 02 03 FF	
CAM_AutoICR	On	CA 05 01 04 51 02 FF	Auto dark-field mode On/Off
	Off	CA 05 01 04 51 03 FF	
	Threshold	CA 08 01 04 21 00 00 0p 0q FF	pq: ICR ON -> OFF Threshold Level
CAM_AutoICRAlarmReply	On	CA 05 01 04 31 02 FF	Auto ICR switching Alarm On/OFF
	Off	CA 05 01 04 31 03 FF	
	(Reply)	CA 06 y0 07 04 31 02 FF	ICR OFF->ON
		CA 06 yY0 07 04 31 03 FF	ICR ON->OFF
CAM_Memory	Reset	CA 06 01 04 3F 00 0p FF	p: Memory Number(=0 to 5)
	Set	CA 06 01 04 3F 01 0p FF	

	Recall	CA 06 01 04 3F 02 0p FF	
CAM_CUSTOM	Reset	CA 06 01 04 3F 00 7F FF	Strats up in this mode when the power is turned on.
	Set	CA 06 01 04 3F 01 7F FF	
	Recall	CA 06 01 04 3F 02 7F FF	
CAM MemSave	Write	CA 09 01 04 23 0X 0p 0p 0q 0q FF	X: 00 to 07(Address), total 16 bytes ppqq: 0x0000 to 0xFFFF(Data)
CAM Display	On	CA 05 01 04 15 02 FF (CA 05 01 06 06 02 FF)	Display ON/OFF
	Off	CA 05 01 04 15 03 FF (CA 05 01 06 06 03 FF)	
	On/Off	CA 05 01 04 15 10 FF (CA 05 01 06 06 10 FF)	
	Title Set1	CA 0F 01 04 73 1L 00 nn pp qq 00 00 00 00 00 00 FF	L: Line Number, nn: H-Position Pp:Color, qq: Blank
	Title Set2	CA 0F 01 04 73 2L mm nn pp qq rr ss tt uu vv ww FF	L: Line Number Mnpqrstuvw: Setting of characters(1 to 10)
	Title Set3	CA 0f 01 04 73 3L mm nn pp qq rr ss tt	L:Line Number mnpqrstuvw: Setting of

		uu vv ww FF	characters(1 to 10)
	Title Clear	CA 05 01 04 74 1p FF	Title Setting clear(p: 0 to a, f=all lines)
	On	CA 05 01 04 74 2p FF	Title display On/Off(0 to a, F=all lines)
	Off	CA 05 01 04 74 3p FF	
CAM_Mute	On	CA 05 01 04 75 02 FF	Mute ON/OFF
	Off	CA 05 01 04 75 03 FF	
	On/Off	CA 05 01 04 75 10 FF	
CAM_PrivacyZone	SetMask	CA 0A 01 04 76 mm nn 0r 0r 0s 0s FF	mm: Mask Settings nn (00: Modify, 01:New) rr:W, ss:H
	Display	CA 08 01 04 77 pp pp pp pp FF	Mask Display ON/OFF pp pp pp pp : Mask Setting (0:OFF, 1:ON)
	SetMaskColor	CA 0A 01 04 78 pp pp pp pp qq rr FF	pp pp pp pp : Mask Color Settings qq: Color Setting when 0 is selected rr : Color Setting When 1 is selected
	SetPanTiltAngle	CA 0A 01 04 79 0p 0p 0p 0q 0q 0q FF	Pan/Tilt Angle Settings ppp: Pan qqq: Tilt

	SetPTZMask	CA 0E 01 04 7B mm 0p 0p 0p 0q 0q 0q 0r 0r 0r FF	Pan/Tilt/Zoom Settings for Mask ppp: Pan qqq: Tilt rrrr: Zoom
	Non_InterlockMask	CA 0D 01 04 6F mm 0p 0p 0q 0q 0r 0r 0s 0s FF	mm: Non_Interlock Mask Settings Pp:X, q:Y, rr:W, ss:H
	GridOn	CA 05 01 04 7C 02 FF	Grid Display ON/OFF
	Grid Off	CA 05 01 04 7C 02 FF	Grid/Center Line Display Off
	CenterLineOn	CA 05 01 04 7C 04 FF	Center Line Display On
CAM_IDWrite	--	CA 08 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID(=0000 to FFFF)
CAM_Alarm	On	CA 05 01 04 6B 02 FF	Alarm ON/OFF
	Off	CA 05 01 04 6B 03 FF	
	SetMode	CA 05 01 04 6C pp FF	pp: Mode setting 00 Focus change detection (reference value is not updated) 01 Focus change detection (reference value is updated) 02 AE change detection (reference value is not updated) 03 AE change detection

			(reference value is updated)
	SetDayNightLevel	CA 0A 01 04 6D 0p 0p 0p 0q 0q 0q FF	ppp: Day judgement level setting qqq: Night judgement level setting
	Alarm(Reply)	CA 05 07 04 6B 01 FF	Detection level ”Low” -> “High”
		CA 05 07 04 6b 00 FF	Detection level ”High” -> “Low”
CAM_MD	On	CA 05 01 04 1B 02 FF	Motion Detection On/Off
	Off	CA 05 01 04 1B 03 FF	
	Function Set	CA 0A 01 04 1C 0m 0n 0p 0q 0r 0s FF	m: Display mode n : Detection Frame Set(0 to F) pq : Threshold Level(00 to FF) rs : Interval Time Set(00 to FF)
	Window Set	CA 09 01 04 1D 0m 0p 0q rr 0s FF	m: Select Detection Frame(0,1,2,3) p : Start Horizontal Position (00 to 0F) q : Start Vertical Position (00 to 07) rr : Stop Horizontal Position (01 to 10)

			s : Stop Vertical Position (01 to 08)
	Alarm(Reply)	CA 05 07 04 1B 0p FF	p: Detection Frame Number
CAM_ContinuousZoomPosReply	On	CA 05 01 04 69 02 FF	Zoom Position data Continuous Output On/Off
	Off	CA 05 01 04 69 03 FF	
	Relpy	CA 0A 07 04 69 0p 0p 0q 0q 0q 0q FF	pp: D-Zoom Position (00 : When Zoom Mode is Combine) qqqq: Zoom Position
CAM_ReplyIntervalTimeSet	--	CA 08 01 04 6A 00 00 0p 0p FF	pp: Interval Time [Vertical timing]
CAM_ReqisterValue	--	CA 07 01 04 24 mm 0p 0p FF	mm: Register No.(=00 ~ 7F) pp:Register Value(=00 ~7F)
	Parameter Set	CA 09 01 04 20 mm nn pp qq rr FF	mm: First byte from the top threshold value nn: Second byte from the top threshold value pp: Third byte from the top threshold value qq: Color specification for high-intensity rr : Color specification for low-intensity Range for mm,nn,and pp is 0 to E

			Range for qq and rr is 0 to 8 Colors 0:Yellow, 1:Cyan, 2:Green, 3:White, 4: Magenta, 5:Red, 6:Blue, 7:Black, 8: Gray
	On	CA 05 01 04 50 02 FF	Color Enhancement ON/OFF
	Off	CA 05 01 04 50 03 FF	
CAM_ChromaSuppress		CA 05 01 04 5F pp FF	pp: Chroma Suppress setting level 00: OFF 1 to 3 : ON(3 levels) Effect increases as the level number increases
CAM_ColorGain	Direct	CA 07 01 04 49 00 00 00 0p FF	p : Color Gain setting 0h(60%) to Eh(200%)
CAM_ColorHue	Direct	CA 07 01 04 4F 00 00 00 0p FF	p : Color Hue setting 0h (-14 degrees) to Eh(+14 degress)

Inquiry Command List

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	CA 04 09 04 00 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off(Standby)
CAM_ZoomPosInq	CA 04 09 04 47 FF	CA 06 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_DZoomModeInq	CA 04 09 04 06 FF	CA 03 50 02 FF	D-Zoom On
		CA 03 50 03 FF	D-Zoom Off
CAM_DZoomC/SModeInq	CA 04 09 04 36 FF	CA 03 50 00 FF	Combine Mode
		CA 03 50 01 FF	Separate Mode
CAM_DZoomPosInq	CA 04 09 04 46 FF	CA 06 50 00 00 0p 0q FF	pq: D-Zoom Position
CAM_FocusModeInq	CA 04 09 04 38 FF	CA 03 50 02 FF	Auto Focus
		CA 03 50 03 FF	Manual Focus
CAM_FocusPosInq	CA 04 09 04 48 FF	CA 06 50 0p 0q 0r 0s FF	pqrs: Focus Position

CAM_FocusNearLimitInq	CA 04 09 04 28 FF	CA 06 50 0 p0 0q 0r 0s FF	pqrs: Focus Near Limit Position
CAM_AFSensitivityInq	CA 04 09 04 58 FF	CA 03 50 02 FF	AF Sensitivity Normal
		CA 03 50 03 FF	AF Sensitivity Low
CAM_AFModeInq	CA 04 09 05 57 FF	CA 03 50 00 FF	Normal AF
		CA 03 50 01 FF	Interval AF
		CA 03 50 02 FF	Zoom Trigger AF
CAM_AFTimeSettingInq	CA 04 09 04 27 FF	CA 06 50 0p 0q 0r 0s FF	pq: Movement Time, rs:Interval
CAM_IRCorrectionInq	CA 04 09 04 11 FF	CA 03 50 02 FF	Standard
		CA 03 50 03 FF	IR Light
CAM_WBModeInq	CA 04 09 04 35 FF	CA 03 50 00 FF	Auto
		CA 03 50 01 FF	In Door
		CA 03 50 02 FF	Out Door
		CA 03 50 03 FF	One Push WB
		CA 03 50 04 FF	ATW
		CA 03 50 05 FF	Manual
		CA 03 50 06 FF	Outdoor Auto
		CA 03 50 07 FF	Sodium Lamp Auto
		CA 03 50 08 FF	Sodium Lamp
CAM_RGainInq	CA 04 09 04 43 FF	CA 06 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	CA 04 09 04 44 FF	CA 06 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	CA 04 09 04 39 FF	CA 03 50 00 FF	Full Auto

		CA 03 50 03 FF	Manual
		CA 03 50 0A FF	Shutter Priority
		CA 03 50 0B FF	Iris Priority
		CA 03 50 0D FF	Bright
CAM_SlowShutterModeInq	CA 04 09 04 5A FF	CA 03 50 02 FF	Auto
		CA 03 50 03 FF	Manual
CAM_ShutterPosInq	CA 04 09 04 4A FF	CA 06 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	CA 04 09 04 4B FF	CA 06 50 00 00 0p 0q FF	pq: Iris Position
CAM_GainPosInq	CA 04 09 04 4C FF	CA 06 50 00 00 0p 0q FF	pq: Gain Position
CAM_GainLimitInq	CA 04 09 04 2C FF	CA 03 50 0q FF	p: Gain Limit
CAM_BrightPosInq	CA 04 09 04 4D FF	CA 06 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCompModeInq	CA 04 09 04 3E FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_ExpCompPosInq	CA 04 09 04 4E FF	CA 06 50 00 00 0p 0q FF	pq: ExpComp Position in Table 4
CAM_BackLightModeInq	CA 04 09 04 33 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_SpotAEModeInq	CA 04 09 04 59 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_SpotAEPosInq	CA 04 09 04 29 FF	CA 03 50 0p 0q 0r 0s FF	pq: X position, rs: Y position
CAM_AE_ResponseInq	CA 04 09 04 5D FF	CA 03 50 pp FF	pp: 01 to 20 (hex)
CAM_WDModeInq	CA 04 09 04 3D FF	CA 03 50 02 FF	On Wide-D
		CA 03 50 03 FF	Off

		CA 03 50 00 FF	Auto OnOff
		CA 03 50 01 FF	On(Ratio Fix)
		CA 03 50 04 FF	On(Dver operation)
CAM_WDParameterInq	CA 04 09 04 2D FF	CA 0A 50 0p 0q 0r 0s 0t 0u 00 00 FF	p : Screen display q : Detection sensitivity r: Blocked-up shadow correction level s : Blown-out highlight correction level tu : Exposure ratio of short exposure
CAM_WDAlarmReplyInq	CA 04 09 04 3B FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_ApertureInq	CA 04 09 04 42 FF	CA 06 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_HRModeInq	CA 04 09 04 52 FF	CA 03 50 02 FF	On(Hi-Resolution)
		CA 03 50 03 FF	Off
CAM_NRModeInq	CA 04 09 04 53 FF	CA 03 50 0p FF	Noise Reduction p:0 to 5

CAM_GammaInq	CA 04 09 04 5B FF	CA 03 50 0p FF	Gamma p:0 to 4
CAM_HighSensitivityInq	CA 04 09 04 5E FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_LR_ReverseModeInq	CA 04 09 04 61 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_FreezeModeInq	CA 04 09 04 62 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_PictureEffectModeInq	CA 04 09 04 63 FF	CA 03 50 00 FF	Off
		CA 03 50 02 FF	Neg-Art
		CA 03 50 04 FF	B&W
CAM_PictureFlipModeInq	CA 04 09 04 66 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_ICRModeInq	CA 04 09 04 01 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_AutoICRModeInq	CA 04 09 04 51 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_AutoICRThresholdInq	CA 04 09 04 21 FF	CA 06 50 00 00 0p 0q FF	pq: ICR ON -> OFF Threshold Level
CAM_AutoICRAlarmReplyInq	CA 04 09 04 31 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_MemoryInq	CA 04 09 04 3F FF	CA 03 50 pp FF	pp: Memory number recalled last

CAM_MemSaveInq	CA 05 09 04 23 0X FF	CA 06 50 0p 0p 0q 0q FF	X: 00 to 07 (Address) Ppqq:0x0000 to 0xFFFF(Data)
CAM_DisplayModeInq	CA 04 09 04 15 FF (CA 04 09 06 06 FF)	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_MuteModeInq	CA 04 09 04 75 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_PrivacyDisplayInq	CA 04 09 04 77 FF	CA 06 50 pp pp pp pp FF	pp pp pp pp : Mask Display(0:OFF,1:ON)
CAM_PrivacyPanTiltInq	CA 04 09 04 79 FF	CA 08 50 0p 0p 0p 0q 0q 0q FF	ppp: Pan qqq: Tilt
CAM_PrivacyPTZInq	CA 05 09 04 7B mm FF	CA 0C 50 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	mm : Mask Settings ppp : Pan qqq : Tilt rrrr : Zoom
CAM_PrivacyMonitorInq	CA 04 09 04 6F FF	CA 06 50 pp pp pp pp FF	Pp pp pp pp : Mask is displayed now
CAM_KeyLockInq	CA 04 09 04 17 FF	CA 03 50 00 FF	Off
		CA 03 50 02 FF	On
CAM_IDInq	CA 04 09 04 22 FF	CA 06 50 0p 0q 0r 0s FF	Pqrs : Camera ID
CAM_VersionInq	CA 04 09 00 02 FF	CA 09 50 00 20 mn pq rs tu vw FF	mnpq: Model Code(04xx) rstu: ROM version vw: Socket Number(=02)

CAM_AlarmInq	CA 04 09 04 6B FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_AlarmModeInq	CA 04 09 04 6C FF	CA 03 50 pp FF	pp : Alarm Mode
CAM_AlarmDayNightLevelInq	CA 04 09 04 6D FF	CA 0B 50 0p 0p 0p 0q 0q 0q 0r 0r 0r FF	ppp: Day judgement level setting qqq: Night judgement level setting rrr: Current Automatic Exposure level setting
CAM_AlarmDetectLevelInq	CA 04 09 04 6E FF	CA 03 50 01 FF	Detection level “High”
		CA 03 50 00 FF	Detection level “Low”
CAM_MDModeInq	CA 04 09 04 1B FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_MDFunctionInq	CA 04 09 04 1C FF	CA 06 50 0m 0n 0p 0q FF	m: Display mode n: Detection Frame Set(0 to F) pq: Threshold Level (0 to FF) rs: Interval Time set(0 to FF)
CAM_MDWindowInq	CA 05 09 04 1D 0m FF	CA 06 50 0p 0q 0r 0s FF	m: Select Detection Frame (0,1,2,3) p: Start Horizontal Position (00 to 0B) q: Start Vertical Position (00 to 07)

			r: Stop Horizontal Position (01 to 0C) s: Stop Vertical Position(01 to 08)
CAM_ContinuousZoomPos ReplyModeInq	CA 04 09 04 69 FF	CA 03 50 02 FF	On
		CA 03 50 03 FF	Off
CAM_ReplyIntervalTimeInq	CA 04 09 04 6A FF	CA 06 50 00 00 0p 0p FF	pp: Interval Time
CAM_RegisterValueInq	CA 05 09 04 24 mm FF	CA 04 50 0p 0p FF	mm: Register No. (00 to 7F) pp : Register Value (00 to FF)
CAM_ColorEnhanceInq	CA 04 09 04 20 FF	CA 07 50 mm nn pp qq rr FF	mm: First byte from the top threshold value nn : Second byte form the top threshold value pp : Third byte from the top threshold value qq : Color specification for high-intensity rr : Color specification for low-intensity Colors 0: Yellow, 1: Cyan, 2:Green, 3: White, 4: Magenta, 5:Red, 6:Blue, 7:Black, 8:Gray
	CA 04 09 04 50 FF	CA 03 50 02 FF	On

		CA 03 50 03 FF	Off
CAM_ChromaSuppressInq	CA 04 09 04 5F FF	CA 03 50 pp FF	pp : Chroma Suppress setting level
CAM_ColorGainInq	CA 04 09 04 49 FF	CA 06 50 00 00 00 0p FF	p: Color Gain setting 0h(60%) to Eh(200%)
CAM_ColorHueInq	CA 04 09 04 4F FF	CA 06 50 00 00 00 0p FF	p: Color Hue setting 0h(-14 degrees) to Eh(+14 degrees)
CAM_TempInq	CA 04 09 04 68 FF	CA 06 50 00 00 0p 0q FF	pq : Temperature *Lens temperature

Table 1 (Parameters) :

mm: Mask setting list

Mask Name	mm (Hex)		Mask Name	mm(Hex)
Mask_A	00h		Mask_M	0Ch
Mask_B	01h		Mask_N	0Dh
Mask_C	02h		Mask_O	0Eh
Mask_D	03h		Mask_P	0Fh
Mask_E	04h		Mask_Q	10h
Mask_F	05h		Mask_R	11h
Mask_G	06h		Mask_S	12h
Mask_H	07h		Mask_T	13h
Mask_I	08h		Mask_U	14h

Mask_J	09h		Mask_V	15h
Mask_K	0Ah		Mask_W	16h
Mask_A	0Bh		Mask_X	17h

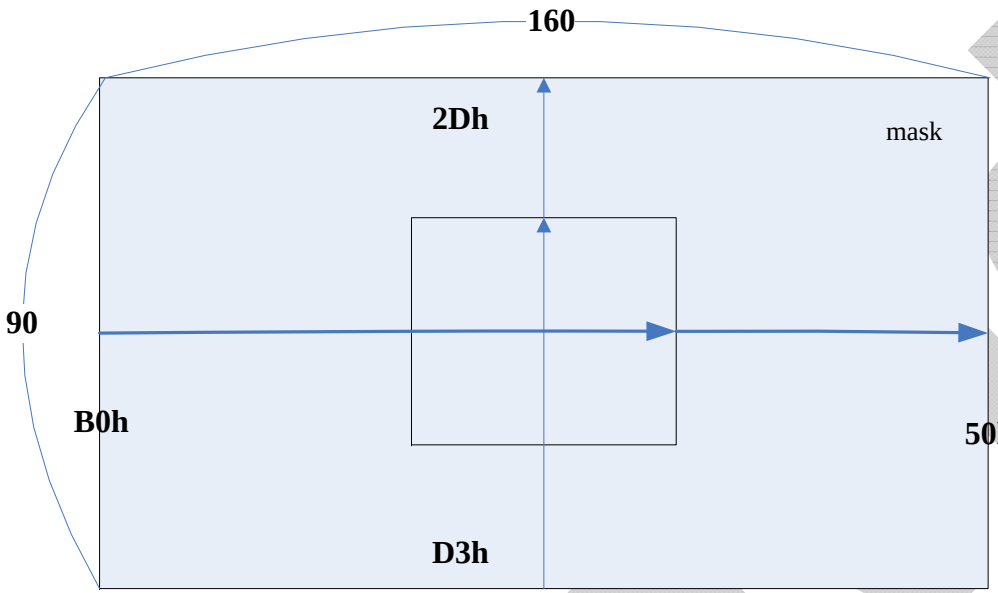
Note : The priority order of the mask display is in the sequence from A(hight) to X(lowest)

When you set the parameters of masks non-sequentially, it is recommended that you set the Mask whose priority order is higher, first.

nn: Setting

nn	Settting
00	Resetting the zone size(the value of w,h) for the existing mask
01	Setting newly the zone size(the value of w,h)

pp:x, qq:y, rr:w, ss:h



Effective display area

pp pp pp pp : Mask bit

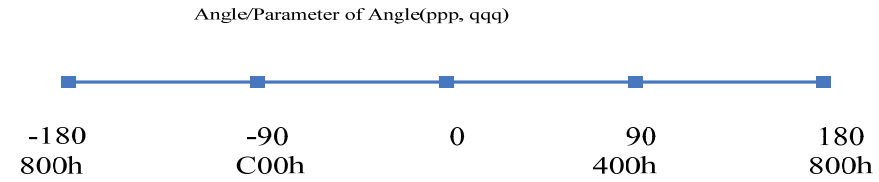
	pp								pp								pp								pp							
bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Mask	-	-	X	W	V	U	T	S	-	-	R	Q	P	O	N	M	-	-	L	K	J	I	H	G	-	-	F	E	D	C	B	A

The “-“ must be “0”

qq, rr: Color code

Mask(Color)	Code(qq,rr)
Black	00h
Gray1	01h
Gray2	02h
Gray3	03h
Gray4	04h
Gray5	05h
Gray6	06h
White	07h
Red	08h
Green	09h
Blue	0Ah
Cyan	0Bh
Yellow	0Ch
Magenta	0Dh

Setting pan/tile angle



Set the angle resolution to 360 (degree)/4096(1000h).

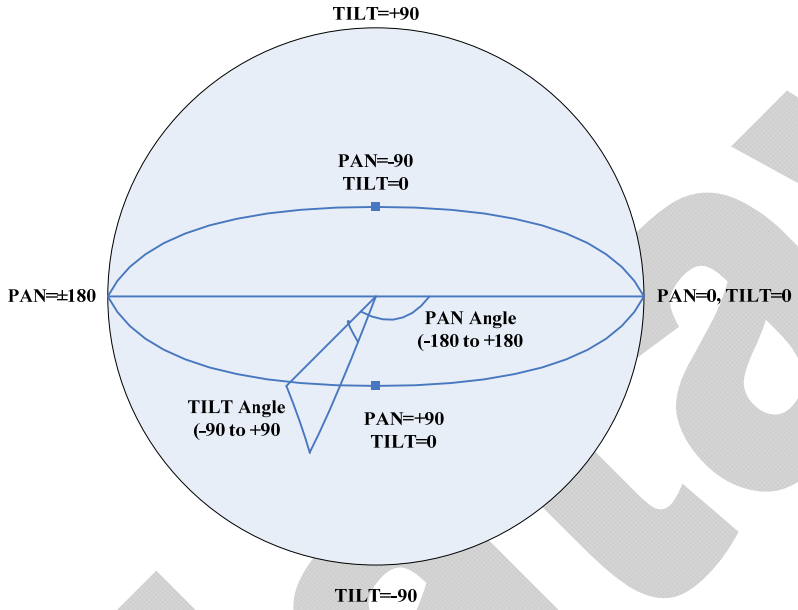


Table 2 (Iris Setting)

Data	Setting value
11	F1.6
10	F2
0F	F2.4
0E	F2.8
0D	F3.4
0C	F4
0B	F4.8
0A	F5.6
09	F6.8
08	F8
07	F9.6
06	F11
05	F14
00	CLOSE

Table 3 (Shutter Setting)

Data	60/30 mode	50/25 mode
15	1/10000	1/10000
14	1/6000	1/6000
13	1/4000	1/3500
12	1/3000	1/2500
11	1/2000	1/1750
10	1/1500	1/1250
0F	1/1000	1/1000
0E	1/725	1/600
0D	1/500	1/425
0C	1/350	1/300
0B	1/250	1/215
0A	1/180	1/150
09	1/125	1/120
08	1/100	1/100
07	1/90	1/75
06	1/60	1/50
05	1/30	1/25
04	1/15	1/12
03	1/8	1/6
02	1/4	1/3
01	1/2	1/2

00	1/1	1/1

Table 4 (Exposure Compensation)

Data	Step	Setting value
0E	+7	+10.5 dB
0D	+6	+9 dB
0C	+5	+7.5 dB
0B	+4	+6 dB
0A	+3	+4.5 dB
09	+2	+3 dB
08	+1	+1.5 dB
07	0	0 dB
06	-1	-1.5 dB
05	-2	-3 dB
04	-3	-4.5 dB
03	-4	-6 dB
02	-5	-7.5 dB
01	-6	-9 dB
00	-7	-10.5 dB