



# VC-A20P\_VC-A202P

## RS-232 command set

No	Issue Date	Description	Apply Firmware
1	2014/09/22	First version.	VCT101
2	2014/11/24	Add VC-A202P which has same command set with VC-A20P	NA
3	2015/04/07	Add 17. RS232 over IP	VCT107
4	2015/05/14	1. Delete command: Power_LoadState/Power_LoadStateInq 2. Add Command: Pan/Tilt Speed table setting/ VISCA Camera command Table	VCT111
5	2015/11/12	1. Add Iris and Iris limit Table 2. Revise Optical Zoom & Focus range 3. Add Command: 3.1 Smooth Auto 3.2 CAM_SET_ETHERNET_DHCP 3.3 CAM_HARDWARE_FACTORY_RESET 3.4 CAM_MSDC_RESET 4. Revise Command: 4.1 CAM_WB_RGAIN: add range 4.2 CAM_WB_BGAIN: add range 4.3 AF SensitivityInq: correct the description	VCT119
6	2016/09/06	Add 20.9-21.14 for the communication method of VISCA over IP	NA
7	2016/12/28	Revise the Shutter Table	VCT129


**\*Notice:**

1. The RS-232 command list is for VC-A20P/ VC-A202P.
2. The yellow highlight  means the latest update.
3. The blue highlight  means the deleted item.

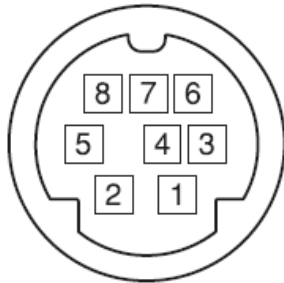
### 1. Communication Protocol

Transmit Method: Asynchronous Interface Half Duplex Serial Communication

- Transmit Speed: 9600bps or 38400bps
- Start bit: 1Bit
- Parity Check: NA
- Data Bit: 8Bit
- Stop Bit: 1Bit

### 2. The wire diagram

The RS232 wire diagram between presenter and remote controller as below



No	Pins
1	DTR IN
2	DSR IN
3	TXD IN
4	GND
5	RXD IN
6	GND

### 3. ACK & Completion message

	Reply Packet	Note
Ack	X0 4Y FF	Y = socket number
Completion (commands)	X0 5Y FF	Y = socket number
Completion (Inquiries)	X0 5Y ... FF	Y = socket number

X = 9 to F==>camera address + 8 , Y=1 to 2

#### 4. Error message

Error Packet	Description
X0 60 02 FF	Syntax Error
X0 60 03 FF	Command buffer full
X0 6Y 04 FF	Command cancelled
X0 6Y 05 FF	No socket (to be cancelled)
X0 6Y 41 FF	Command not executable
X = 9 to F==>camera address + 8	
Y = socket number, Y=0 to 2, 0: Inquiry not execution	

#### 5. Command execution cancel

	Cancel Packet	Note
Cancel	8X 2Y FF	Y = socket number
X = 1 to 7==>camera address, Y = socket number, Y=1 to 2		

#### 6. Network Change

	Packet	Note
Address	88 30 01 FF	Always broadcasted
Network Change	X0 38 FF	
X = 9 to F==>camera address + 8		

#### 7. IF\_Clear

	Command	Reply Packet Note
IF_Clear	8X 01 00 01 FF	X0 50 FF
IF_Clear (broadcast)	88 01 00 01 FF	88 01 00 01 FF
X = 1 to 7==>camera address (For inquiry packet)		
X = 9 to F==>camera address +8 (For reply packet)		

## 8. Zoom Focus Position Table

Zoom Position	Wide end	Optical	Digital	
	0x0000	to	0x4000	NULL
Focus Position	Far end		Near end	
	0x000	to	0x102	pqrs:0x000 ~ 0x102

## 9. Optical Zoom Position Table

Optical Zoom Ratio	pqrs
x1	0x0000
x2	0x1C2B
x3	0x27A9
x4	0x2EC2
x5	0x33B7
x6	0x378C
x7	0x3A97
x8	0x3D12
x9	0x3EDF
x10	0x4000

## 10. Digital Zoom Position Table

Digital Zoom Ratio	pq
x1	NULL
x2	NULL
x3	NULL
x4	NULL
x5	NULL
x6	NULL
x7	NULL
x8	NULL
x9	NULL
x10	NULL
x11	NULL
x12	NULL

## 11. AE\_Shutter Table

Shutter Speed	Index(pq)	60/30 mode	50/25 mode
	0x15	1/10000	1/10000
	0x14	1/5000	1/5000
	0x13	1/3000	1/3000
	0x12	1/2500	1/2500
	0x11	1/2000	1/1750
	0x10	1/1500	1/1250
	0x0F	1/1000	1/1000
	0x0E	1/725	1/600
	0x0D	1/500	1/425
	0x0C	1/350	1/300
	0x0B	1/250	1/215
	0x0A	1/180	1/150
	0x09	1/120	1/120
	0x08	1/100	1/100
	0x07	1/90	1/75
	0x06	1/60	1/50
	0x05	1/30	1/25
	0x04	1/15	1/12
	0x03	1/8	1/6
0x02	1/4	1/3	
0x01	1/2	1/2	
0x00	1/1	1/1	

## 12. AE\_Iris Table

	Index(pq)	Value
<b>Iris</b>	0x0E	F 1.8
	0x0D	F 2.1
	0x0C	F 2.5
	0x0B	F 3.0
	0x0A	F 3.6
	0x09	F 4.3
	0x08	F 5.1
	0x07	F 6.1
	0x06	F 7.2
	0x05	F 8.6
	0x04	F 10.2
	0x03	F 12.1
	0x02	F 14.4
	0x01	F 17.1
	0x00	F 20.4



### 13. AE\_Iris Limit Table

	Index(pq)	Value
Iris	0x07	F 1.8
	0x06	F 2.5
	0x05	F 3.6
	0x04	F 5.1
	0x03	F 7.2
	0x02	F 10.2
	0x01	F 14.4
	0x00	F 20.4

#### 14. AE\_Gain Table

Gain	Index(pq)	Value
	0x0F	+30 dB
	0x0E	+28 dB
	0x0D	+26 dB
	0x0C	+24 dB
	0x0B	+22 dB
	0x0A	+20 dB
	0x09	+18 dB
	0x08	+16 dB
	0x07	+14 dB
	0x06	+12 dB
	0x05	+10 dB
	0x04	+8 dB
	0x03	+6 dB
	0x02	+4 dB
	0x01	+2 dB
0x00	0 dB	

#### 15. AE\_Gain Limit Table

Gain	Index(p)	Value
	0x0F	+30 dB
	0x0E	+28 dB
	0x0D	+26 dB
	0x0C	+24 dB
	0x0B	+22 dB
	0x0A	+20 dB
	0x09	+18 dB
	0x08	+16 dB
	0x07	+14 dB
	0x06	+12 dB
	0x05	+10 dB
	0x04	+8 dB

## 16. AE\_Exposure Comp. Table

Exposure Comp.	Index(p)	Value(Level)
	0x0B	5
	0x0A	4
	0x09	3
	0x08	2
	0x07	1
	0x06	0
	0x05	-1
	0x04	-2
	0x03	-3
	0x02	-4
	0x01	-5
	0x00	-6

## 17. Camera Command List

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel	–	8x 2p FF	p: Socket No. (=1 or 2)
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off (Standby)	8x 01 04 00 03 FF	
CAM_AutoPowerOff	Direct	8x 01 04 40 0p 0q 0r 0s FF	<p>Auto Power Off, pqrs: 0000 To FFFF</p> <p>pqrs: Power Off Timer 0000 (Timer Off) to FFFF (65535min)</p> <p>Initial value: 0000</p> <p>The power automatically turns off if the camera does not receive any VISCA commands or any signals from the Remote Commander for the duration you set in the timer.</p>
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele (Standard)	8x 01 04 07 02 FF	
	Wide (Standard)	8x 01 04 07 03 FF	
	Tele Step	8x 01 04 07 04 FF	
	Wide Step	8x 01 04 07 05 FF	
	Tele (Variable)	8x 01 04 07 2p FF	p=0 (Low) to 7 (High)
	Wide (Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position(0x0000~0x4000) , Optical Zoom Tele max position: 0x4000

Command Set	Command	Command Packet	Comments
	Direct(Speed Variable)	8x 01 04 47 0p 0q 0r 0s 0t FF	pqrs: Zoom Position(0x0000~0x4000) , Optical Zoom Tele max position: 0x4000, t:0~7(0 :Low, 7:High)
CAM_Focus	Stop	8x 01 04 08 00 FF	p=0 (Low) to 7 (High) (* Enabled during Manual Focus Mode)
	Far (Standard)	8x 01 04 08 02 FF	
	Near (Standard)	8x 01 04 08 03 FF	
	Far Step	8x 01 04 08 04 FF	
	Near Step	8x 01 04 08 05 FF	
	Far (Variable)	8x 01 04 08 2p FF	
	Near (Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position , pqrs parameters are in the General Zoom Foucs Table 0x00 ~ 0x102 (* Enabled during Manual Focus Mode)
	Auto Focus	8x 01 04 38 02 FF	AF ON/OFF
	Manual Focus	8x 01 04 38 03 FF	
Auto/Manual	8x 01 04 38 10 FF		
	One Push Trigger	8x 01 04 18 01 FF	One Push AF Trigger(* Enabled during Manual Focus Mode)
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position(0x0000~0x4000) tuv: Focus Position(0x00 ~ 0x102) (* Enabled during Manual Focus Mode)

Command Set	Command	Command Packet	Comments
Resolution Settting	—	8x 01 06 35 00 0p FF	p: 0x00:1080p-60 0x01:1080p-59.94 0x02:1080p-50 0x03:1080p-30 0x04:1080p-29.97 0x05:1080p-25 0x06:1080i-60 0x07:1080i-59.94 0x08:1080i-50 0x09:720p-60 0x0A:720p-59.94 0x0B:720p-50
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	One Push WB	8x 01 04 35 03 FF	One Push WB mode
	ATW	8x 01 04 35 04 FF	Auto Tracing White Balance
	Manual	8x 01 04 35 05 FF	Manual mode
	Sodium Lamp	8x 01 04 35 06 FF	Sodium lamp source fixed mode
	3000K	8x 01 04 35 07 FF	Color temperture fixed at 3000K mode
	4300K	8x 01 04 35 08 FF	Color temperture fixed at 4300K mode

Command Set	Command	Command Packet	Comments
	5000K	8x 01 04 35 09 FF	Color temperture fixed at 5000K mode
	6500K	8x 01 04 35 0A FF	Color temperture fixed at 6500K mode
	8000K	8x 01 04 35 0B FF	Color temperture fixed at 8000K mode
	WideAuto	8x 01 04 35 0C FF	Wide Auto mode
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger(* Enabled during One Push WB Mode)
CAM_WB_RGAIN	Reset	8x 01 04 03 00 FF	Manual R gain Setting
	Up	8x 01 04 03 02 FF	(* Enabled during WB Manual mode )
	Down	8x 01 04 03 03 FF	pq = 0x00 To 0x80
	Direct	8x 01 04 43 00 00 0p 0q FF	
CAM_WB_BGAIN	Reset	8x 01 04 04 00 FF	Manual B gain Setting
	Up	8x 01 04 04 02 FF	(* Enabled during WB Manual mode )
	Down	8x 01 04 04 03 FF	pq = 0x00 To 0x80
	Direct	8x 01 04 44 00 00 0p 0q FF	
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	White Board	8x 01 04 39 5F FF	White Board Mode
	Smooth Auto	8x 01 04 39 60 FF	Smooth Auto
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	(* Enabled during AE Shutter Priority/Manual Mode)
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq: Shutter Position , pq: 00 To 15
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting

Command Set	Command	Command Packet	Comments
	Up	8x 01 04 0B 02 FF	(* Enabled during Iris Priority/Manual Mode)
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq: Iris Position , pq: 00 To 0E
	Iris Limit	8x 01 04 2B 0p FF	p: Iris F number , p: 0 To 7 (* Disabled during AE Manual Mode and IrisPri Mode)
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting
	Up	8x 01 04 0C 02 FF	(* Enabled during AE Manual Mode)
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 00 00 0p 0q FF	pq: Gain Position, pq:00 To 0F (* Enabled during AE Manual Mode)
	Gain Limit	8x 01 04 2C 0p FF	p: Gain Position , p: 4 To F (* Disabled during AE Manual Mode)
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting (* Enabled during ExpComp On )
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	
CAM_BackLight	On	8x 01 04 33 02 FF	Back Light Compensation ON/OFF (* Enabled during AE Full Auto Mode)
	Off	8x 01 04 33 03 FF	



Command Set	Command	Command Packet	Comments
CAM_WD	Set Parameter	8x 01 04 2D 0p FF	WDR Mode p:0~5
CAM_Aperture (Sharpness)	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain, pq: 00 To 0F
CAM_HR	On	8x 01 04 52 02 FF	High-Resolution Mode ON/OFF
	Off	8x 01 04 52 03 FF	
CAM_2DNR	—	8x 01 04 53 0p FF	p: NR Setting , p: 0 To 6 (0: Auto,1:Off 6: Max )
CAM_3DNR	—	8x 01 04 54 0p FF	p: NR Setting , p: 0:Off 1:Low 2:Typ 3:Max 4:Auto
CAM_Gamma	—	8x 01 04 5B 0p FF	p: Gamma setting ,p: 0 To 3 (* Enabled during Image Mode = Custom mode )
CAM_HighSensitivity	On	8x 01 04 5E 02 FF	High Sensitivity mode ON/OFF
	Off	8x 01 04 5E 03 FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Mirror Image ON/OFF
	Off	8x 01 04 61 03 FF	
CAM_Freeze	On	8x 01 04 62 02 FF	Still Image ON/OFF
	Off	8x 01 04 62 03 FF	
CAM_PictureEffect	Off	8x 01 04 63 00 FF	Picture Effect Setting
	Neg.Art	8x 01 04 63 02 FF	

Command Set	Command	Command Packet	Comments
	B&W	8x 01 04 63 04 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Picture flip ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_Memory (Preset)	Reset	8x 01 04 3F 00 pp FF	pp: Memory Number (pp: 0x00 To 0x7F)
	Set	8x 01 04 3F 01 pp FF	
	Recall	8x 01 04 3F 02 pp FF	
CAM_Mute	On	8x 01 04 75 02 FF	Muting ON/OFF
	Off	8x 01 04 75 03 FF	
	On/Off	8x 01 04 75 10 FF	
CAM_IDWrite	—	8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
CAM_ColorGain(Saturation)	Direct	8x 01 04 49 00 00 00 pq FF	pq:0x00~0x19 (* Enabled during Image Mode = Custom mode )
IR_Receive	On	8x 01 06 08 02 FF	IR(remote commander) receive ON/OFF
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR (remote commander) receive message via the VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	

Command Set	Command	Command Packet	Comments
Pan-tiltDrive	Up 3)	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) VV: 00 To 0x18 WW: 00 To 0x18 YYYY: Pan Position 0x0000 to 0x3A80 & 0xC580 to 0xFFFF (center 0000) ZZZZ: Tilt Position 0x0000 to 0x3DE0 & 0xEB60 to 0xFFFF (center 0000)
	Down 3)	8x 01 06 01 VV WW 03 02 FF	
	Left 3)	8x 01 06 01 VV WW 01 03 FF	
	Right 3)	8x 01 06 01 VV WW 02 03 FF	
	UpLeft 3)	8x 01 06 01 VV WW 01 01 FF	
	UpRight 3)	8x 01 06 01 VV WW 02 01 FF	
	DownLeft 3)	8x 01 06 01 VV WW 01 02 FF	
	DownRight 3)	8x 01 06 01 VV WW 02 02 FF	
	Stop 3)	8x 01 06 01 VV WW 03 03 FF	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
Home	8x 01 06 04 FF		
Reset	8x 01 06 05 FF		
Pan-tiltLimitSet	LimitSet	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W: 1 UpRight YYYY: Pan Limit Position 0x0000~0x3A80 ZZZZ: Tilt Limit Position 0x0000~0x3DE0
	LimitClear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F	W: 0 DownLeft YYYY: Pan Limit Position 0xFFFF~0xC580

Command Set	Command	Command Packet	Comments
		0F 0F FF	ZZZZ: Tilt Limit Position 0xFFFF~0xEB60
Firmware	Firmware version	8x 01 02 03 FF	
Error Code	Read Error Code	8x 01 01 01 FF	
	Clear Error Code Record	8x 02 02 02 FF	
Factory Reset	System Factory Reset	8x 01 04 3F 03 00 FF	
CAM_Image_Mode	Select CAM Image Mode	8x 01 04 3F 04 0p FF	p: 0~6, 6:Custom mode
CAM Prompt	Set Prompt On/Off	8x 01 04 07 00 0p FF	p: 2 to 3, 2:Prompt On , 3:Prompt Off
CAM Model ID	Set Camera model ID	8x 01 04 23 pp qq rr ss FF	ppqq: Vender ID , rrrs:Model ID, default: HD1
AF Speed	Normal	8x 01 04 56 02 FF	Set anytime AF speed : Normal / Fast
	Fast	8x 01 04 56 03 FF	
AF Sensitivity	-	8x 01 04 58 0p FF	p: 1 to 3, 1:High , 2:Middle, 3:Low
CAM_ImageModeBrightness	Set Brightness	8x 01 04 75 67 pq FF	pq: 0x00~0x19(* Enabled during Image Mode = Custom mode )
CAM_ImageModeContrast	Set Contrast	8x 01 04 75 68 pq FF	pq: 0x00~0x19(* Enabled during Image Mode = Custom mode )
CAM_Skin_Tone	select red level	8x 01 04 75 06 0p FF	p: 0~5(* Enabled during Image Mode = Custom mode )
Black Level	Black Level	8x 01 04 75 69 0p FF	p: 0 to 5, 0:Off, 1:Type 1, 2:Type 2, 3:Type 3, 4:Type 4, 5:Type 5 (* Enabled during Image Mode = Custom mode )
SYS_Menu	On	8x 01 06 06 02 FF	turn on the menu screen
	Off	8x 01 06 06 03 FF	turn off the menu screen
	On/Off	8x 01 06 06 10 FF	turn on/off the menu screen
Pan speed table update command	-	8x 01 06 1A 0p 0q 0r 0s 0u 0v FF	pqrs: 0x0 ~ 0xFFFF , uv: 0x0 ~ 0x63
Tilt speed table update	-	8x 01 06 1B 0p 0q 0r 0s 0u 0v FF	pqrs: 0x0 ~ 0xFFFF , uv: 0x0 ~ 0x63

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Command Set	Command	Command Packet	Comments
command			
Pan/Tilt speed table to default	-	8x 01 06 1C 0p 0q 0D 0E 0F FF	pq: 0x18 or 0x64
Pan/tilt speed table size	-	8x 01 06 1D 0p 0q FF	pq: 0x18 or 0x64
Pan/tilt speed table save	-	8x 01 06 1E FF	
CAM_SET_ETHERNET_DHCP	Ethernet DHCP Enable/Disable	8x 01 CC 0p FF	p: 0~1 , 0: Disable 1: Enable
CAM_HARDWARE_FACTORY_RESET	System Hardware Factory Reset	8x 01 CD 0p FF	p: 1, 1: Enable
CAM_MSDC_RESET	MSDC Storage Reset	8x 01 CE 0p FF	p: 1, 1: Enable

## 18. Inquiry Command List

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off (Standby)
CAM_OpticalZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position , pqrs: 0x0000~0x4000
CAM_FocusModelInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position, pqrs: 0x000 to 0x102
Resolution SetttingInq	8x 09 06 23 FF	y0 50 0p FF	p: 0x00:1080p-60 0x01:1080p-59.94 0x02:1080p-50 0x03:1080p-30 0x04:1080p-29.97 0x05:1080p-25 0x06:1080i-60 0x07:1080i-59.94 0x08:1080i-50 0x09:720p-60 0x0A:720p-59.94 0x0B:720p-50
CAM_WBModelInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	In Door
		y0 50 02 FF	Out Door
		y0 50 03 FF	One Push WB
		y0 50 04 FF	ATW

Inquiry Command	Command Packet	Inquiry Packet	Comments
		y0 50 05 FF	Manual
		y0 50 06 FF	Sodium Lamp
		y0 50 07 FF	3000K
		y0 50 08 FF	4300K
		y0 50 09 FF	5000K
		y0 50 0A FF	6500K
		y0 50 0B FF	8000K
		y0 50 0C FF	Wide Auto
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter Priority
		y0 50 0B FF	Iris Priority
		y0 50 5F FF	White Board
		y0 50 60 FF	Smooth Auto
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position, pq: 00 To 15
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position, pq: 00 To 0E
CAM_GainPosInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position, pq: 00 To 0F
CAM_IrisLimitInq	8x 09 04 2B FF	y0 50 0q FF	p: Gain Limit,p: 0 To 7
CAM_GainLimitInq	8x 09 04 2C FF	y0 50 0q FF	p: Gain Limit,p: 4 To F
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position, pq: 00 To 0B
CAM_BackLightModeInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_WDModeInq	8x 09 04 3D FF	y0 50 02 FF	On Wide-D

Inquiry Command	Command Packet	Inquiry Packet	Comments
		y0 50 03 FF	Off
CAM_WDParameterInq	8x 09 04 2D FF	y0 50 0p FF	p: WDR mode off/mid/max(p: 0 To 5)
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain, pq: 00 To 0F
CAM_HRModelInq	8x 09 04 52 FF	y0 50 02 FF	On (Hi-Resolution)
		y0 50 03 FF	Off
CAM_2DNRModelInq	8x 09 04 53 FF	y0 50 0p FF	p: NR Setting , p: 0 To 6 (0: Auto,1:Off 6: Max )
CAM_3DNRModelInq	8x 09 04 54 FF	y0 50 0p FF	p: NR Setting , p: 0:Off 1:Low 2:Typ 3:Max 4:Auto
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	Gamma p: 0 To 3
CAM_HighSensitivityInq	8x 09 04 5E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseModelInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_FreezeModelInq	8x 09 04 62 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureEffectModelInq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 02 FF	Neg.Art
		y0 50 04 FF	B&W
CAM_PictureFlipModelInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_MemoryInq	8x 09 04 3F FF	y0 50 pp FF	pp: Memory number recalled last, default value(no get any recall command) pp:0x00 To 0x7F
CAM_MemSaveInq	8x 09 04 23 0X FF	y0 50 0p 0p 0q 0q FF	X: 00 to 07 (Address) ppqq: 0x0000 to 0xFFFF (Data)
CAM_MuteModelInq	8x 09 04 75 FF	y0 50 02 FF	On
		y0 50 03 FF	Off



Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID, pqrs: 0000 To FFFF
CAM_ColorGainInq	8x 09 04 49 FF	y0 50 00 00 00 pq FF	pq: Color Gain setting , pq: 0x00 To 0x19
SYS_MenuModelInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_Receive	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_ReceiveReturn (IR_Receive Return Message On)	8x 01 7D 01 03 00 00 FF	y0 07 7D 01 04 00 FF	Power ON/OFF
		y0 07 7D 01 04 07 FF	Zoom tele/wide
		y0 07 7D 01 04 38 FF	AF On/Off
		y0 07 7D 01 04 33 FF	CAM_Backlight
		y0 07 7D 01 04 3F FF	CAM_Memory(All memory set)
		y0 07 7D 01 06 01 FF	Pan_tiltDrive
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 ww zz FF	ww = Pan Max Speed, ww: 0x18 zz = Tilt Max Speed, zz: 0x18
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	wwww: 【0x0000 To 0x3A80】 or 【0xFFFF To 0xC580】 zzzz: 【0x0000 To 0x3DE0】 or 【0xFFFF To 0xEB60】 wwww = Pan Position zzzz = Tilt Position
Pan-tiltModelInq	8x 09 06 10 FF	y0 50 pq rs FF	pqrs: 0000 To FFFF, see the General Pan Tilt Mode Status Table
CAM Image ModelInq	8x 09 04 3F 04 FF	y0 50 0p FF	p:0 To 6
Prompt Inq	8x 09 04 07 00 FF	y0 50 0p FF	Prompt OnOff 2:On,3:Off
CAM Version Inq	8x 09 00 02 FF	y0 50 pp qq rr ss jj jj kk FF	ppqq: Vender ID,rrss: Model ID,jjjj: Rom revision,kk:

Inquiry Command	Command Packet	Inquiry Packet	Comments
			Maximum socket
AF SensitivityInq	8x 09 04 58 FF	y0 50 00 00 00 0p FF	p: 1 to 3, 1:High , 2:Middle, 3:Low
CAM_AF Speed Inq	8x 09 04 56 FF	y0 50 02 FF	Normal
		y0 50 03 FF	Fast
BlackLevelInq	8x 09 04 75 69 FF	y0 50 0p FF	p: 0 to 5, 0:Off, 1:Type 1, 2:Type 2, 3:Type 3,4:Type 4,5:Type 5
Pan speed table inq	8x 09 06 1A 0p 0q FF	y0 50 0p 0q 0r 0s FF	pq: 0x0 ~ 0x63, pqr: 0x0 ~ 0xFFFF
Tilt speed table inq	8x 09 06 1B 0p 0q FF	y0 50 0p 0q 0r 0s FF	pq: 0x0 ~ 0x63, pqr: 0x0 ~ 0xFFFF

## 19. Camera Block Inquiry Command List

### 19.1 Lens Control System Inquiry Commands.....Command Set 8x 09 7E 7E 00 FF

Byte	Bit	Comments
Byte0	0	Source Address
	1	
	2	
	3	
	4	Destination Address
	5	
	6	
	7	
Byte1	0	0
	1	0
	2	0
	3	0
	4	1
	5	0
	6	1
	7	0 Completion Message (50h)
Byte2	0	Zoom Position (HH)
	1	
	2	
	3	0
	4	
	5	
	6	
	7	

Byte	Bit	Comments
Byte3	0	Zoom Position (HL)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte4	0	Zoom Position (LH)
	1	
	2	
	3	0
	4	
	5	
	6	
	7	
Byte5	0	Zoom Position (LL)
	1	
	2	
	3	0
	4	
	5	
	6	
	7	

Byte	Bit	Comments
Byte6	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte7	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte8	0	Focus Position (HH)
	1	
	2	
	3	0
	4	
	5	
	6	
	7	

Byte	Bit	Comments
Byte9	0	Focus Position (HL)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte10	0	Focus Position (LH)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte11	0	Focus Position (LL)
	1	
	2	
	3	
	4	0
	5	0

Byte	Bit	Comments
Byte12	6	0
	7	0
	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
Byte13	6	0
	7	0
	0	Focus Mode 0: Manual 1: Auto
	1	Digital Zoom 1: On 0: Off
	2	0
	3	0
	4	0
	5	0

Byte	Bit	Comments
Byte14	6	0
	7	0
Byte15	0	Zoom Command 1: Executing 0: Stopped
	1	Focus Command 1: Executing 0: Stopped
	2	Camera Memory Recall 1: Executing 0: Stopped
	3	0
	4	0
	5	0
	6	0
	7	0
Byte15	0	1
	1	1
	2	1
	3	1
	4	1
	5	1
	6	1
	7	1 Terminator (FFh)

### 19.2 Camera Control System Inquiry Commands.....Command Set 8x 09 7E 7E 01 FF

Byte	Bit	Comments
Byte0	0	Source Address
	1	
	2	
	3	
	4	Destination Address
	5	
	6	
	7	
Byte1	0	0
	1	0
	2	0
	3	0
	4	1
	5	0
	6	1
	7	0 Completion Message (50h)
Byte2	0	R Gain (H)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte3	0	R Gain (L)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte4	0	B Gain (H)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte5	0	B Gain (L)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte6	0	WB Mode
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte7	0	Aperture Gain
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte8	0	Exposure Mode
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte9	0	Reserved
	1	Exposure Comp. 1: On 0: Off
	2	Back Light 1: On 0: Off
	3	Reserved
	4	Wide-D (1: Other than Off,0: Off )
	5	High-Resolution 1: On 0: Off
	6	0
	7	0
Byte10	0	Shutter Position
	1	
	2	
	3	
	4	
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte11	0	Iris Position
	1	
	2	
	3	
	4	
	5	0
	6	0
	7	0
Byte12	0	Gain Position
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte13	0	Bright Position
	1	
	2	
	3	
	4	
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte14	0	Exposure Comp. Position
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte15	0	1
	1	1
	2	1
	3	1
	4	1
	5	1
	6	1
	7	1 Terminator (FFh)

**19.3 Other Inquiry Commands.....Command Set 8x 09 7E 7E 02 FF**

Byte	Bit	Comments
Byte0	0	Source Address
	1	
	2	
	3	
	4	Destination Address
	5	
	6	
	7	
Byte1	0	0
	1	0
	2	0
	3	0
	4	1
	5	0
	6	1
	7	0 Completion Message (50h)
Byte2	0	Power 1: On 0: Off
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte3	0	0
	1	0
	2	LR Reverse 1: On 0: Off
	3	Freeze 1: On 0: Off
	4	ICR 1: On 0: Off
	5	0
	6	0
	7	0
Byte4	0	0
	1	0
	2	0
	3	0
	4	Mute 1: On 0: Off
	5	0
	6	0
	7	0
Byte5	0	Picture Effect Mode
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte6	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte7	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte8	0	Camera ID (HH)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte9	0	Camera ID (HL)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte10	0	Camera ID (LH)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte11	0	Camera ID (LL)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte12	0	1: 1/50, 1/25 0: 1/60, 1/30
	1	0
	2	ICR 1: Provided 0: Not provided
	3	0
	4	Memory 1: Provided 0: Not provided
	5	0
	6	0
	7	0
Byte13	0	0

Byte	Bit	Comments
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte14	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
Byte15	7	0
	0	1
	1	1
	2	1
	3	1
	4	1
	5	1
	6	1
7	1 Terminator (FFh)	



**19.4 Enlargement Function1 Query Command.....Command Set 8x 09 7E 7E 03 FF**

Byte	Bit	Comments
Byte0	0	Source Address
	1	
	2	
	3	
	4	Destination Address
	5	
	6	
	7	
Byte1	0	0
	1	0
	2	0
	3	0
	4	1
	5	0
	6	1
	7	0 Completion Message (50h)
Byte2	0	Digital Zoom Position (H)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte3	0	Digital Zoom Position (L)
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte4	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte5	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte6	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte7	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte8	0	Reserved
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte9	0	Reserved
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0
Byte10	0	Picture flip (1: On, 0: Off )
	1	Alarm (1: On, 0: Off )
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte11	0	Picture flip (1: Provided, 0: Not provided)
	1	0
	2	Advanced Privacy (1: Provided, 0: Not provided)
	3	Color Gain (0h (60%) to Eh (200%))
	4	
	5	
	6	
	7	0
Byte12	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte13	0	2NR Level
	1	
	2	
	3	High Sensitivity mode (1: ON, 0: OFF)
	4	Gamma
	5	
	6	0
Byte14	7	0
	0	Gain Limit
	1	
	2	
	3	Reserved
	4	
	5	
6		
7	0	
Byte15	0	1
	1	1
	2	1
	3	1
	4	1
	5	1
	6	1
	7	1 Terminator (FFh)

**19.5 Enlargement Function2 Query Command.....Command Set 8x 09 7E 7E 04 FF**

Byte	Bit	Comments
Byte0	0	Source Address
	1	
	2	
	3	
	4	Destination Address
	5	
	6	
	7	
Byte1	0	0
	1	0
	2	0
	3	0
	4	1
	5	0
	6	1
	7	0 Completion Message (50h)
Byte2	0	WideD mode (0: OFF, 1: ON)
	1	
	2	
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte3	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte4	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte5	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte6	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte7	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte8	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte9	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte10	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte11	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte12	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte13	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte14	0	0
	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
Byte15	0	1
	1	1
	2	1
	3	1
	4	1
	5	1
	6	1
	7	1 Terminator (FFh)

**19.6 Enlargement Function3 Query Command.....Command Set 8x 09 7E 7E 05 FF**

Byte	Bit	Comments
Byte0	0	Source Address
	1	
	2	
	3	
	4	Destination Address
	5	
	6	
	7	
Byte1	0	0
	1	0
	2	0
	3	0
	4	1
	5	0
	6	1
	7	0 Completion Message (50h)
Byte2	0	Reserved
	1	
	2	
	3	
	4	0
	5	0
	6	0
	7	0

Byte	Bit	Comments
Byte3	0	Reserved
	1	
	2	
	3	
	4	
	5	
	6	
	7	
Byte4	0	Reserved
	1	
	2	
	3	
	4	
	5	
	6	
	7	
Byte5	0	Reserved
	1	
	2	
	3	
	4	
	5	
	6	
	7	

Byte	Bit	Comments
Byte6	0	Reserved
	1	
	2	
	3	
	4	
	5	
	6	
	7	
Byte7	0	Reserved
	1	
	2	
	3	
	4	
	5	
	6	
	7	
Byte8	0	Reserved
	1	
	2	
	3	
	4	
	5	
	6	
	7	

Byte	Bit	Comments
Byte9	0	
	1	
	2	
	3	
	4	
	5	
	6	
7	0	
Byte10	0	
	1	
	2	
	3	
	4	
	5	
	6	
7	0	

Byte	Bit	Comments
Byte11	0	
	1	
	2	
	3	
	4	
	5	
	6	
7	0	
Byte12	0	
	1	
	2	
	3	
	4	
	5	
	6	
7	0	

Byte	Bit	Comments
Byte13	0	
	1	
	2	
	3	
	4	
	5	
	6	
7	0	
Byte14	0	
	1	
	2	
	3	
	4	
	5	
	6	
7	0	
Byte15	0	1
	1	1
	2	1
	3	1
	4	1
	5	1
	6	1
7	1 Terminator (FFh)	

## **20. RS232 over IP**

### **20.1 Overview of RS232 over IP**

RS232 over IP allows you to control this unit from the controller with the IP communication function via the LAN by using RS232.

You can connect up to 5 controllers simultaneously on one LAN segment.

The communication specifications of RS232 over IP are as follows:

### **20.2 Interface**

RJ-45 10Base-T/100Base-TX (automatically discrimination)

### **20.3 Internet protocol**

IPv4

### **20.4 Transport protocol**

UDP

### **20.5 IP address**

Set by the IP card setting command

### **20.6 Port address**

52381

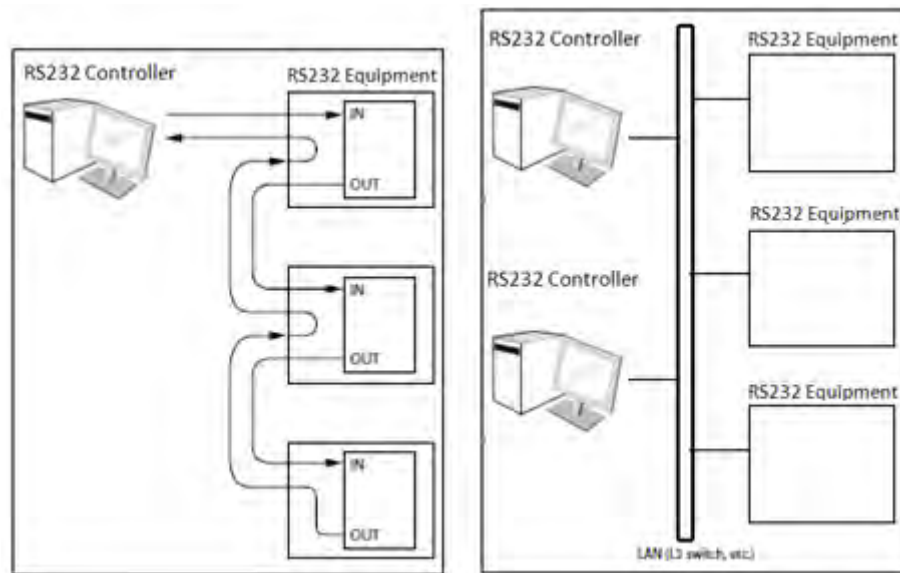
### **20.7 Delivery confirmation/Retransmission control**

Depends on the application

### **20.8 Coverage**

Limited dedicated network in the same segment without going through a bridge connection.

In this section, the device outputting commands, for example, a computer, is called the controller, and this unit and the devices connected to the same LAN are called the peripheral device. In the connection using RS-232/RS-422, the controllers and peripheral devices are connected to a one-direction ring. On the IP communication connection, the controllers and peripheral devices are connected by star type through a LAN.



**RS232/RS422 connection**

**IP communication connection**

While the IP communication connection, the address of each device cannot be set in the RS232 message as it is because the controllers and peripheral devices that are connected simultaneously are increased. In this case, addresses of the controllers and peripheral devices that are set in the RS232 message are locked to 0 (for the controller) or 1 (for the peripheral device).

## 20.9 Packet Structure

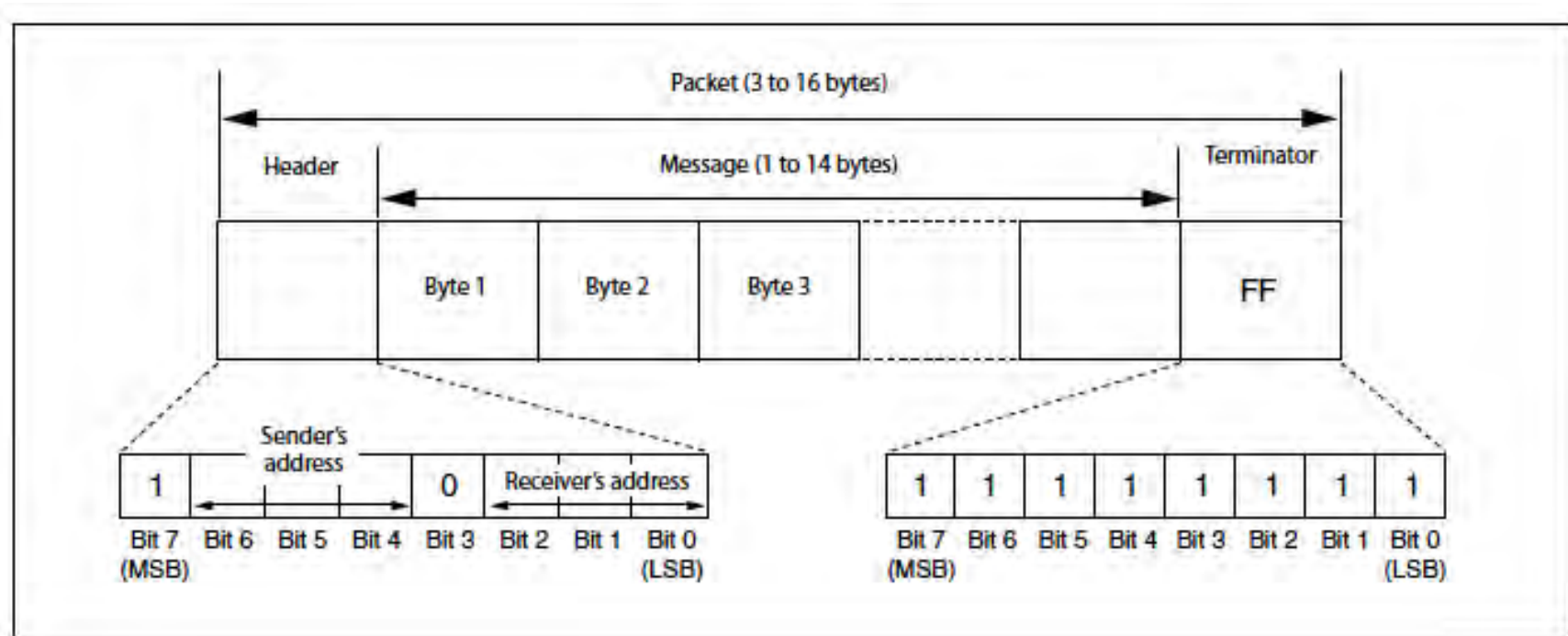
The basic unit of VISCA communication is called a packet [Pic.1]. The first byte of the packet is called the header and comprises the sender's and receiver's addresses. For example, the header of the packet sent to the SRG assigned address 1 from the controller (address 0) is 81h in hexadecimal. The packet sent to the SRG assigned address 2 is 82h. In the command list, as the header is 8X, input the address of the SRG to X. The header of the reply packet from the SRG assigned address 1 is 90h. The packet from the SRG assigned address 2 is A0h.

Some of the setting commands for SRG can be sent to all devices at one time (broadcast)\*. In the case of broadcast, the header should be 88h in hexadecimal.



When the terminator is FFh, it signifies the end of the packet.

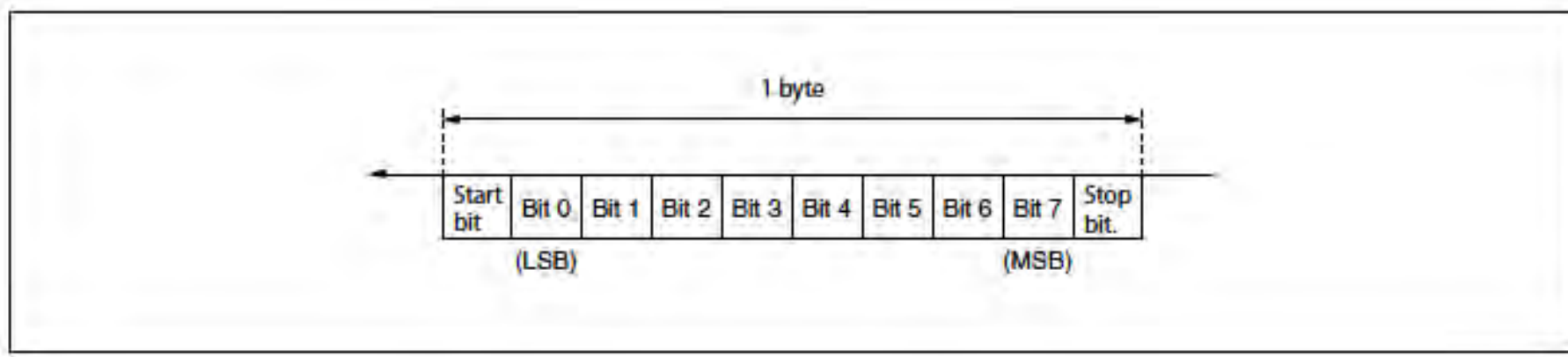
\*The broadcast function is not available for VISCA over IP.



Pic. 1 Packet structure

Note:

Pic. 1 shows the packet structure, while Pic.2 shows the actual waveform. Data flow will take place with the LSB first.



Pic. 2 Actual waveform for 1 byte

## 21. Communication method of VISCA over IP

### 21.1 Communication method

VISCA over IP can process the VISCA communication between the controllers and peripheral devices using the messages that can be identified on the LAN, and sends/receives them. Because of this, VISCA over IP is not concerned about the contents of the communication between the controllers and peripheral devices. However, the VISCA communication sequence is different, depending on the types, as follows.

### 21.2 VISCA command

This is a command from the controller to the peripheral device. When the peripheral device receives this command, Acknowledge is returned. After completing command processing, a completion notice is returned. This command uses the socket of VISCA. The order of completion notices may be changed if the multiple commands are sent to the same peripheral device.

### 21.3 VISCA inquiry

This is an inquiry from the controller to the peripheral device. When the peripheral device receives this type of command, the reply for the inquiry is returned. This command does not use the socket of VISCA. The order of the replies is not changed if a multiple commands are sent.

#### **21.4 VISCA reply**

This is an Acknowledge, completion notice, reply, or error reply from the peripheral device to the controller. The classification for sending messages from the peripheral device to the controller is common.

#### **21.5 VISCA device setting command**

This is the device setting command from the controller to the peripheral device. When the peripheral device receives this classification command, the peripheral device performs the function depend on the command.

#### **21.6 Address**

Sets the address of the peripheral device, and does not return a reply to the controller. While using VISCA over IP, the address command is not sent from the controller because a Network Change command from the peripheral device that triggers sending command is not issued.

#### **21.7 IF\_Clear**

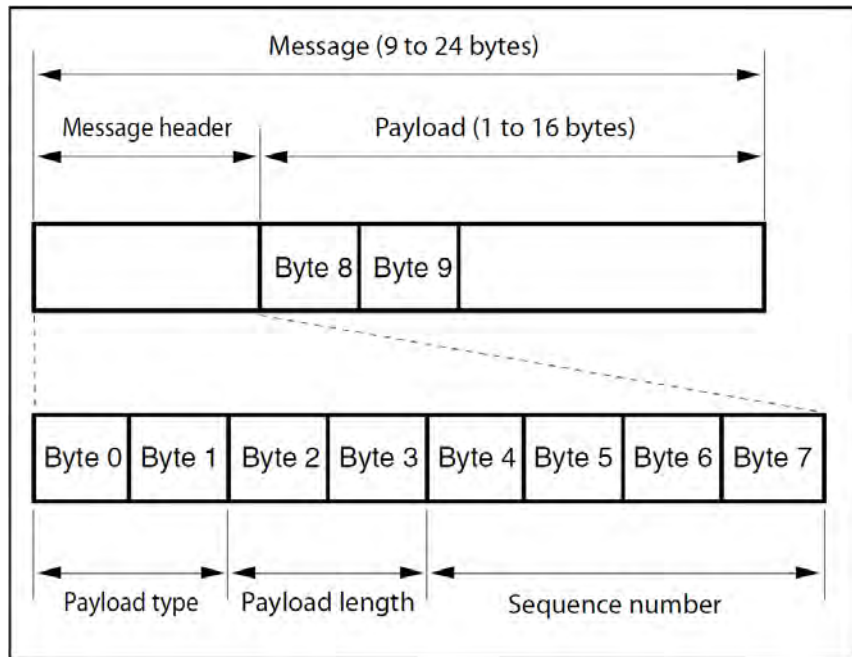
Sends the reply message to the controller after clearing, without using VISCA socket.

#### **21.8 CAM\_VerslonInq**

Sends the reply message to the controller, without using VISCA socket.

#### **21.9 Format**

These are the specifications of the message header (8 bytes) and payload (1 to 16 bytes).



Note: The actual LAN out method is big-endian, LSB first.

Pic.3 Message structure of the VISCA over IP

### 21.10 Payload type

Stores the value (Byte 0 and Byte 1) of the following table on the payload division.

Name	Value (Byte 0)	Value (Byte 1)	Description
VISCA command	01h	00h	Stores the VISCA command.
VISCA inquiry	01h	10h	Stores the VISCA inquiry.
VISCA reply	01h	11h	Stores the reply for the VISCA command and VISCA inquiry, or VISCA device setting command.
VISCA device setting command	01h	20h	Stores the VISCA device setting command.
Control command	02h	00h	Stores the control command.
Control reply	02h	01h	Stores the reply for the control command.

Pic.4 Payload Type Table

### **21.11 Payload length**

Stores the number of bytes (1 to 16) of data is stored on the payload.

Example: when the payload length is 16 bytes.

Byte 2:00h

Byte 3:10h

### **21.12 Sequence number**

The controller stores the sequence number that is added every time a message is sent. If the sequence number reaches the limit, next values will be 0. The peripheral device saves the sequence number in the message from the controller, and stores the sequence number of the received message corresponding to the message sent to the controller.

### **21.13 Payload**

Depending on the payload type, the following are stored.

- VISCA command
  - Stores the packet of the VISCA command.
- VISCA inquiry
  - Stores the packet of VISCA message.
- VISCA reply
  - Stores the reply for the command or inquiry (Acknowledge message, completion message, or error message).
- VISCA device setting command
  - Stores the packet of the VISCA device setting command.
- Control command
  - The following are stored on the payload division of the control command.

Name	Value	Description
RESET	01h	Resets the sequence number to 0. The value that was set as the sequence number is ignored.
ERROR	0Fyyh	yy=01: Abnormality in the sequence number.
		yy=02: Abnormality in the message (message type)

- Controlled reply
  - The following are stored on the payload division of the reply for the control command.

Message	Value	Description
Acknowledge	01h	Reply for RESET.

#### 21.14 Delivery confirmation

VISCA over IP uses UDP as a communications protocol of the transport layer. Delivery of messages is not guaranteed for the UDP communication. Delivery confirmation and retransmission should be performed on the application.

When the controller sends a message to the peripheral device, wait until a reply for the message is received before sending the next message. You can confirm delivery of messages by managing the time-out waiting for a reply message sent.

If time out occurs on the controller, loss of one of the following message is considered:

- Command
- Acknowledge message
- Completion message for command
- Inquiry
- Reply message for the inquiry
- Error message
- Inquiry of the VISCA device setting command
- Reply message of the VISCA device setting command.

## 22. PelcoD Internal Command List

Internal Command	Byte 1	Byte 2 (Address)	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Comments
Right	0xFF	0x00 ~ 0xFF	0x00	0x02	0xVV	0xWW	Checksum	VV : Tilt speed 0x01 (low speed) to 0x18 (high speed) , 0x19 ~ 0xFE (speed follow zoom position) WW : Pan speed 0x01 (low speed) to 0x18 (high speed) , 0x19 ~ 0xFE (speed follow zoom position)
Left	0xFF	0x00 ~ 0xFF	0x00	0x04	0xVV	0xWW	Checksum	
Up	0xFF	0x00 ~ 0xFF	0x00	0x08	0xVV	0xWW	Checksum	
Down	0xFF	0x00 ~ 0xFF	0x00	0x10	0xVV	0xWW	Checksum	
Right - Up	0xFF	0x00 ~ 0xFF	0x00	0x0A	0xVV	0xWW	Checksum	
Left - Up	0xFF	0x00 ~ 0xFF	0x00	0x0C	0xVV	0xWW	Checksum	
Right - Down	0xFF	0x00 ~ 0xFF	0x00	0x12	0xVV	0xWW	Checksum	
Left - Down	0xFF	0x00 ~ 0xFF	0x00	0x14	0xVV	0xWW	Checksum	
Stop	0xFF	0x00 ~ 0xFF	0x00	0x00	0x00	0x00	Checksum	Stop Pan/Tilt & Zomm/Focus
Zoom Tele	0xFF	0x00 ~ 0xFF	0x00	0x20	0x00	0x00	Checksum	Speed = VISCA Tele (Variable) = 0x03
Zoom Wide	0xFF	0x00 ~ 0xFF	0x00	0x40	0x00	0x00	Checksum	Speed = VISCA Wide (Variable) = 0x03
Focus Far	0xFF	0x00 ~ 0xFF	0x00	0x80	0x00	0x00	Checksum	Speed = VISCA Far (Variable) = 0x02
Focus Near	0xFF	0x00 ~ 0xFF	0x01	0x00	0x00	0x00	Checksum	Speed = VISCA Near (Variable) = 0x02
Checksum = Mod((Byte 2 + Byte 3 + Byte 4 + Byte 5 + Byte 6), 0x100);								

## 23. PelcoD External Command List

### 22.1 External Command

Extenal Command	Byte 1	Byte 2 (Address)	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Comments
Set Preset	0xFF	0x00 ~ 0xFF	0x00	0x03	0x00	0xpq	Checksum	Memory Number( pq:0x00 To 0x7F)
Clear Preset	0xFF	0x00 ~ 0xFF	0x00	0x05	0x00	0xpq	Checksum	
Goto Preset	0xFF	0x00 ~ 0xFF	0x00	0x07	0x00	0xpq	Checksum	
POWER	0xFF	0x00 ~ 0xFF	0x00	0x45	0x00	On:0x01 Off: 0x02	Checksum	Power On/Off
MENU	0xFF	0x00 ~ 0xFF	0x00	0x47	0x00	On:0x01	Checksum	System Menu On/Off

						Off: 0x02		
ENTER	0xFF	0x00 ~ 0xFF	0x00	0x49	0x00	0x00	Checksum	Menu Enter
BACKLIGHT	0xFF	0x00 ~ 0xFF	0x00	0x31	0x00	On:0x01 Off: 0x02	Checksum	Back Light Compensation ON/OFF (* Enabled during AE Full Auto Mode)
MIRROR	0xFF	0x00 ~ 0xFF	0x00	0x4B	0x00	0x01:Normal 0x02:Mirror 0x03:Flip 0x04:Mirror+Flip	Checksum	Mirror Image ON/OFF & Picture flip ON/OFF
FREEZE	0xFF	0x00 ~ 0xFF	0x00	0x4D	0x00	On:0x01 Off: 0x02	Checksum	Still Image ON/OFF
Auto Focus / Manual Focus	0xFF	0x00 ~ 0xFF	0x00	0x2B	0x00	AF:0x01 MF: 0x02	Checksum	AF/MF Switch
Bright Ctrl Up	0xFF	0x00 ~ 0xFF	0x00	0xA1	0x00	0x00	Checksum	AE Bright Control Up
Bright Ctrl Down	0xFF	0x00 ~ 0xFF	0x00	0xA3	0x00	0x00	Checksum	AE Bright Control Down

## 22.2 Query Command

Query Command	Byte 1	Byte 2 (Address)	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Comments
<b>Query Command Package</b>								
Query Pan Position	0xFF	0x00 ~ 0xFF	0x00	0x51	0x00	0x00	Checksum	Get Pan Postion
Query Tilt Position	0xFF	0x00 ~ 0xFF	0x00	0x53	0x00	0x00	Checksum	Get Tilt Postion
Query Zoom Position	0xFF	0x00 ~ 0xFF	0x00	0x55	0x00	0x00	Checksum	Get Zoom Position
Query POWER	0xFF	0x00 ~ 0xFF	0x00	0x61	0x00	0x00	Checksum	Get Power On/Off Status
Query MENU	0xFF	0x00 ~ 0xFF	0x00	0x63	0x00	0x00	Checksum	Get Menu On/Off Status
Query BACKLIGHT	0xFF	0x00 ~ 0xFF	0x00	0x65	0x00	0x00	Checksum	Get Backlight On/Off Status



Query Command	Byte 1	Byte 2 (Address)	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Comments
Query MIRROR	0xFF	0x00 ~ 0xFF	0x00	0x67	0x00	0x00	Checksum	Get Mirror & Flip Status
Query FREEZE	0xFF	0x00 ~ 0xFF	0x00	0x69	0x00	0x00	Checksum	Get Freeze Status
<b>Query Ack Package</b>								
Query Pan Response	0xFF	0x00 ~ 0xFF	0x00	0x59	0x pq	0x rz	Checksum	pqrz: Pan Position 0x0000 to 0x3A80 & 0xC580 to 0xFFFF (center 0000)
Query Tilt Response	0xFF	0x00 ~ 0xFF	0x00	0x5B	0x pq	0x rz	Checksum	pqrz: Tilt Position 0x0000 to 0x3DE0 & 0xEB60 to 0xFFFF (center 0000)
Query Zoom Response	0xFF	0x00 ~ 0xFF	0x00	0x5D	0x pq	0x rz	Checksum	pqrs: Zoom Position , pqrs: 0x0000~0x4000
Query POWER Response	0xFF	0x00 ~ 0xFF	0x00	0x71	0x00	On:0x01 Off: 0x02	Checksum	Power Status Response
Query MENU Response	0xFF	0x00 ~ 0xFF	0x00	0x73	0x00	On:0x01 Off: 0x02	Checksum	Menu Status Response
Query BACKLIGHT Response	0xFF	0x00 ~ 0xFF	0x00	0x75	0x00	On:0x01 Off: 0x02	Checksum	Backlight Status Response
Query MIRROR Response	0xFF	0x00 ~ 0xFF	0x00	0x77	0x00	0x01:Normal 0x02:Mirror 0x03:Flip 0x04:Mirror+Flip	Checksum	Mirror & Flip Status Response
Query FREEZE Response	0xFF	0x00 ~ 0xFF	0x00	0x79	0x00	On:0x01 Off: 0x02	Checksum	Freeze Status Response
Checksum = Mod((Byte 2 + Byte 3 + Byte 4 + Byte 5 + Byte 6), 0x100);								