


VC-A61PN RS-232 command set

| No | Issue Date | Description | Apply Firmware |
|----|------------|--|----------------|
| 1 | 2020/09/23 | First version. | VCAK100 |
| 2 | 2021/01/15 | Add command: 1. Resolution Setting 1080i(1920 x 1080) - 59.94i/ 50i | VCAK104 |
| 3 | 2021/05/20 | Add command: 1. CAM_Smart_AF | VCAK107 |
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***Notice:**

1. The RS-232 command list is for VC-A61PN
2. The yellow highlight  means the latest update.
3. The blue highlight  means the deleted item.

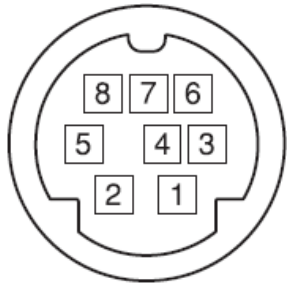
1. Communication Protocol

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 |

1 ACK & Completion message

| | Reply Packet | Note |
|--|--------------|-------------------|
| Ack | X0 4Y FF | Y = socket number |
| Completion (commands) | X0 5Y FF | Y = socket number |
| Completion (Inquiries) | X0 50 ... FF | |
| X = 9 to F==>camera address + 8 , Y=1 to 2 | | |

2 Error message

| Error Packet | Description |
|--|-----------------------------|
| X0 6Y 02 FF | Syntax Error |
| X0 6Y 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 | |

3 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 | | |

4 Network Change

| | Packet | Note |
|---------------------------------|-------------|---|
| Address set | 88 30 01 FF | Always broadcasted(Reply:88 30 0w FF w:1+Address) |
| Network Change | X0 38 FF | |
| X = 9 to F==>camera address + 8 | | |

5 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) | | |

6 Zoom Focus Position Table

| | | | |
|----------------|----------|----|----------|
| Zoom Position | Wide end | | Tele end |
| | 0000 | to | 4000 |
| Focus Position | Far end | | Near end |
| | 000 | to | 47A |

7 AE_Iris Table

| Iris | Index(pq) | Value |
|------|-----------|-------|
| | 0F | Close |
| | 0E | F1.6 |
| | 0D | F2 |
| | 0C | F2.2 |
| | 0B | F2.7 |
| | 0A | F3.2 |
| | 09 | F3.8 |
| | 08 | F4.5 |
| | 07 | F5.4 |
| | 06 | F6.3 |
| | 05 | F7.8 |
| | 04 | F9 |
| | 03 | F11 |
| | 02 | F13 |
| | 01 | F16 |
| 00 | F18 | |

8 AE_Shutter Table

| | Index(pq) | 60/30 mode | 50/25 mode |
|---------------|-----------|------------|------------|
| Shutter Speed | 00 | 1/10000 | 1/10000 |
| | 01 | 1/5000 | 1/5000 |
| | 02 | 1/3000 | 1/3000 |
| | 03 | 1/2500 | 1/2500 |
| | 04 | 1/2000 | 1/1750 |
| | 05 | 1/1500 | 1/1250 |
| | 06 | 1/1000 | 1/1000 |
| | 07 | 1/725 | 1/600 |
| | 08 | 1/500 | 1/425 |
| | 09 | 1/350 | 1/300 |
| | 0A | 1/250 | 1/215 |
| | 0B | 1/180 | 1/150 |
| | 0C | 1/120 | 1/120 |
| | 0D | 1/100 | 1/100 |
| | 0E | 1/90 | 1/75 |
| | 0F | 1/60 | 1/50 |
| | 10 | 1/30 | 1/25 |
| | 11 | 1/15 | 1/12 |
| | 12 | 1/8 | 1/6 |
| | 13 | 1/4 | 1/3 |
| | 14 | 1/2 | 1/2 |
| | 15 | 1/1 | 1/1 |

9 AE Gain Table

| Gain | Index(pq) | Value |
|------|-----------|--------|
| | 0F | +45 dB |
| | 0E | +42 dB |
| | 0D | +39 dB |
| | 0C | +36 dB |
| | 0B | +33 dB |
| | 0A | +30 dB |
| | 09 | +27 dB |
| | 08 | +24 dB |
| | 07 | +21 dB |
| | 06 | +18 dB |
| | 05 | +15 dB |
| | 04 | +12 dB |
| | 03 | +9 dB |
| | 02 | +6 dB |
| | 01 | +3 dB |
| 00 | 0 dB | |

10 AE_Exposure Comp. Table

| Exposure Comp. | Index(pq) | Value(Level) | (Gain)Value |
|----------------|-----------|--------------|-------------|
| | 0A | 5 | +5 dB |
| | 09 | 4 | +4 dB |
| | 08 | 3 | +3 dB |
| | 07 | 2 | +2 dB |
| | 06 | 1 | +1 dB |
| | 05 | 0 | 0 dB |
| | 04 | -1 | -1 dB |
| | 03 | -2 | -2 dB |
| | 02 | -3 | -3 dB |
| | 01 | -4 | -4 dB |
| | 00 | -5 | -5 dB |

11 Camera RS232 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_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 Min. 0000h Max. 4000h (In DZoom = Off) Max. 6000h (In DZoom = Pixel Zoom (Super Resolution Zoom), and monitoring mode FHD or HD) Max. 7AC0h (In DZoom = On) |
| | Direct(Speed Variable) | 8x 01 04 47 0p 0q 0r 0s 0t FF | pqrs: Zoom Position Min. 0000h Max. 4000h (In DZoom = Off) Max. 6000h (In DZoom = Pixel Zoom (Super Resolution Zoom), and monitoring mode FHD or HD) Max. 7AC0h (In DZoom = On) t:Zoom speed, t:0~7(0 :Low, 7:High) |

| Command Set | Command | Command Packet | Comments |
|------------------|-------------------|---|---|
| | Zoom Memory Mode | 8x 01 04 47 00 02 FF 8x 01 04 47 00 03 FF | Zoom Memory Mode ON/OFF ON : zoom position apply last memory when power on OFF : zoom return to wide side when power on |
| CAM_Focus | Stop | 8x 01 04 08 00 FF | 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 | p=0 (Low) to 7 (High) |
| | Near (Variable) | 8x 01 04 08 3p FF | (* Enabled during Manual Focus Mode) |
| | Direct | 8x 01 04 48 0p 0q 0r 0s FF | pqrs: Focus Position , pqrs parameters are in the General Zoom Foucs Table (* 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_Curve | Curve tracking | 8x 01 04 38 03 02 FF | Curve tracking ON/OFF |
| | Zoom tracking | 8x 01 04 38 03 03 FF | |
| AF Sensitivity | High | 8x 01 04 58 01 FF | High / Middle / Low |
| | Middle | 8x 01 04 58 02 FF | |
| | Low | 8x 01 04 58 03 FF | |
| AF Frame | Auto | 8x 01 04 5C 01 FF | Auto / Full Frame / Center |
| | Full Frame | 8x 01 04 5C 02 FF | |

| Command Set | Command | Command Packet | Comments |
|-----------------------------------|------------------------|--|--|
| | Center | 8x 01 04 5C 03 FF | |
| | Auto/Full Frame/Center | 8x 01 04 5C 10 FF | |
| CAM_ZoomFocus | Direct | 8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w 0x FF | pqrs: Zoom Position(0x0000~0x4000) tuvw: Focus Position(0x0000 ~ 0x0969) x:Speed(0~7) (* Enabled during Manual Focus Mode) |
| CAM_Initialize | Lens | 8x 01 04 19 01 FF | Lens Initialization Start |
| Resolution Setting | Select Resolution | 8x 01 06 35 0p 0q FF | 0x05:QFHD 4K(3840 x 2160) - 29.97p |
| | | | 0x06:QFHD 4K(3840 x 2160) - 25p |
| | | | 0x08:FHD 1080P(1920 x 1080) - 59.94p |
| | | | 0x09:FHD 1080P(1920 x 1080) - 50p |
| | | | 0x0B:FHD 1080P(1920 x 1080) - 29.97p |
| | | | 0x0C:FHD 1080P(1920 x 1080) - 25p |
| | | | 0x0E:HD 720P(1280 x 720) - 59.94p |
| | | | 0x0F:HD 720P(1280 x 720) - 50p |
| | | | 0x15:FHD 1080i(1920 x 1080) - 59.94i |
| 0x16:FHD 1080i(1920 x 1080) - 50i | | | |
| HDMI Format | RGB | 8x 01 06 36 00 FF | HDMI Format : RGB / YUV422 |
| | YUV422 | 8x 01 06 36 02 FF | |
| HDMI Output Range | 16~235 | 8x 01 06 37 01 FF | HDMI Output Range : 16~235 / 1~254 |
| | 1~254 | 8x 01 06 37 02 FF | |
| CAM_WB | Auto | 8x 01 04 35 00 FF | 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 |

| Command Set | Command | Command Packet | Comments |
|-----------------|------------------|----------------------------|--|
| | 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 0C FF | Sodium lamp source fixed 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 |
| CAM_Flickerless | Off | 8x 01 04 3C 00 FF | |
| | 50Hz | 8x 01 04 3C 01 FF | |
| | 60Hz | 8x 01 04 3C 02 FF | |
| 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 (1/1 ~ 1/10000) |

| Command Set | Command | Command Packet | Comments |
|-------------|-------------------|--|--|
| CAM_Iris | Reset | 8x 01 04 0B 00 FF | Iris Setting (* Enabled during Iris Priority/Manual Mode) |
| | Up | 8x 01 04 0B 02 FF | |
| | Down | 8x 01 04 0B 03 FF | |
| | Direct | 8x 01 04 4B 00 00 0p 0q FF | pq: Iris Position , pq: 00 To 0F |
| | Iris Limit (Min.) | 8x 01 04 2B 0p FF | p: Iris F number , p: 3 To C (* Disabled during AE Manual Mode and IrisPri Mode) |
| | Iris Limit (Max.) | 8x 01 04 2A 0p FF | p: Iris F number , p: 3 To C (* Disabled during AE Manual Mode and IrisPri Mode) |
| | Illegal Iris Open | 8x 01 04 2F 02 FF 8x 01 04 2F 03 FF | Illegal Open Iris ON/OFF |
| CAM_Gain | Reset | 8x 01 04 0C 00 FF | Gain Setting (* Enabled during AE Manual Mode) |
| | Up | 8x 01 04 0C 02 FF | |
| | 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) (* 0dB ~ +45dB) |
| | Gain Limit | 8x 01 04 2C 0p FF | p: Gain Position , p: 3 To F (* Disabled during AE Manual Mode) |
| CAM_Bright | Reset | 8x 01 04 0D 00 FF | Bright Setting |
| | Up | 8x 01 04 0D 02 FF | |
| | Down | 8x 01 04 0D 03 FF | |
| | Direct | 8x 01 04 4D 00 00 0p 0q FF | pq: Bright Position, pq:0x00~0x0F (* Enabled during Image Mode = Custom mode for Lumens used) |
| CAM_ExpComp | On | 8x 01 04 3E 02 FF | Exposure Compensation ON/OFF |

| Command Set | Command | Command Packet | Comments |
|-----------------------------|----------------|----------------------------|--|
| | 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 | pq: ExpComp Position , pq: 00 To 0A (* Enabled during ExpComp On) |
| CAM_BackLight | On | 8x 01 04 33 02 FF | Back Light Compensation ON/OFF |
| | Off | 8x 01 04 33 03 FF | |
| CAM_SpotAE | On | 8x 01 04 59 02 FF | Spot Mode ON/OFF |
| | Off | 8x 01 04 59 03 FF | |
| | Position | 8x 01 04 29 0p 0q 0r 0s FF | pq: X - axis, pq: 00 To 06 (* Center position : 3) rs : Y - axis, rs : 00 To 04 (* Center position : 2) |
| CAM_WDR | Set Parameter | 8x 01 04 2D 0p FF | WDR Mode p:0~3 |
| 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 0E |
| CAM_2DNR | Set 2DNR Level | 8x 01 04 53 0p FF | p: NR Level Setting, p: 0 To 3 |
| CAM_3DNR | Set 3DNR Level | 8x 01 04 54 0p FF | p: NR Level Setting, p: 0: OFF 1: Low 2: Type 3: Max |

| Command Set | Command | Command Packet | Comments |
|---------------------------------|---------------|----------------------|--|
| CAM_Gamma | Gamma setting | 8x 01 04 5B 0p FF | p: 0 To 3 (* Enabled during Image Mode = Custom mode for Lumens used) |
| CAM_LR_Reverse | On | 8x 01 04 61 02 FF | Mirror Image ON/OFF |
| | Off | 8x 01 04 61 03 FF | |
| CAM_PictureEffect | Off | 8x 01 04 63 00 FF | Picture Effect Setting |
| | Neg.Art | 8x 01 04 63 02 FF | |
| | 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_Rotation (Mirror + Flip) | On | 8x 01 04 67 02 FF | Rotation 180 degree ON/OFF |
| | Off | 8x 01 04 67 03 FF | |
| CAM_ICR | On | 8x 01 04 01 02 FF | ICR ON/OFF |
| | Off | 8x 01 04 01 03 FF | (NIGHT : ICR ON, DAY : ICR OFF) |
| CAM_AutoICR | On | 8x 01 04 51 02 FF | Auto ICR ON/OFF |
| | Off | 8x 01 04 51 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 | (* Preset address : 0~127) |
| | Recall | 8x 01 04 3F 02 pp FF | (* Preset address : 0 mapping preset 1 on webpage and remote) |
| | Reset | 8x 01 04 3F 10 pp FF | pp: Memory Number (pp: 0x00 To 0x7F) |
| | Set | 8x 01 04 3F 11 pp FF | (* Preset address : 128~255) |
| | Recall | 8x 01 04 3F 12 pp FF | |
| CAM_Mute | On | 8x 01 04 75 02 FF | Mute ON |
| | Off | 8x 01 04 75 03 FF | Mute OFF |

| Command Set | Command | Command Packet | Comments |
|---------------------------|------------------|--|---|
| | On/Off | 8x 01 04 75 10 FF | Mute Trigger |
| CAM_ColorGain(Saturation) | Direct | 8x 01 04 49 00 00 0p 0q FF | pq: color Gain, pq:0x00~0x0F (* Enabled during Image Mode = Custom mode for Lumens used) |
| 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 | |
| Pan-tiltDrive | Up | 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) |
| | Down | 8x 01 06 01 VV WW 03 02 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) |
| | Left | 8x 01 06 01 VV WW 01 03 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) |
| | Right | 8x 01 06 01 VV WW 02 03 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) |
| | UpLeft | 8x 01 06 01 VV WW 01 01 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) |
| | UpRight | 8x 01 06 01 VV WW 02 01 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) |
| | DownLeft | 8x 01 06 01 VV WW 01 02 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) |
| | DownRight | 8x 01 06 01 VV WW 02 02 FF | VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt Speed 0x01 (low speed) to 0x18 (high speed) |
| | Stop | 8x 01 06 01 00 00 03 03 FF | |
| | AbsolutePosition | 8x 01 06 02 VV WW OY OY OY OY OZ OZ OZ OZ FF | YYYY : Pan Position 0x0000 to 0x6A40 & 0x95C0 to 0xFFFF (center 0000) |

| Command Set | Command | Command Packet | Comments |
|------------------|-----------------------------|---|---|
| | RelativePosition | 8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | ZZZZ : Tilt Position 0x0000 to 0x3840 & 0xED40 to 0xFFFF (center 0000) |
| | 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 YYY: Pan Limit Position 0x0000~0x6A40 ZZZZ: Tilt Limit Position 0x0000~0x3840 W: 0 DownLeft YYY: Pan Limit Position 0xFFFF~0x95C0 ZZZZ: Tilt Limit Position 0xFFFF~0xED40 |
| | LimitClear | 8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF | W: 1:Right,UP clear, 0:Left, Down clear |
| Factory Reset | System Factroy Reset - User | 8x 01 04 3F 03 00 FF | Factory Reset |
| | System Factroy Reset - Hard | 8x 01 04 3F 03 01 FF | |
| CAM_Image_Mode | Default | 8x 01 04 3F 04 00 FF | Image Mode Default/Custom |
| | Custom | 8x 01 04 3F 04 01 FF | |
| CAM_Image_Load | Image Mode Load | 8x 01 04 3F 05 0p FF | p : Load Image mode - default to Custom (p=0) |
| CAM Prompt | On | 8x 01 04 07 00 02 FF | OSD Prompt ON/OFF |
| | Off | 8x 01 04 07 00 03 FF | |
| CAM_ColorHue | Direct | 8x 01 04 4F 00 00 0p 0q FF | pq: color Hue, pq:0x00~0x0F (* Enabled during Image Mode = Custom mode for Lumens used) |
| 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 |
| | Enter | 8x 01 7E 01 02 00 01 FF | menu enter |

| Command Set | Command | Command Packet | Comments |
|-----------------|-----------------|---|---|
| | Up | 8x 01 06 01 01 01 03 01 FF | menu up |
| | Down | 8x 01 06 01 01 01 03 02 FF | menu down |
| | Left | 8x 01 06 01 01 01 01 03 FF | menu left |
| | Right | 8x 01 06 01 01 01 02 03 FF | menu right |
| Tally Mode | Set Tally Mode | 8x 01 7E 01 0A 01 0p FF | p: 0: (Red:OFF Green:OFF) 4: (Red:Low light Green:OFF) - Tally Lamp must be Enabled 5: (Red:Highlight Green:OFF) - Tally Lamp must be Enabled |
| Tally_Lamp | On | 8x 01 7E 01 0A 00 02 FF | Tally Lamp ON/OFF |
| | Off | 8x 01 7E 01 0A 00 03 FF | |
| OSD_Cross_line | On | 8x 01 04 75 DD 04 02 FF | OSD Cross Line ON/OFF |
| | Off | 8x 01 04 75 DD 04 03 FF | |
| IP_DHCP_OnOff | On | 8x 01 7C 01 02 FF | Set DHCP ON/OFF |
| | Off | 8x 01 7C 01 03 FF | |
| IP_Address_IPv4 | Set IP Addresss | 8x 01 7C 02 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX), pq = 0~255, rs = 0~255, tu = 0~255, vx = 0~255, e.g. 192.168.100.150 => 81 01 7C 02 0C 00 0A 08 06 04 09 06 FF |
| IP_Netmask | Set Netmask | 8x 01 7C 03 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX), pq = 0~255, rs = 0~255, tu = 0~255, vx = 0~255, e.g. 255.255.255.0 => 81 01 7C 03 0F 0F 0F 0F 0F 00 00 FF |
| IP_Gateway | Set Getway | 8x 01 7C 04 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX), pq = 0~255, rs = 0~255, tu = 0~255, vx = 0~255, |

| Command Set | Command | Command Packet | Comments |
|--------------------|------------------------|--|--|
| | | | e.g. 192.168.100.254 => 81 01 7C 04 0C 00 0A 08 06 04 0F 0E FF |
| IP_Dns | Set DNS | 8x 01 7C 05 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX), pq = 0~255, rs = 0~255, tu = 0~255, vx = 0~255, e.g. 8.8.8.8 => 81 01 7C 05 00 08 00 08 00 08 00 08 FF |
| CAM_Audio_OnOff | On | 8x 01 04 68 02 FF | Audio ON/OFF |
| | Off | 8x 01 04 68 03 FF | |
| CAM_Audio_In_Type | Line In | 8x 01 04 6B 02 FF | Audio In Type |
| | Mic In | 8x 01 04 6B 03 FF | |
| CAM_Audio_Volume | Volume | 8x 01 04 6E 0p FF | p: 0x00~0x0A |
| CAM_UART_Baud_Rate | 9600 | 8x 01 04 24 00 00 00 FF | Baud rate |
| | 38400 | 8x 01 04 24 00 00 01 FF | |
| SERIAL_CTRL_TYPE | RS422 | 8x 01 04 53 45 52 49 41 4C 02 FF | RS422 |
| | RS232 | 8x 01 04 53 45 52 49 41 4C 03 FF | RS232 |
| SY_JOYSTICK | Non-SY_Joystick | 8x 01 04 11 03 00 FF | p: 0:Non-SY_Joystick 1: SY_Joystick |
| | SY_Joystick | 8x 01 04 11 03 01 FF | |
| CAM_Preset_AF | On | 8x 01 04 5E 02 FF | |
| | Off | 8x 01 04 5E 03 FF | |
| CAM_DZOOM_LIMIT | Set Digital Zoom Limit | 8x 01 04 26 0p FF | p: 0x00(x1) to 0x0B(x12) |
| CAM_Smart_AF | On | 8x 01 7E 01 01 02 FF | Face detection AF On |
| | Off | 8x 01 7E 01 01 03 FF | Face detection AF Off |

12 RS232 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_SystemStatusInq | 8x 09 04 00 01 FF | y0 50 00 FF | Ready |
| | | y0 50 01 FF | Processing |
| CAM_OpticalZoomPosInq | 8x 09 04 47 FF | y0 50 0p 0q 0r 0s FF | pqrs: Zoom Position , pqrs: 0x0000~0x7AC0 DZoomMode = Off, Zoom Position range : 0x0000 ~ 0x4000 DZoomMode = PixelZoom, Zoom Position range : 0x0000 ~ 0x6000 DZoomMode = On, Zoom Position range : 0x0000 ~ 0x7AC0 |
| CAM_ZoomMemoryModelInq | 8x 09 04 47 00 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| 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: parameters are in the General Zoom Focus Table near end to far end |
| CAM_CurveModelInq | 8x 09 04 38 03 FF | y0 50 02 FF | Curve tracking |
| | | y0 50 03 FF | Zoom tracking |
| AF SensitivityInq | 8x 09 04 58 FF | y0 50 01 FF | High |
| | | y0 50 02 FF | Middle |
| | | y0 50 03 FF | Low |
| AF FrameInq | 8x 09 04 5C FF | y0 50 01 FF | Auto |
| | | y0 50 02 FF | Full Frame |
| | | y0 50 03 FF | Center |
| Resolution SettingInq | 8x 09 06 23 FF | y0 50 0p 0q FF | pq:0x05:QFHD 4K(3840 x 2160) - 29.97p |
| | | | 0x06:QFHD 4K(3840 x 2160) - 25p |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|------------------------|----------------|----------------------|--------------------------------------|
| | | | 0x08:FHD 1080P(1920 x 1080) - 59.94p |
| | | | 0x09:FHD 1080P(1920 x 1080) - 50p |
| | | | 0x0B:FHD 1080P(1920 x 1080) - 29.97p |
| | | | 0x0C:FHD 1080P(1920 x 1080) - 25p |
| | | | 0x0E:HD 720P(1280 x 720) - 59.94p |
| | | | 0x0F:HD 720P(1280 x 720) - 50p |
| | | | 0x15:FHD 1080i(1920 x 1080) - 59.94i |
| | | | 0x16:FHD 1080i(1920 x 1080) - 50i |
| CAM_HdmiFormatInq | 8x 09 06 36 FF | y0 50 00 FF | RGB |
| | | y0 50 02 FF | YUV422 |
| CAM_HdmiOutputRangeInq | 8x 09 06 37 FF | y0 50 01 FF | 16~235 |
| | | y0 50 02 FF | 1~254 |
| 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 |
| | | y0 50 05 FF | Manual |
| | | y0 50 0C FF | Sodium Lamp |
| CAM_RGainInq | 8x 09 04 43 FF | y0 50 00 00 0p 0q FF | pq : R Gain, pq: 00 To 80 |
| CAM_BGainInq | 8x 09 04 44 FF | y0 50 00 00 0p 0q FF | pq : B Gain, pq: 00 To 80 |
| CAM_AEModelInq | 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 |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|-------------------------|----------------|----------------------|--|
| CAM_FlickerlessInq | 8x 09 04 3C FF | y0 50 00 FF | Off |
| | | y0 50 01 FF | 50Hz |
| | | y0 50 02 FF | 60Hz |
| 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 0F |
| CAM_GainPosInq | 8x 09 04 4C FF | y0 50 00 00 0p 0q FF | pq: Gain Position, pq: 00 To 0F |
| CAM_IrisLimitInq (Min.) | 8x 09 04 2B FF | y0 50 0q FF | p: IRIS Limit,p: 3 To C |
| CAM_IrisLimitInq (Max.) | 8x 09 04 2A FF | y0 50 0q FF | p: IRIS Limit,p: 3 To C |
| CAM_IllegalIrisOpenInq | 8x 09 04 2F FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_GainLimitInq | 8x 09 04 2C FF | y0 50 0q FF | p: Gain Limit,p: 3 To F |
| CAM_BrightPosInq | 8x 09 04 4D FF | y0 50 00 00 0p 0q FF | pq : Bright Position, pq: 00 To 0xF |
| CAM_ExpCompModelInq | 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 0A |
| CAM_BackLightModelInq | 8x 09 04 33 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_SpotAEModelInq | 8x 09 04 59 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_SpotAEPosInq | 8x 09 04 29 FF | y0 50 0p 0q 0r 0s FF | pq : X - axis, pq : 00 To 06 rs : Y - axis, rs : 00 To 04 |
| CAM_WDParameterInq | 8x 09 04 2D FF | y0 50 0p FF | p: WDR mode (p: 0 To 3) |
| CAM_ApertureInq | 8x 09 04 42 FF | y0 50 00 00 0p 0q FF | pq: Aperture Gain, pq: 00 To 0E |
| CAM_2DNRMModelInq | 8x 09 04 53 FF | y0 50 0p FF | p: NR Level Setting, p: 0 To 3 |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|---------------------------|----------------------|-------------------------------|---|
| CAM_3DNRMdeInq | 8x 09 04 54 FF | y0 50 0p FF | p: NR Level Setting, p: 0: OFF 1: Low 2: Type 3: Max |
| CAM_GammaInq | 8x 09 04 5B FF | y0 50 0p FF | Gamma p: 0 To 3 |
| CAM_LR_ReverseModelInq | 8x 09 04 61 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_RotationModelInq | 8x 09 04 67 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_ICRInq | 8x 09 04 01 FF | y0 50 02 FF | On (NIGHT) |
| | | y0 50 03 FF | Off (DAY) |
| CAM_MuteModelInq | 8x 09 04 75 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM Version Inq | 8x 09 00 02 FF | y0 50 pp qq rr ss jj jj kk FF | ppqq: Vender ID(0001) rrss: Model ID(0513) jjjj: Rom revision(0104) kk: Maximum socket(02) |
| CAM FW version Inq - Boot | 8x 09 00 02 00 00 FF | y0 50 mm nn oo pp qq rr ss FF | mmnnooppqrrss : XXXxxxx |
| CAM FW version Inq - CM0 | 8x 09 00 02 00 01 FF | y0 50 mm nn oo pp qq rr ss FF | mmnnooppqrrss : XXXxxxx |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|------------------------------|----------------------|---|--|
| CAM FW version Inq - RTOS | 8x 09 00 02 00 02 FF | y0 50 mm nn oo pp qq rr ss FF | mmnnooppqrrss : XXXxxxx |
| CAM FW version Inq - Linux | 8x 09 00 02 00 03 FF | y0 50 mm nn oo pp qq rr ss FF | mmnnooppqrrss : XXXxxxx |
| CAM FW version Inq - MCU | 8x 09 00 02 00 04 FF | y0 50 mm nn oo pp qq rr ss FF | mmnnooppqrrss : XXXxxxx |
| CAM FW version Inq - IQ | 8x 09 00 02 00 05 FF | y0 50 mm nn oo pp qq rr ss FF | mmnnooppqrrss : XXXxxxx |
| CAM FW version Inq - CTRL_BD | 8x 09 00 02 00 06 FF | y0 50 mm nn oo pp qq rr ss FF | mmnnooppqrrss : XXXxxxx |
| CAM FW version Inq - CPLD | 8x 09 00 02 00 07 FF | y0 50 mm nn oo pp qq rr FF | mmnnooppqrrss : XXXxxxx |
| 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 |
| Pan-tiltPosInq | 8x 09 06 12 FF | y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF | www: Pan Position: 0x0000 to 0x6A40 & 0x95C0 to 0xFFFF (center 0000) zzzz: Tilt Position: 0x0000 to 0x3840 & 0xED40 to 0xFFFF (center 0000) |
| CAM Image ModelInq | 8x 09 04 3F 04 FF | y0 50 00 FF | Default |
| | | y0 50 01 FF | Custom |
| Prompt Inq | 8x 09 04 07 00 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM SERIAL INQ | 8x 09 02 18 FF | y0 50 aa bb cc dd ee ff gg hh ii FF | aa bb cc dd ee ff gg hh ii : Serial Number (ASCII) |
| MAC_Address_Read | 8x 09 04 78 FF | y0 50 0a 0b 0c 0d 0e 0f 0g 0h 0i 0j 0k 0l FF | MAC Address = ab: cd: ef: gh: ij: kl |
| Tally Mode Inq | 8x 09 7E 01 0A 01 FF | y0 50 0p FF | p: 0: (Red:OFF Green:OFF) 4: (Red:Low light Green:OFF) - Tally Lamp must be Enabled 5: (Red:Highlight Green:OFF) - Tally Lamp must be Enabled 6: (Red:OFF Green:Highlight) - Tally Lamp must be Enabled |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|---------------------------------|----------------------|---|---|
| | | | 7: (Red:Highlight Green:Highlight) - Tally Lamp must be Enabled |
| Tally Lamp Inq | 8x 09 7E 01 0A 00 FF | y0 50 0p FF | p: 2 Enable 3: Disable |
| CAM ID INQ | 8x 09 7E CE FF | y0 50 aa bb cc dd ee ff gg hh ii jj kk ll FF | aa bb cc dd ee ff gg hh ii jj kk ll : Camera ID (ASCII) |
| CAM_ColorGainInq | 8x 09 04 49 FF | y0 50 00 00 0p 0q FF | pq: Color Gain setting , pq: 0x00 To 0x0F |
| CAM_ColorHueInq | 8x 09 04 4F FF | y0 50 00 00 0p 0q FF | pq: Color Hue setting , pq: 0x00 To 0x0F |
| CAM_ErrCodeROM_01_10 Inq | 8x 09 00 02 02 00 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 1~10 |
| CAM_ErrCodeROM_11_20 Inq | 8x 09 00 02 02 01 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 11~20 |
| CAM_ErrCodeROM_21_30 Inq | 8x 09 00 02 02 02 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 21~30 |
| CAM_ErrCodeROM_31_40 Inq | 8x 09 00 02 02 03 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 31~40 |
| CAM_ErrCodeROM_41_50 Inq | 8x 09 00 02 02 04 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 41~50 |
| CAM_ErrCodeCurrent_01_10 Inq | 8x 09 00 02 03 00 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 1~10 |
| CAM_ErrCodeCurrent_11_20 Inq | 8x 09 00 02 03 01 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 11~20 |
| CAM_ErrCodeCurrent_21_30 Inq | 8x 09 00 02 03 02 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 21~30 |
| CAM_ErrCodeCurrent_31_40 Inq | 8x 09 00 02 03 03 FF | y0 50 aa bb cc dd ee ff gg hh ii kk FF | aa~kk : error code count --> 31~40 |
| CAM_ErrCodeCurrent_41_50 Inq | 8x 09 00 02 03 04 FF | y0 50 aa bb cc dd ee ff gg hh ii kk | aa~kk : error code count --> 41~50 |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|---------------------|-------------------|----------------------------------|-----------------------------|
| Inq | | FF | |
| IP_DHCP_OnOff_Inq | 8x 09 7C 01 FF | y0 50 0p FF | p: 2: ON, 3: OFF |
| IP_Address_IPv4_Inq | 8x 09 7C 02 FF | y0 50 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX) |
| IP_Netmask_Inq | 8x 09 7C 03 FF | y0 50 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX) |
| IP_Getway_Inq | 8x 09 7C 04 FF | y0 50 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX) |
| IP_Dns_Inq | 8x 09 7C 05 FF | y0 50 0p 0q 0r 0s 0t 0u 0v 0x FF | address : pq.rs.tu.vx (HEX) |
| CAM_Audio_OnOff_Inq | 8x 09 04 68 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_AudioInType_Inq | 8x 09 04 6B FF | y0 50 02 FF | Line In |
| | | y0 50 03 FF | Mic In |
| CAM_AudioVolumeInq | 8x 09 04 6E FF | y0 50 0p FF | p: Volume , p: 0x0 To 0xA |
| CAM_UartBaudRateInq | 8x 09 04 24 00 FF | y0 50 00 00 FF | 9600 bps |
| | | y0 50 00 01 FF | 38400 bps |
| | | y0 50 00 02 FF | 115200 bps |
| CAM_AE_SPEED_INQ | 8x 09 04 5D FF | y0 50 0p FF | p: Speed index,p:0x1 to 0x3 |
| CAM_Preset_AF_inq | 8x 09 04 5E FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_Smart_AF_inq | 8x 09 7E 01 01 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |

13 Block Inquiry Command List

13.1 CAM_Lens_Control_BlockInq

| bit | Inquiry Packet | | | | | | | | | | | | | | | | |
|-----|----------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|---|---|---------------------------|---------------------------|---------------------------|---------------------------|----|---|----|----|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| 7 | Destinat ion Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 6 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 5 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 3 | Source Address | 0 | Zoom Position (HH) | Zoom Position (HL) | Zoom Position (LH) | Zoom Position (LL) | 0 | 0 | Focus Position (HH) | Focus Position (HL) | Focus Position (LH) | Focus Position (LL) | 0 | 0 | 0 | 1 | |
| 2 | | 0 | | | | | 0 | 0 | | | | | 0 | 1 | | | |
| 1 | | 0 | | | | | 0 | 0 | | | | | 0 | Digital Zoom 0:Off 1:On | 0 | 0 | 1 |
| 0 | | 0 | | | | | 0 | 0 | | | | | 0 | Focus Mode 0:Manu al 1:Auto | 0 | 0 | 1 |

13.2 CAM_Camera_Control_BlockInq

| bit | Inquiry Packet | | | | | | | | | | | | | | | |
|-----|----------------------------|---|---------------|---------------|---------------|---------------|------------|------------------|------------------|------------------------------------|----------------------|------------------|------------------|-------------------------------|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | Destinati on Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 6 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WDR 0:Off 1:On | 0 | 0 | 0 | 0 | 0 |
| 3 | Source Address | 0 | R Gain (H) | R Gain (L) | B Gain (H) | B Gain (L) | WB Mode | Aperture Gain | Exposure Mode | Spot AE 0:Off 1:On | Shutter Position | Iris Position | Gain Position | Exposure Comp. Position | 0 | 1 |
| 2 | | 0 | | | | | | | | Backlight 0:Off 1:On | | | | | 0 | 1 |
| 1 | | 0 | | | | | | | | Exposure Comp. 0:Off 1:On | | | | | 0 | 1 |
| 0 | | 0 | | | | | | | | Slow Shutter 0:Off 1:On | | | | | 0 | 1 |

13.3 CAM_Other_BlockInq

| bit | Inquiry Packet | | | | | | | | | | | | | | | | |
|-----|----------------------------|---|---------------------------|--------------------------------|---|---------------------------|---|---|---|---|----|----|----|--|----|----|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| 7 | Destinati on Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 6 | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 5 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4 | | 1 | 1 | ICR 0:Off 1:On | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Memory 1:Provid ed 0:Not provided | 0 | 0 | 1 |
| 3 | Source Address | 0 | 0 | 0 | 0 | Picture Effect Mode | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 2 | | 0 | Auto ICR 0:Off 1:On | LR Reverse 0:Off 1:On | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ICR 1:Provid ed 0:Not provided | 0 | 0 | 1 |
| 1 | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | | 0 | Power 0:Off 1:On | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | System 1:1/50, 1/25 0:1/59.9 4, 1/29.97 | 0 | 0 | 1 |

13.4 CAM_Extended_1_BlockInq

| bit | Inquiry Packet | | | | | | | | | | | | | | | | | | |
|-----|---------------------|---|---|---|---|---|---|---|----------------------|----------------------|----|-----------------------|------------------------------|-------|----|------------|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | | |
| 7 | Destination Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | | |
| 6 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Color Gain | 0 | Gamma | 0 | 1 | | | |
| 5 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 1 | | |
| 4 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | | |
| 3 | Source Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Spot AE Position (X) | Spot AE Position (Y) | 0 | Flip 0:Off 1:On | 1:Provided 0:Not provided | 0 | 0 | Gain Limit | 1 | | |
| 2 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | | | | | 0 | 0 | 1 |
| 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | | | | | 0 | 0 | 1 |
| 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | | | | | 0 | 0 | 0 |

13.5 CAM_Extended_2_BlockInq

| bit | Inquiry Packet | | | | | | | | | | | | | | | |
|-----|------------------------|---|--------------|---|---|---|---|---|---|---|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | Destination Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 6 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3 | Source Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2 | | 0 | WDR Index | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

13.6 CAM_Extended_3_BlockInq

| bit | Inquiry Packet | | | | | | | | | | | | | | | |
|-----|------------------------|---|--------------|---|---|---|---|---|---|---|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | Destination Address | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 6 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3 | Source Address | 0 | Color Hue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

14 RS232 over IP

14.1 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:

14.2 Interface

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

14.3 Internet protocol

IPv4

14.4 Transport protocol

UDP

14.5 IP address

Set by the IP card setting command

14.6 Port address

52381

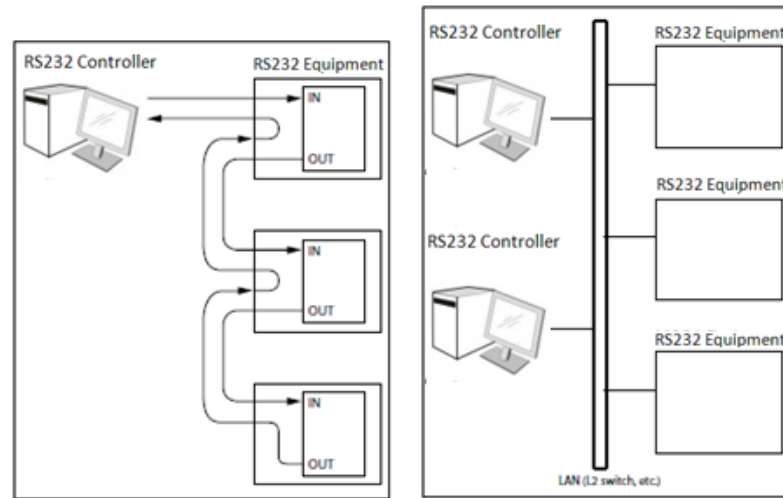
14.7 Delivery confirmation/Retransmission control

Depends on the application

14.8 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).

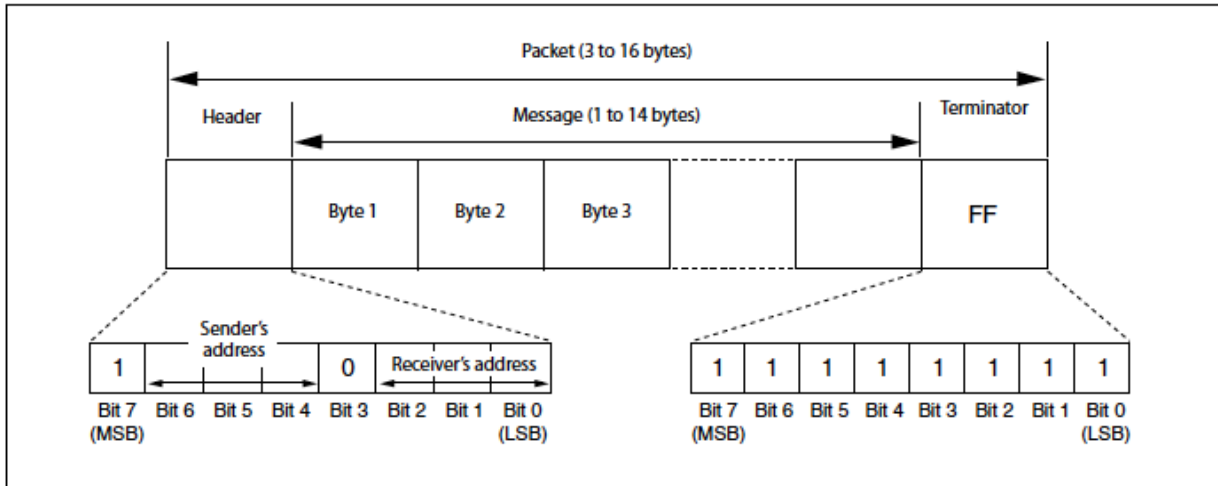
14.9 Packet Structure

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.

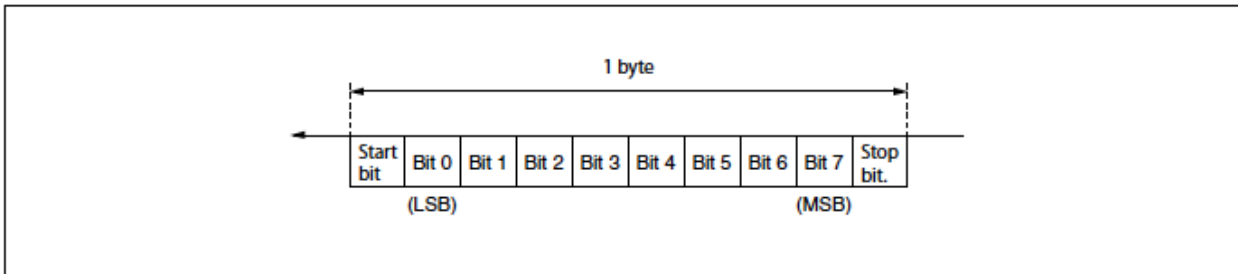
*The broadcast function is not available for VISCA over IP.



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

15 Communication method of VISCA over IP

15.1 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.

15.2 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.

15.3 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.

15.4 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.

15.5 VISCA device setting command

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

15.6 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.

15.7 IF_Clear

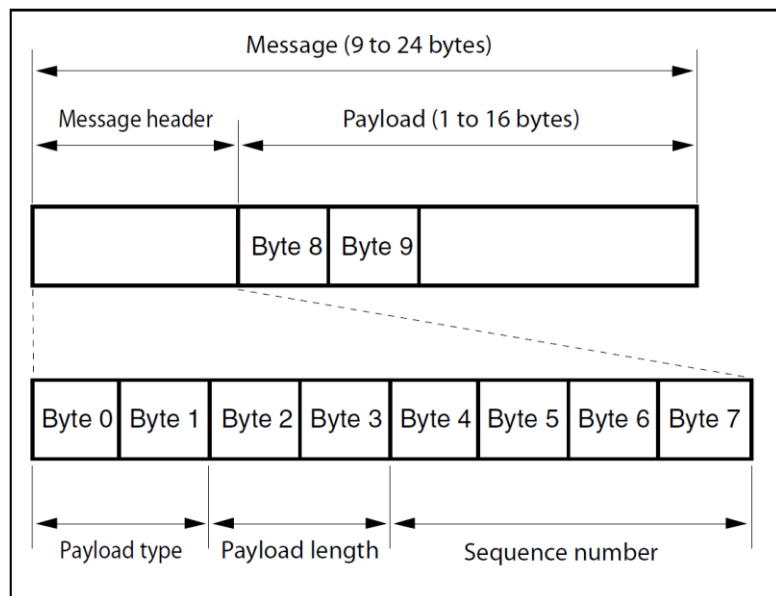
Sends the reply message to the controller after clearing, without using VISCA socket.

15.8 CAM_VerslonInq

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

15.9 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

Example:

| Command | Payload type | | Payload length | | Sequence number | | | | Payload (1~16Byte) | | | | | | | | | | |
|--------------------|--------------|--------|----------------|--------|-----------------|--------|--------|--------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|-----|---------|
| | Byte 0 | Byte 1 | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 1 | Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Byte 8 | Byte 9 | ... | Byte 16 |
| CAM_Power On | 01 | 00 | 00 | 06 | 00 | 00 | 00 | 01 | 81 | 01 | 04 | 00 | 02 | FF | | | | | |
| Pan-tiltDrive Up | 01 | 00 | 00 | 09 | 00 | 00 | 00 | 02 | 81 | 01 | 06 | 01 | 0C | 0C | 03 | 01 | FF | | |
| Pan-tiltDrive Down | 01 | 00 | 00 | 09 | 00 | 00 | 00 | 03 | 81 | 01 | 06 | 01 | 0C | 0C | 03 | 02 | FF | | |
| CAM_FocusModelInq | 01 | 10 | 00 | 5 | 00 | 00 | 00 | 04 | 81 | 9 | 4 | 38 | FF | | | | | | |

15.10 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

15.11 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

15.12 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.

15.13 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. |

15.14 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.

16 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) WW : Pan speed 0x01 (low speed) to 0x18 (high speed) |
| 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 | |
| Riight -Down | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x12 | 0xVV | 0xWW | Checksum | |
| Left - Down | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x14 | 0xVV | 0xWW | Checksum | |
| Zoom Tele Down | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x30 | 0xVV | 0xWW | Checksum | |
| Zoom Tele Up | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x28 | 0xVV | 0xWW | Checksum | |
| Zoom Tele Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x24 | 0xVV | 0xWW | Checksum | |
| Zoom Tele Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x22 | 0xVV | 0xWW | Checksum | |
| Zoom Tele Up-Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x2C | 0xVV | 0xWW | Checksum | |
| Zoom Tele Up-Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x2A | 0xVV | 0xWW | Checksum | |
| Zoom Tele Down-Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x34 | 0xVV | 0xWW | Checksum | |
| Zoom Tele Down-Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x32 | 0xVV | 0xWW | Checksum | |
| Zoom Wide Down | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x50 | 0xVV | 0xWW | Checksum | |
| Zoom Wide Up | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x48 | 0xVV | 0xWW | Checksum | |
| Zoom Wide Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x44 | 0xVV | 0xWW | Checksum | |
| Zoom Wide Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x42 | 0xVV | 0xWW | Checksum | |

| Internal Command | Byte 1 | Byte 2 (Address) | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Comments |
|----------------------|--------|------------------|--------|--------|--------|--------|----------|----------|
| Zoom Wide Up-Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x4C | 0xVV | 0xWW | Checksum | |
| Zoom Wide Up-Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x4A | 0xVV | 0xWW | Checksum | |
| Zoom Wide Down-Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x54 | 0xVV | 0xWW | Checksum | |
| Zoom Wide Down-Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x52 | 0xVV | 0xWW | Checksum | |
| FOCUS Far Down | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x90 | 0xVV | 0xWW | Checksum | |
| FOCUS Far Up | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x88 | 0xVV | 0xWW | Checksum | |
| FOCUS Far Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x84 | 0xVV | 0xWW | Checksum | |
| FOCUS Far Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x82 | 0xVV | 0xWW | Checksum | |
| FOCUS Far Up-Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x8C | 0xVV | 0xWW | Checksum | |
| FOCUS Far Up-Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x8A | 0xVV | 0xWW | Checksum | |
| FOCUS Far Down-Left | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x94 | 0xVV | 0xWW | Checksum | |
| FOCUS Far Down-Right | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x92 | 0xVV | 0xWW | Checksum | |
| FOCUS Near Down | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x10 | 0xVV | 0xWW | Checksum | |
| FOCUS Near Up | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x08 | 0xVV | 0xWW | Checksum | |
| FOCUS Near Left | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x04 | 0xVV | 0xWW | Checksum | |
| FOCUS Near Right | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x02 | 0xVV | 0xWW | Checksum | |

| Internal Command | Byte 1 | Byte 2 (Address) | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Comments |
|--|--------|------------------|--------|--------|--------|--------|----------|--------------------------------------|
| FOCUS Near Up-Left | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x0C | 0xVV | 0xWW | Checksum | |
| FOCUS Near Up-Right | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x0A | 0xVV | 0xWW | Checksum | |
| FOCUS Near Down-Left | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x14 | 0xVV | 0xWW | Checksum | |
| FOCUS Near Down-Right | 0xFF | 0x00 ~ 0xFF | 0x01 | 0x12 | 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); | | | | | | | | |

17 PelcoD External Command List

17.1 External Command

| External 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 0xFF) |
| 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 Off: 0x02 | Checksum | System Menu On/Off |
| ENTER | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x49 | 0x00 | 0x00 | Checksum | Menu Enter |

| External Command | Byte 1 | Byte 2 (Address) | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Comments |
|------------------------------|--------|------------------|--------|--------|--------|---|----------|--|
| 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 |

17.2 Query Command

| Query Command | Byte 1 | Byte 2 (Address) | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Comments |
|------------------------------|--------|------------------|--------|--------|--------|--------|----------|-----------------------------|
| Query Command Package | | | | | | | | |
| 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 MIRROR | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x67 | 0x00 | 0x00 | Checksum | Get Mirror & Flip Status |

| Query Command | Byte 1 | Byte 2 (Address) | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 | Comments |
|--|--------|------------------|--------|--------|--------|---|----------|---|
| Query FREEZE | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x69 | 0x00 | 0x00 | Checksum | Get Freeze Status |
| Query Ack Package | | | | | | | | |
| Query Pan Response | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x59 | 0x pq | 0x rz | Checksum | pqrz: Pan Position 0x0000 to 0x06A4 & 0xF95C to 0xFFFF (center 0000) |
| Query Tilt Response | 0xFF | 0x00 ~ 0xFF | 0x00 | 0x5B | 0x pq | 0x rz | Checksum | pqrz: Tilt Position 0x0000 to 0x0384 & 0xFED4 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); | | | | | | | | |