



# **Harrier 10x Autofocus-Zoom Global Shutter Camera (LVDS/CVBS)**

## **AS-CAM-10LGHD-A**

### **Technical Reference Manual**

Edition: v1.01

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## Contents

|                                         |           |
|-----------------------------------------|-----------|
| <b>FEATURES .....</b>                   | <b>3</b>  |
| <b>CAUTIONS.....</b>                    | <b>4</b>  |
| <b>SPECIFICATIONS.....</b>              | <b>5</b>  |
| <b>CONNECTORS .....</b>                 | <b>8</b>  |
| <b>INTERFACE .....</b>                  | <b>11</b> |
| <b>LVDS RECEIVER CIRCUITS .....</b>     | <b>12</b> |
| <b>CABLE SPECIFICATIONS .....</b>       | <b>14</b> |
| <b>TIMING CHARTS .....</b>              | <b>16</b> |
| <b>PIXEL DATA FORMAT .....</b>          | <b>19</b> |
| <b>BLOCK DIAGRAM.....</b>               | <b>20</b> |
| <b>RELIABILITY .....</b>                | <b>21</b> |
| <b>FUNCTIONS.....</b>                   | <b>23</b> |
| <b>PROTOCOL .....</b>                   | <b>30</b> |
| <b>VISCA COMMAND LIST .....</b>         | <b>35</b> |
| <b>VISCA INQUIRY COMMAND LIST .....</b> | <b>42</b> |
| <b>OSD MENU .....</b>                   | <b>51</b> |
| <b>CAMERA DIMENSIONS .....</b>          | <b>67</b> |
| <b>APPROVALS .....</b>                  | <b>68</b> |
| <b>ORDERING INFORMATION .....</b>       | <b>68</b> |

## FEATURES

- **1/3.1" Sony STARVIS CMOS sensor**

3.28M Pixels (Total) / 3.20M Pixels (Active)

- **10x Optical Zoom**

Built-in 10x optical zoom lens is highly reliable.  
It features auto focus, auto iris, auto D&N, zoom function.

- **Full HD Resolution**

1920x1080p – 60/50/30/25 fps  
1280x720p – 60/50/30fps/25 fps

- **DAY & NIGHT (ICR)**

The ICR will automatically engage depending on the ambient light, allowing the camera to be effective in day & night environment.

- **DNR (Digital Noise Reduction, 2D+3D)**

The DNR technology eliminates noise thus generating a distinct and clear image. This camera DNR function utilizes both an adaptive 2D filter reducing noise in the brightness of the image and an adaptive 3D filter reducing noise caused by movement.

- **Privacy Mask Function**

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

- **On Screen Display**

This camera can be controlled by selecting text/menu items displayed on the monitor screen.

- **Intelligent Motion Detection**

Can transmit an alert signal when motion of an object on the screen is detected. This feature is useful when you have to monitor several screens simultaneously.

- **Digital Image Stabilizer (DIS)**

The Image Stabilizer function reduces image blurring caused by, for example, vibration.

- **Output**

Digital output: LVDS  
Analog output: CVBS (NTSC, PAL Composite)

- **Protocol**

This camera supports VISCA, PELCO-D, PELCO-P.



## CAUTIONS

### ● Power supply

This camera must always be operated in the range 9V to 15V DC

### ● Handling of the unit

Be careful not to spill water or other liquids on the unit.

Be cautious not to get combustible or metallic material inside the body.

If used with foreign matter inside, the camera is liable to fail or to get cause of fire or electric shock.

### ● Operating and storage location

Avoid viewing a very bright object (such as light fittings) during an extended period. Avoid operating or storing the unit in the following locations.

- ▶ Extremely hot or cold places (operating temperature  $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$ , however, we recommend that the unit be used within a temperature range of  $0^{\circ}\text{C} \sim 45^{\circ}\text{C}$ )
- ▶ Damp or dusty places
- ▶ Places exposed to rain
- ▶ Places subject to strong vibration
- ▶ Close to generators of powerful electromagnetic radiation such as radio or TV transmitters.

### ● Care of the unit

Remove dust or dirt on the surface of the lens with a blower (commercially available).

Avoid the use of volatile solvents such as thinners, alcohol, benzene and insecticides. They may damage the surface finish and/or impair the operation of the camera.



## SPECIFICATIONS

| Model                       | AS-CAM-10LGHD-A                                                               |                                                                |        |        |
|-----------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------|--------|--------|
| Image Sensor                | 1/3.1" Sony IMX900AQR-C CMOS Sensor                                           |                                                                |        |        |
| Total Pixels                | 2064(H) x 1592(V) = 3.28M Pixels                                              |                                                                |        |        |
| Effective/Active pixels     | 2064(H) x 1552(V) = 3.20M Pixels                                              |                                                                |        |        |
| Scanning system             | Progressive Scan                                                              |                                                                |        |        |
| Shutter System              | Global Shutter                                                                |                                                                |        |        |
| Sync. System                | Internal                                                                      |                                                                |        |        |
| Resolution                  | Digital: 1080p 60/50/30/25 fps, 720p 60/50/30/25 fps<br>Analog: CVBS PAL/NTSC |                                                                |        |        |
| Min. illumination           | Color: (1/30s, 48dB): 0.1 lux<br>Color DSS: (1/1s, 48dB): 0.01 lux            | BW: (1/30s, 48dB): 0.01 lux<br>BW DSS: (1/1s, 48dB): 0.001 lux |        |        |
| Video Output                | HD: LVDS,<br>Analog: CVBS                                                     |                                                                |        |        |
| S/N Ratio                   | more than 50dB (AGC off)                                                      |                                                                |        |        |
| Lens                        |                                                                               |                                                                |        |        |
| Lens type                   | 10x Day & Night Zoom Lens                                                     |                                                                |        |        |
| Zoom Ratio                  | Optical x10, Digital x32 Zoom                                                 |                                                                |        |        |
| Focal Length                | f = 4.7mm ~ 47.0mm                                                            |                                                                |        |        |
| Aperture Ratio              | F1.7 (wide) ~ F3.1 (tele)                                                     |                                                                |        |        |
| Angle of View (D, H, V)     | Wide                                                                          | 53.94°                                                         | 47.84° | 28.02° |
|                             | Tele                                                                          | 6.96°                                                          | 6.07°  | 3.41°  |
| Function                    |                                                                               |                                                                |        |        |
| Trigger                     |                                                                               |                                                                |        |        |
| Trigger Mode                | Free run / Ext-trigger                                                        |                                                                |        |        |
| Trigger Polarity            | Active Low / Active High                                                      |                                                                |        |        |
| Trigger Delay               | 0 ~ 255.9ms                                                                   |                                                                |        |        |
| Strobe Polarity             | Active Low / Active High                                                      |                                                                |        |        |
| Strobe Delay                | Ext-Trigger : 0 ~ 255.9ms / Free run : 0 ~ (1V period – Width)ms              |                                                                |        |        |
| Strobe Width                | Ext-Trigger : 0 ~ 255.9ms / Free run : 0 ~ (1V period – Delay)ms              |                                                                |        |        |
| Shutter Speed (Ext-trigger) | 1/30(25) ~ 1/40,000 sec                                                       |                                                                |        |        |
| AGC (Ext-trigger)           | 0 ~ 10 steps                                                                  |                                                                |        |        |
| Iris (Ext-trigger)          | Close ~ F1.7                                                                  |                                                                |        |        |
| Day&Night (Ext-trigger)     | Day / Night                                                                   |                                                                |        |        |
| Zoom/Focus                  |                                                                               |                                                                |        |        |
| Mode                        | Auto / One Push / Manual                                                      |                                                                |        |        |
| Distance                    | 1.0 / 2.0 / 3.0 / 5.0 / 10.0 m                                                |                                                                |        |        |
| Zoom Speed                  | 0(Slow) ~ 7(Fast)                                                             |                                                                |        |        |
| Lens Refresh                | One Push / 1day ~ 10days                                                      |                                                                |        |        |
| D.Zoom                      | Off / MAX 2x ~ 32x                                                            |                                                                |        |        |
| Zoom Preset                 | 5 preset                                                                      |                                                                |        |        |



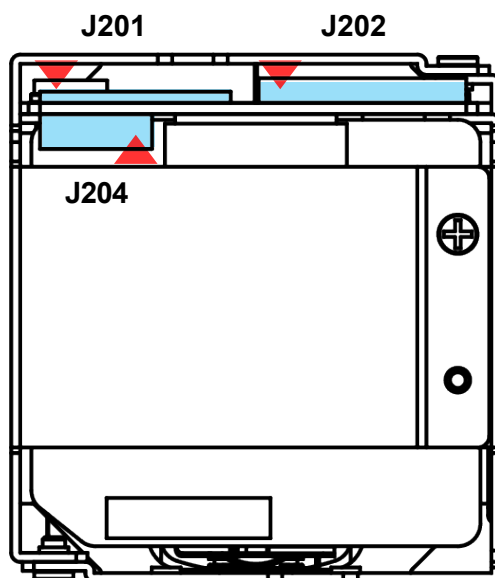
| Model                      | AS-CAM-10LGHD-A                                                     |
|----------------------------|---------------------------------------------------------------------|
| Exposure                   |                                                                     |
| Mode                       | Auto / Iris. Priority / Shut. Priority / Manual                     |
| Gain Control (AGC)         | 0 ~ 10 steps                                                        |
| Shutter Speed              | 1/1 ~ 1/40,000 sec                                                  |
| Iris                       | Close ~ F16                                                         |
| Digital Slow Shutter (DSS) | Off / 2x / 4x / 8x / 16x / 32x (/64x : 60 or 50fps mode only)       |
| Flickerless                | Off / On                                                            |
| Brightness                 | 0 ~ 14 steps                                                        |
| Back Light                 | OFF / BLC / HLC                                                     |
| Day&Night                  | Auto / Day / Night / Ext-in                                         |
| Night Function Set         | OFF / ON                                                            |
| White Balance              |                                                                     |
| Mode                       | Auto / One Push / Manual / Indoor / Outdoor / Auto-Ext              |
| Red Gain                   | 0 ~ 100 steps (Manual mode only)                                    |
| Blue Gain                  | 0 ~ 100 steps (Manual mode only)                                    |
| Chroma                     | 0 ~ 20 steps                                                        |
| Hue                        | 0 ~ 20 steps                                                        |
| Image                      |                                                                     |
| DNR                        | 2D/3D, 2D+3D (Level : 0 ~ 15 steps)                                 |
| Mirror                     | Off / H / V / H&V                                                   |
| Sharpness                  | 0 ~ 15 steps                                                        |
| Contrast                   | 0 ~ 20 steps                                                        |
| Image Bright               | 0 ~ 20 steps                                                        |
| DWDR                       | Off / Manual / Auto                                                 |
| Defog                      | Off / Manual / Auto                                                 |
| Freeze                     | Off / On                                                            |
| Gamma                      | 0.35 ~ 0.70                                                         |
| Intelligence               |                                                                     |
| Privacy Mask               | Off / On (8 masks)                                                  |
| Motion Detection           | Off / On (4 regions)                                                |
| Digital Image Stabilizer   | Off / On                                                            |
| Special Function           |                                                                     |
| Defect Detect              | Off / On                                                            |
| System                     | NTSC / PAL                                                          |
| HD Format                  | 1080p/30(25)fps / 1080p/60(50)fps / 720p/30(25)fps / 720p/60(50)fps |
| EX-SDI                     | Off / On                                                            |
| Communication              | ID: 1 ~ 255                                                         |
|                            | Baud Rate: 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200      |
|                            | Protocol: Pelco-P / Pelco-D / VISCA                                 |
| Display                    |                                                                     |
| Disp Sel (Off / On)        | ID / Title / Zoom Ratio / System Message                            |
| Set Title                  | Text Edit                                                           |
| Init Sel (Off / On)        | ID / Baud Rate / Protocol / Version / Init. Message                 |
| Set Init Msg               | Text Edit                                                           |



|                         |                                              |
|-------------------------|----------------------------------------------|
| <b>Model</b>            | <b>AS-CAM-10LGHD-A</b>                       |
| <b>Electrical</b>       |                                              |
| Power Source            | 9V to 15V DC                                 |
| Power Consumption       | 420mA (@ 12VDC)                              |
| <b>General</b>          |                                              |
| Power Input             | J201/J202 Connector                          |
| Video Output            | LVDS - J201 Connector, CVBS – J202 Connector |
| Operating Temperature   | -10°C ~ +50°C (Humidity: 0%RH ~ 90%RH)       |
| Storage Temperature     | -20°C ~ +60°C (Humidity: 0%RH ~ 90%RH)       |
| External Dimension (mm) | 66(L) x 43.6(W) x 47(H) mm                   |
| Weight                  | 165g                                         |



## CONNECTORS



| J201    |                        |          |         |            |           |
|---------|------------------------|----------|---------|------------|-----------|
| Pin No. | Name                   | Level    | Pin No. | Name       | Level     |
| 1       | TXOUT3+                |          | 16      | DC IN      | 9-15V DC  |
| 2       | TXOUT3-                |          | 17      | DC IN      | 9-15V DC  |
| 3       | TXCLKOUT+              |          | 18      | DC IN      | 9-15V DC  |
| 4       | TXCLKOUT-              |          | 19      | GND        |           |
| 5       | TXOUT2+                |          | 20      | GND        |           |
| 6       | TXOUT2-                |          | 21      | TXOUT7+    |           |
| 7       | TXOUT1+                |          | 22      | TXOUT7-    |           |
| 8       | TXOUT1-                |          | 23      | TXOUT6+    |           |
| 9       | TXOUT0+                |          | 24      | TXOUT6-    |           |
| 10      | TXOUT0-                |          | 25      | TRIG_IN    | 3.3V CMOS |
| 11      | GND                    |          | 26      | STROBE_OUT | 3.3V CMOS |
| 12      | TxD                    | 5V CMOS  | 27      | TXOUT5+    |           |
| 13      | RxD                    | 5V CMOS  | 28      | TXOUT5-    |           |
| 14      | DC IN                  | 9-15V DC | 29      | TXOUT4+    |           |
| 15      | DC IN                  | 9-15V DC | 30      | TXOUT4-    |           |
| Ref     | USL00-30L-C (KEL Cop.) |          |         |            |           |



| J202    |                        |                               |         |          |                      |
|---------|------------------------|-------------------------------|---------|----------|----------------------|
| Pin No. | Name                   | Level                         | Pin No. | Name     | Level                |
| 1       | GND                    |                               | 13      | 485-DIR  | RS485 control signal |
| 2       | TxD                    | 5V CMOS                       | 14      | NC       |                      |
| 3       | RxD                    | 5V CMOS                       | 15      | GND      |                      |
| 4       | TRIG_IN                | 3.3V CMOS                     | 16      | +5V      |                      |
| 5       | GND                    |                               | 17      | GND      |                      |
| 6       | STROBE_OUT             | 3.3V CMOS                     | 18      | CVBS-OUT | Composite Video      |
| 7       | GND                    |                               | 19      | GND      |                      |
| 8       | ADKEY                  | OSD Menu Control              | 20      | DC IN    | 9-15V DC             |
| 9       | NC                     |                               | 21      | DC IN    | 9-15V DC             |
| 10      | DAY/NIGHT-IN           | Normal : Open,<br>Active : 0V | 22      | DC IN    | 9-15V DC             |
| 11      | NC                     |                               | 23      | DC IN    | 9-15V DC             |
| 12      | MD-OUT                 | Motion Detect O/P             | 24      | DC IN    | 9-15V DC             |
| Ref     | 05002HR-24J05 (YEONHO) |                               |         |          |                      |

| J204    |                        |         |        |
|---------|------------------------|---------|--------|
| Pin No. | Name                   | Pin No. | Name   |
| 1       | VS_OUT                 | 5       | VS_IN  |
| 2       | HS_OUT                 | 6       | HS_IN  |
| 3       | CLK_OUT                | 7       | CLK_IN |
| 4       | GND                    | 8       | GND    |
| Ref     | SM08B-SRSS-TB-08 (JST) |         |        |

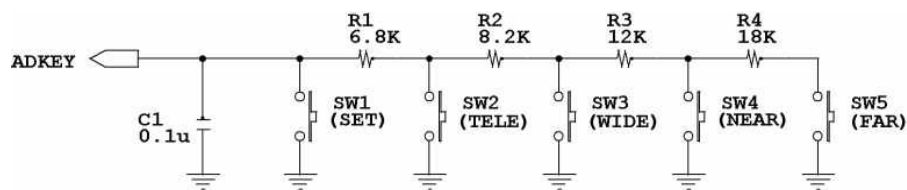
## 1. D&N IN (J202-10)

Port giving input of any external signal in Day&Night “Ext-In” Mode

- Day Mode: High (+3.3V)
- Night Mode: Low (Ground)

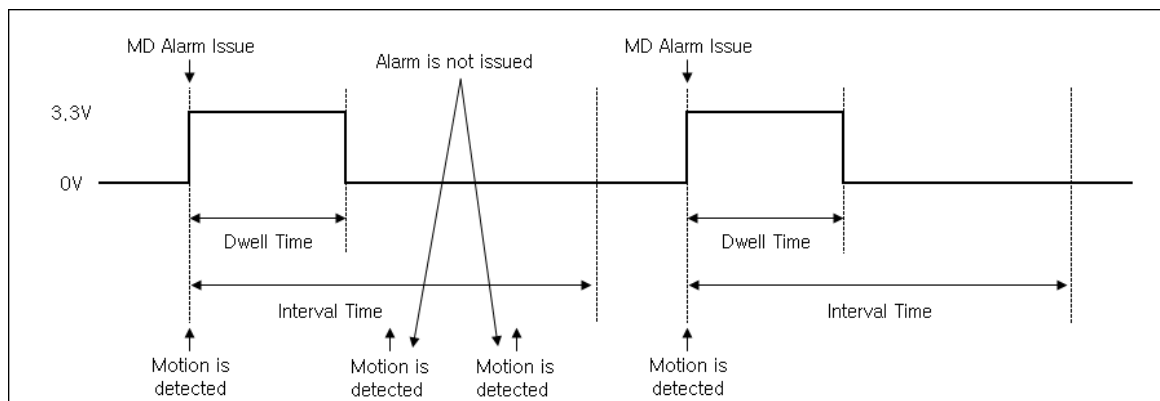
## 2. AD KEY (J202-8)

The external wired remote controller connector.



## 3. MD (J202-12)

Port giving signal output of Motion Detection Alarm

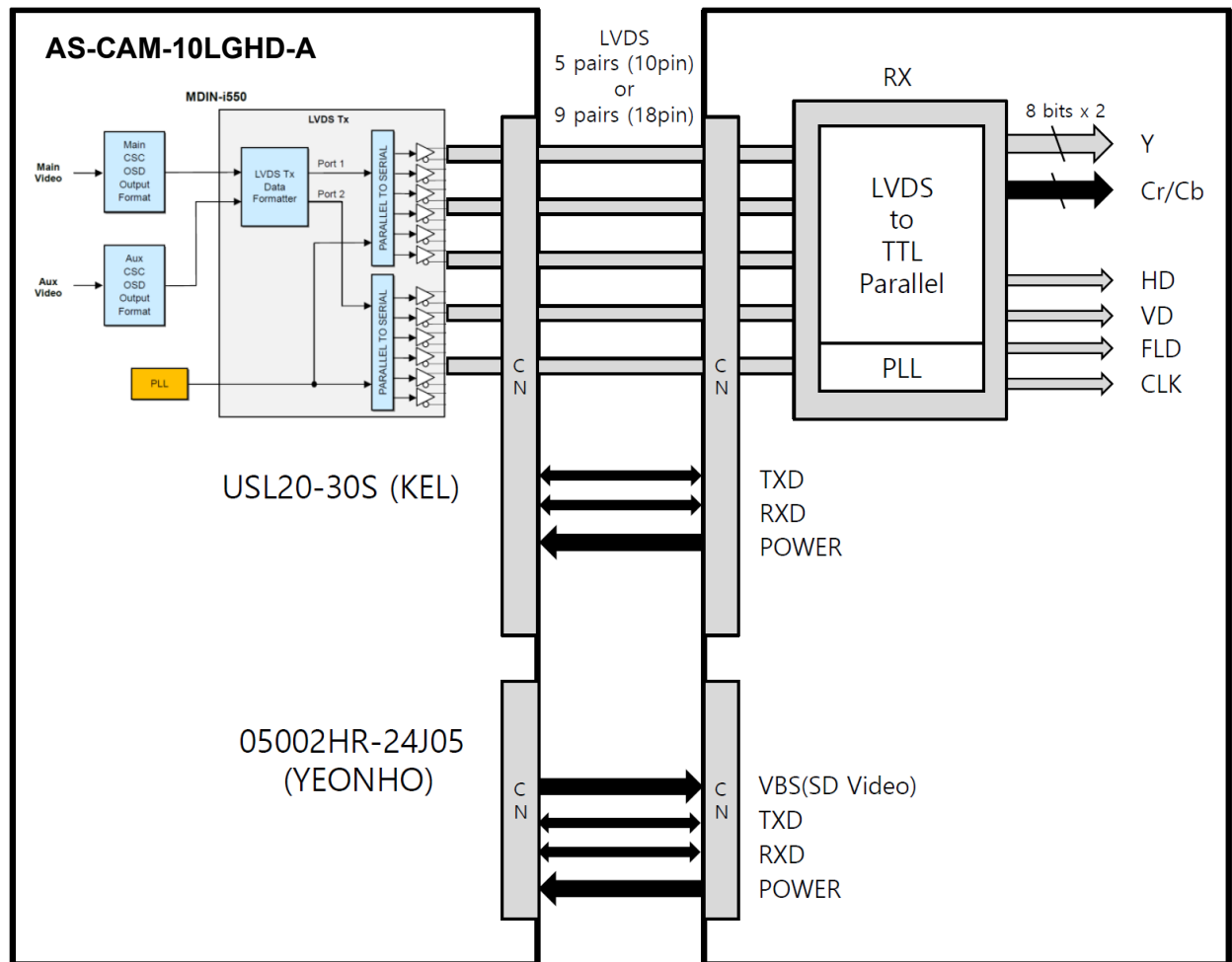


## 4. 485-DIR (J202-13)

Port giving output of TxD/RxD direction in RS-485 communication

- TxD: High (+3.3V)
- RxD: Low (Ground)

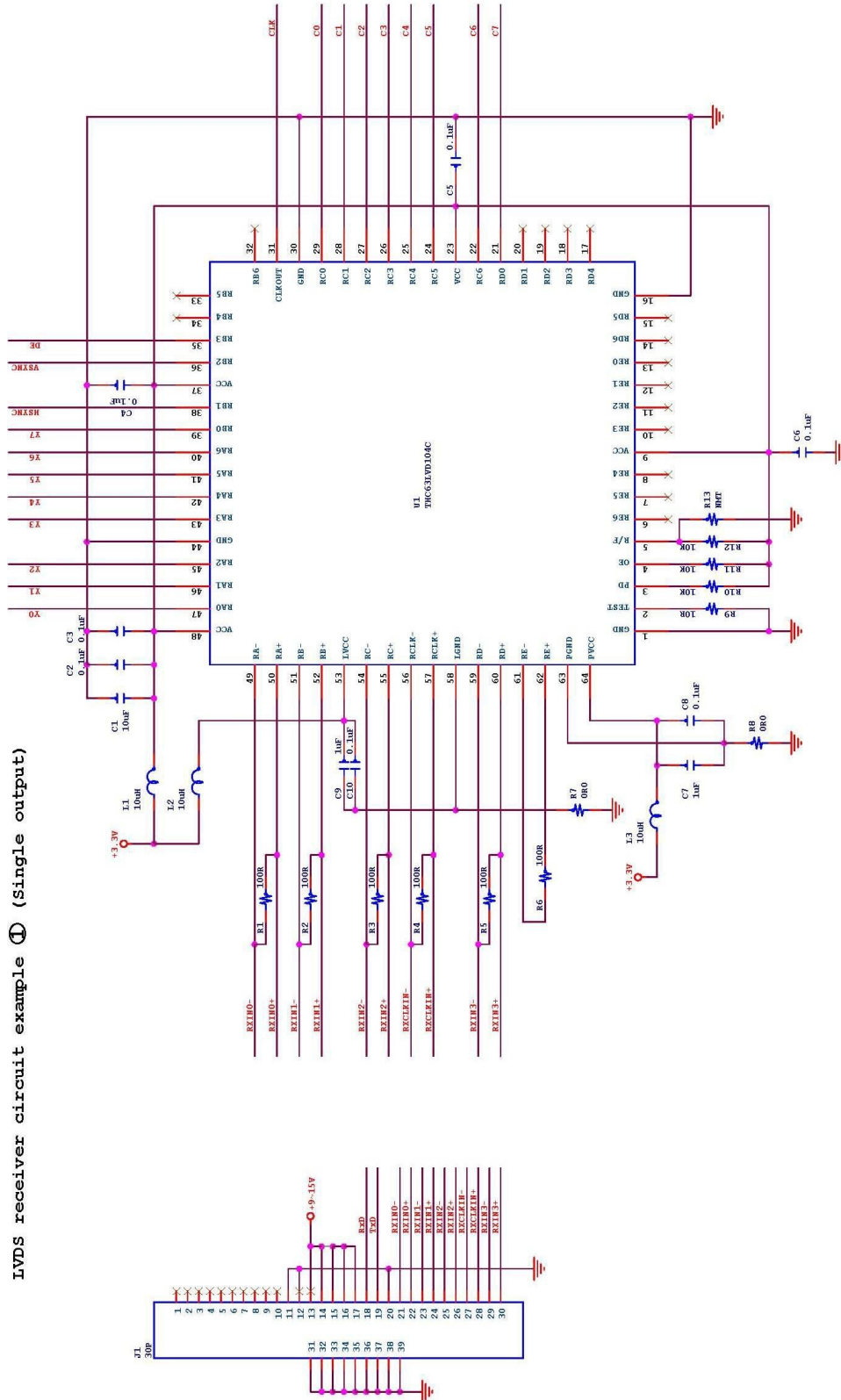
## INTERFACE



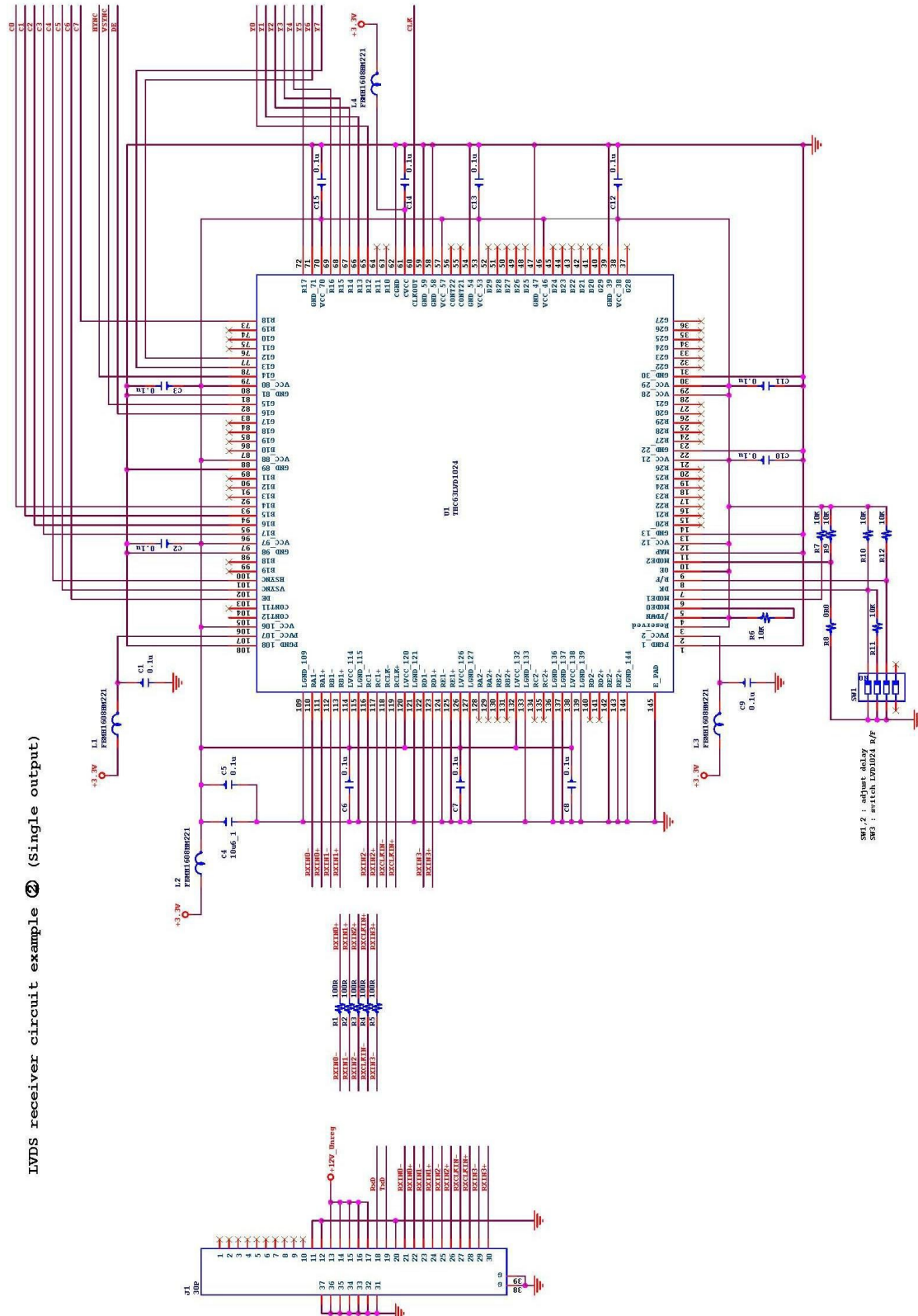
- The AS-CAM-10LGHD-A uses an LVDS transmitter IC chip. The LVDS receiver IC chip (THC63LVD1024, THC63LVD104C, BU90R102) is recommended.
- Recommended connectors and cables:
  - Cable: #42 thin coaxial cable
  - Connector: USL20-30S (KEL)

# LVDS RECEIVER CIRCUITS

## THC63LVD104C circuit example (Single LVDS mode output)

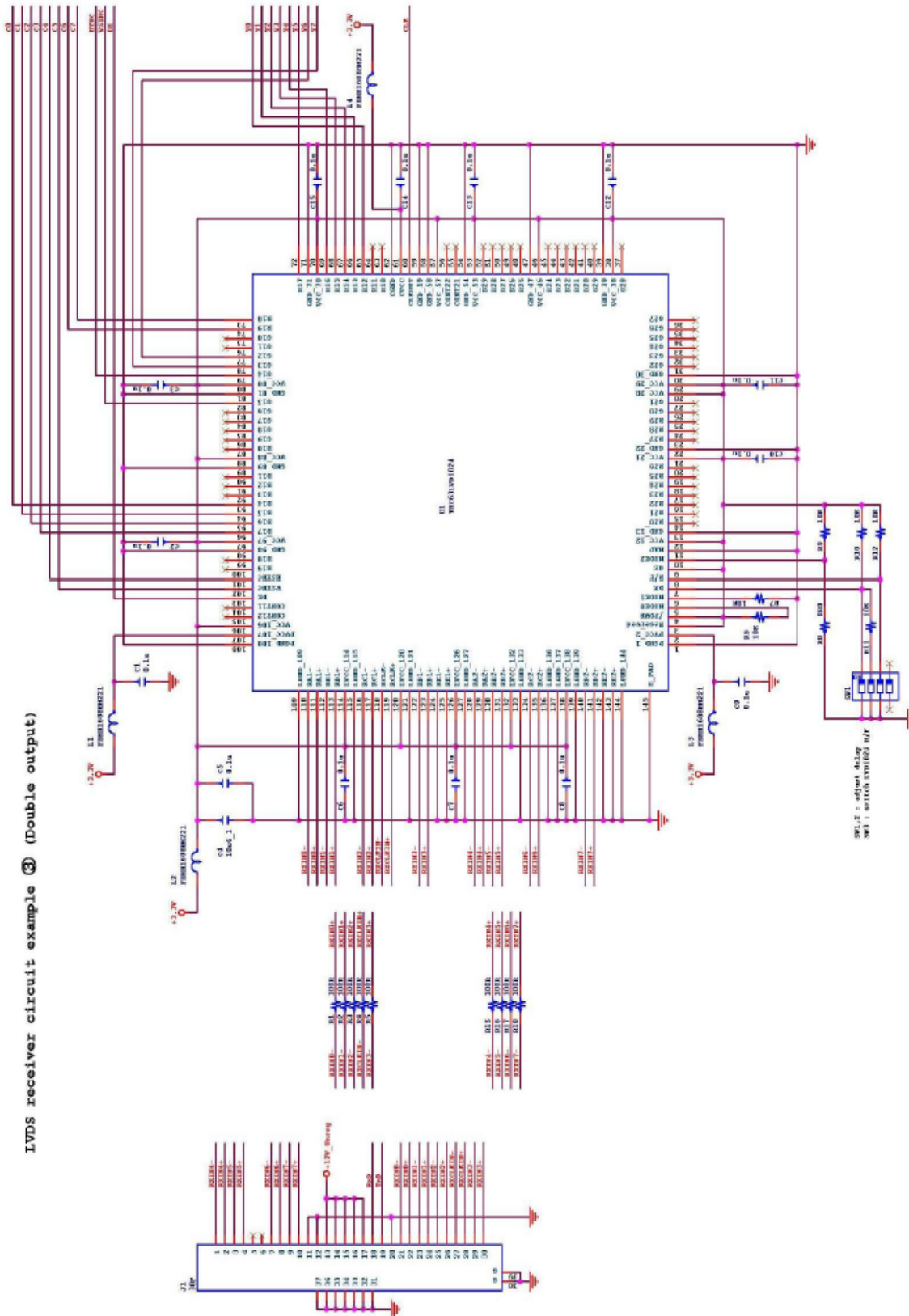


## LVDS receiver circuit example ② (Single output)

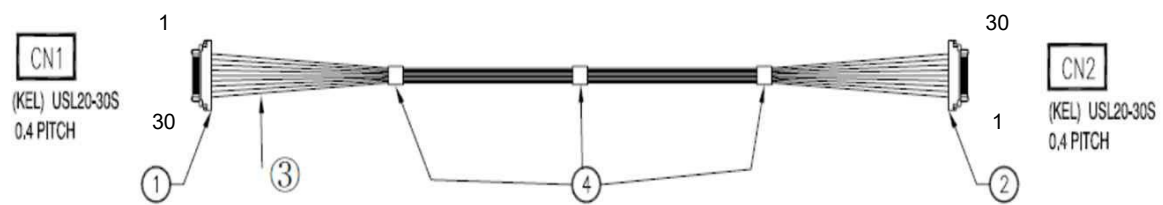


# THC63LVD1024 circuit example (Dual LVDS mode output)

LVDS receiver circuit example ③ (Double output)



## CABLE SPECIFICATIONS



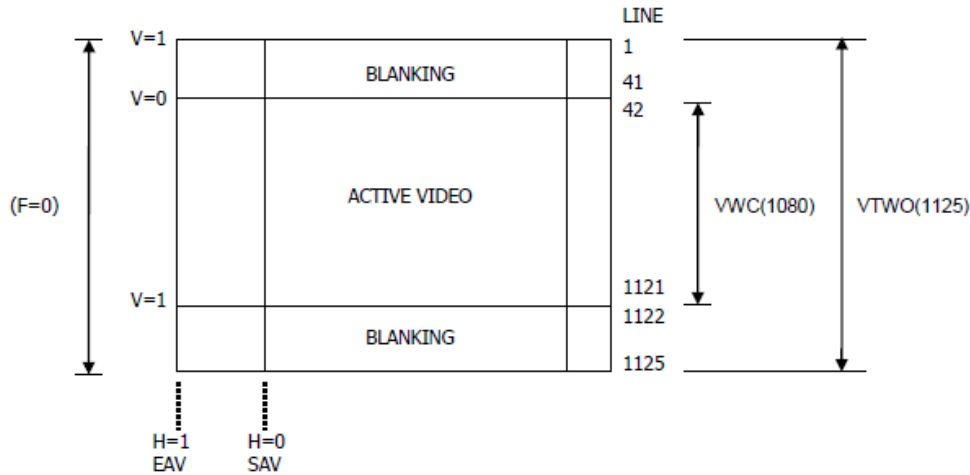
- ①, ②: Connecting to USL20-30S (KEL)
- ③: #42 thin coaxial cable
- ④: Binding tape

## TIMING CHARTS

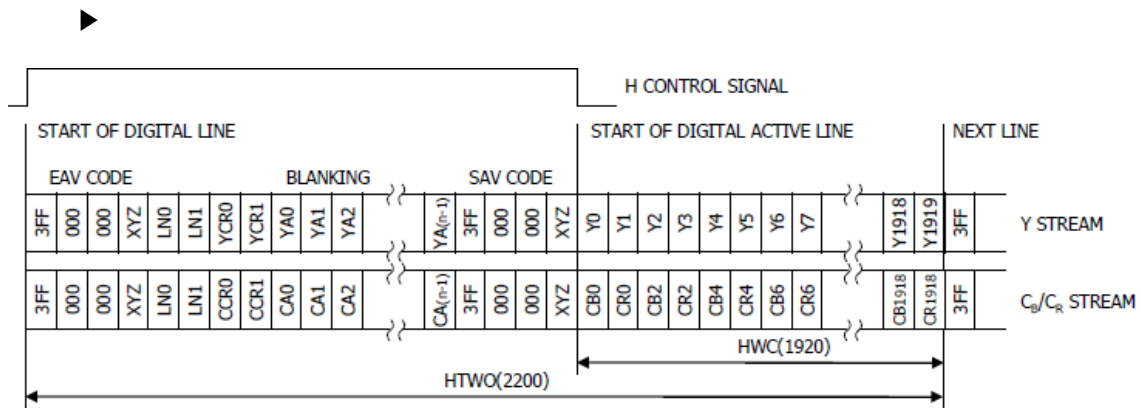
### 1. 1080p Output Timing Chart

ITU-R BT.1120 includes progressive scan formats with 1080 active lines, with Y'C'BC'R 4:2:2 sampling at pixel rates of 74.25MHz (30/25fps) or 148.5MHz (60/50fps). The following diagrams show horizontal and vertical timing for 1080-line progressive systems.

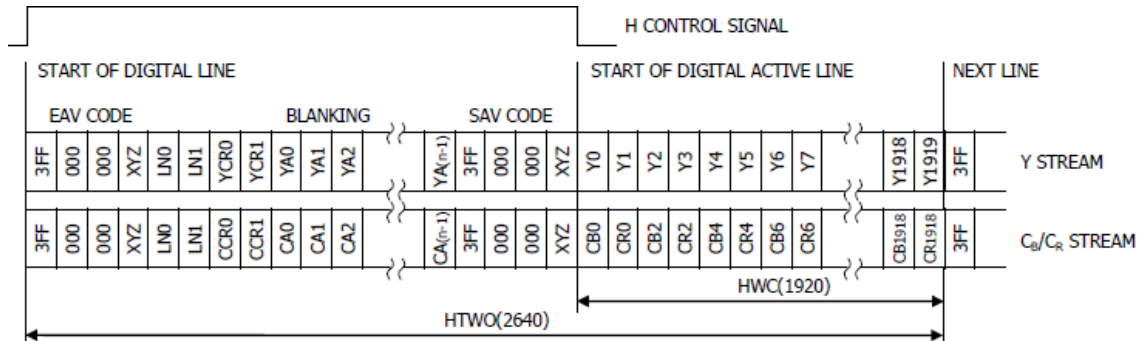
1. Frame timing relationship for 1080-line progressive systems.



2. Data stream over one video line – 1080p 60/30 fps



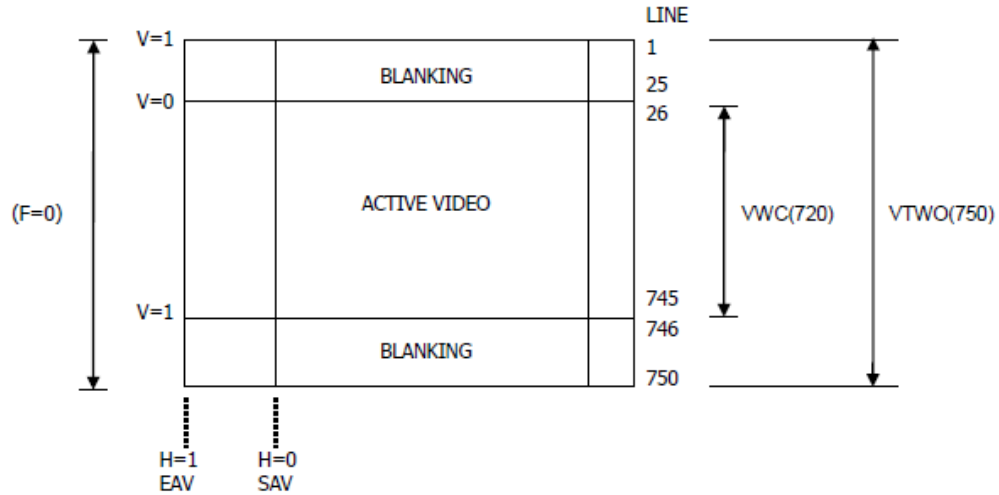
3. Data stream over one video line – 1080p 50/25 fps



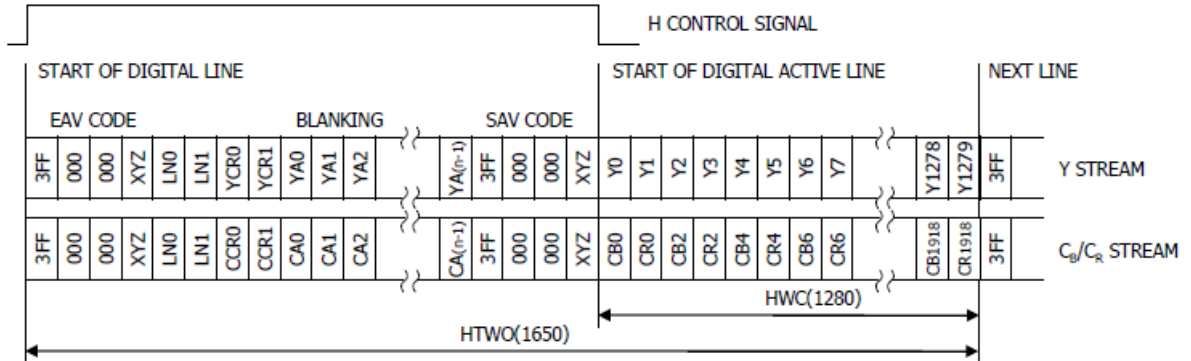
## 2. 720p Output Timing Chart

ITU-R BT.1120 also includes progressive scan formats with 720 active lines, with Y'C'BC'R 4:2:2 sampling at pixel rates of 74.25MHz. The following diagrams show horizontal and vertical timing for 720-line progressive systems.

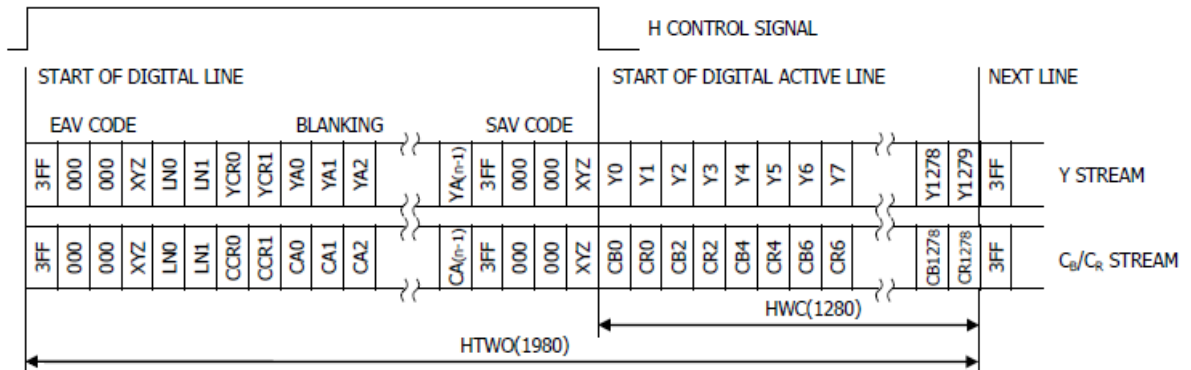
1. Frame timing relationship for 720-line progressive systems.



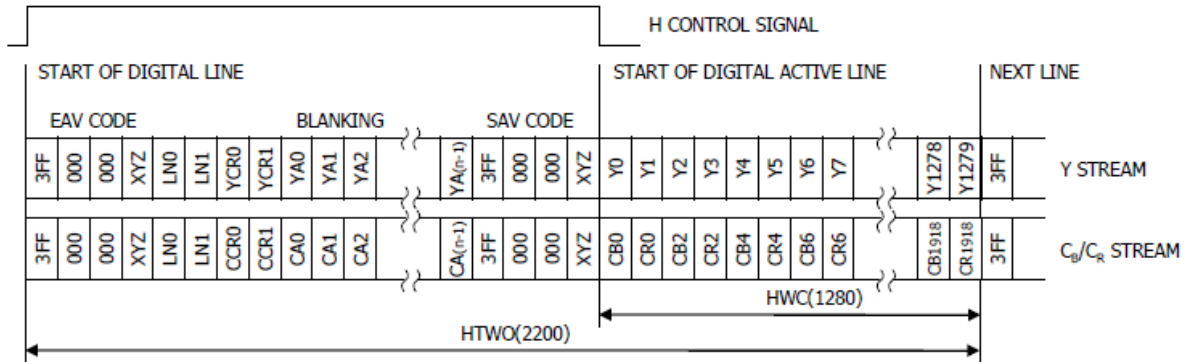
2. Data stream over one video line- 720p 60fps



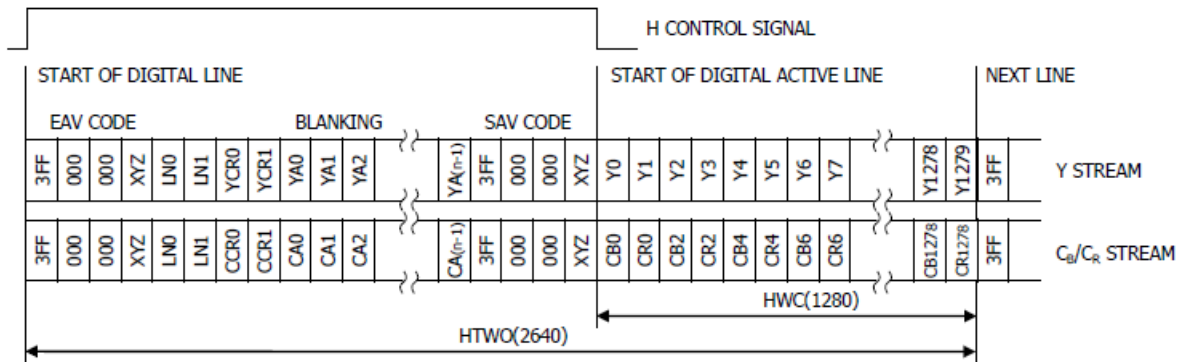
3. Data stream over one video line- 720p 50fps



#### 4. Data stream over one video line- 720p 30fps



#### 5. Data stream over one video line- 720p 25fps



### 3. EAV and SAV Sequence

The EAV and SAV sequences are shown in Table A. The status word is defined as:

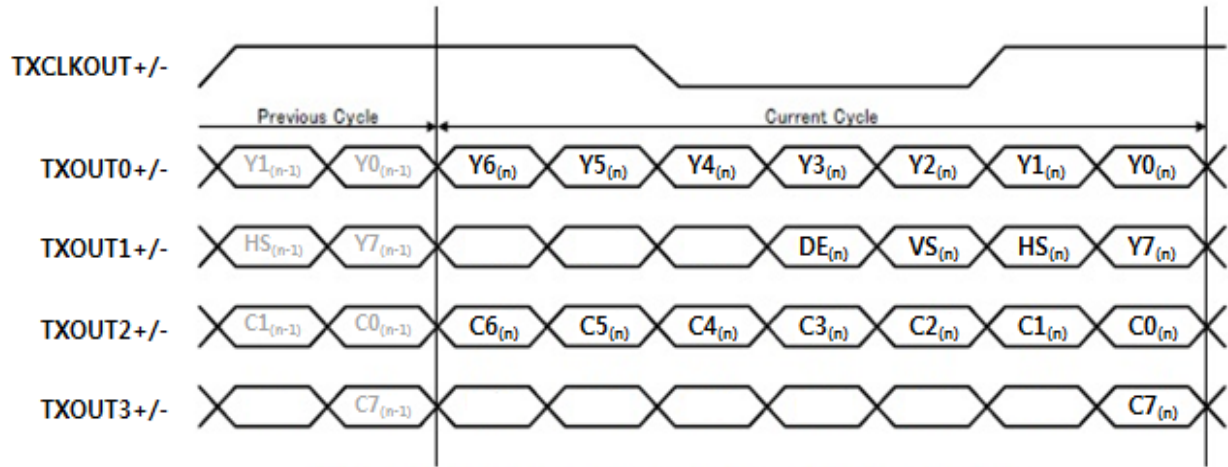
- F = "0" or "1" (Selectable)
- V = "1" during vertical blanking
- H = "0" at SAV, H = "1" at EAV
- P3–P0 = protection bits
- $P3 = V \oplus H$
- $P2 = F \oplus H$
- $P1 = F \oplus V$
- $P0 = F \oplus V \oplus H$

|             | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|-------------|----|----|----|----|----|----|----|----|----|----|
| Preamble    | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
|             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Status word | 1  | F  | V  | H  | P3 | P2 | P1 | P0 | 0  | 0  |

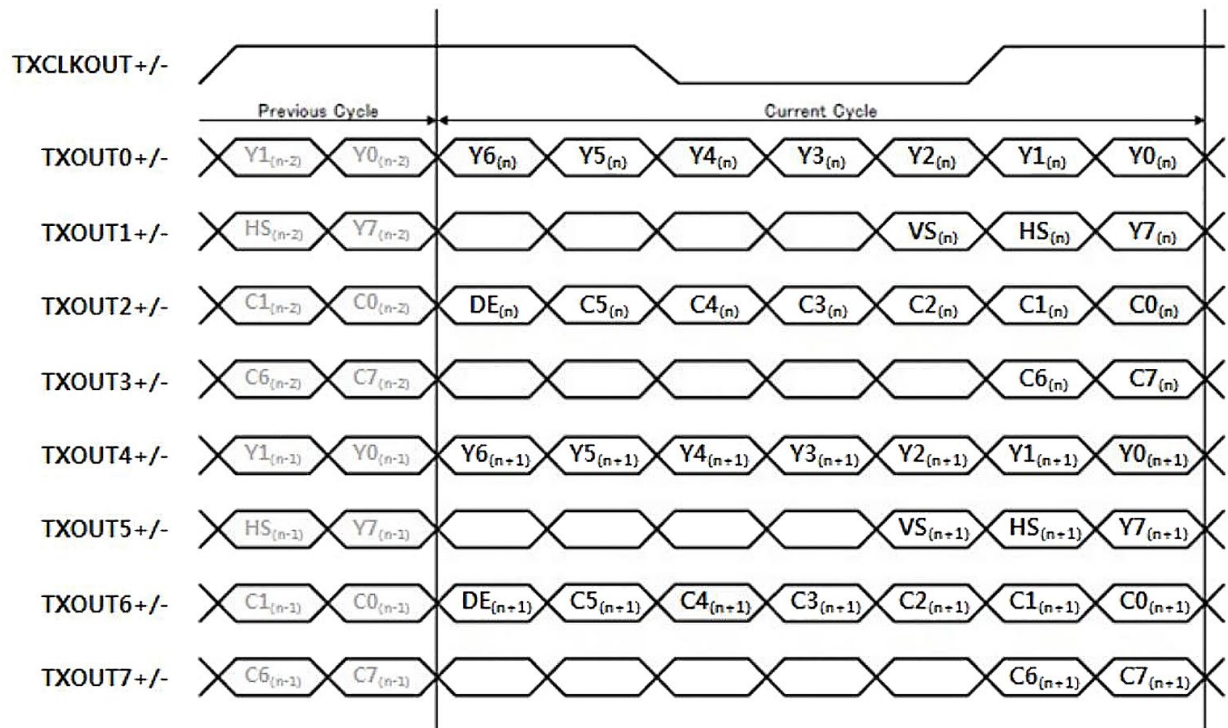
Table A.

## PIXEL DATA FORMAT

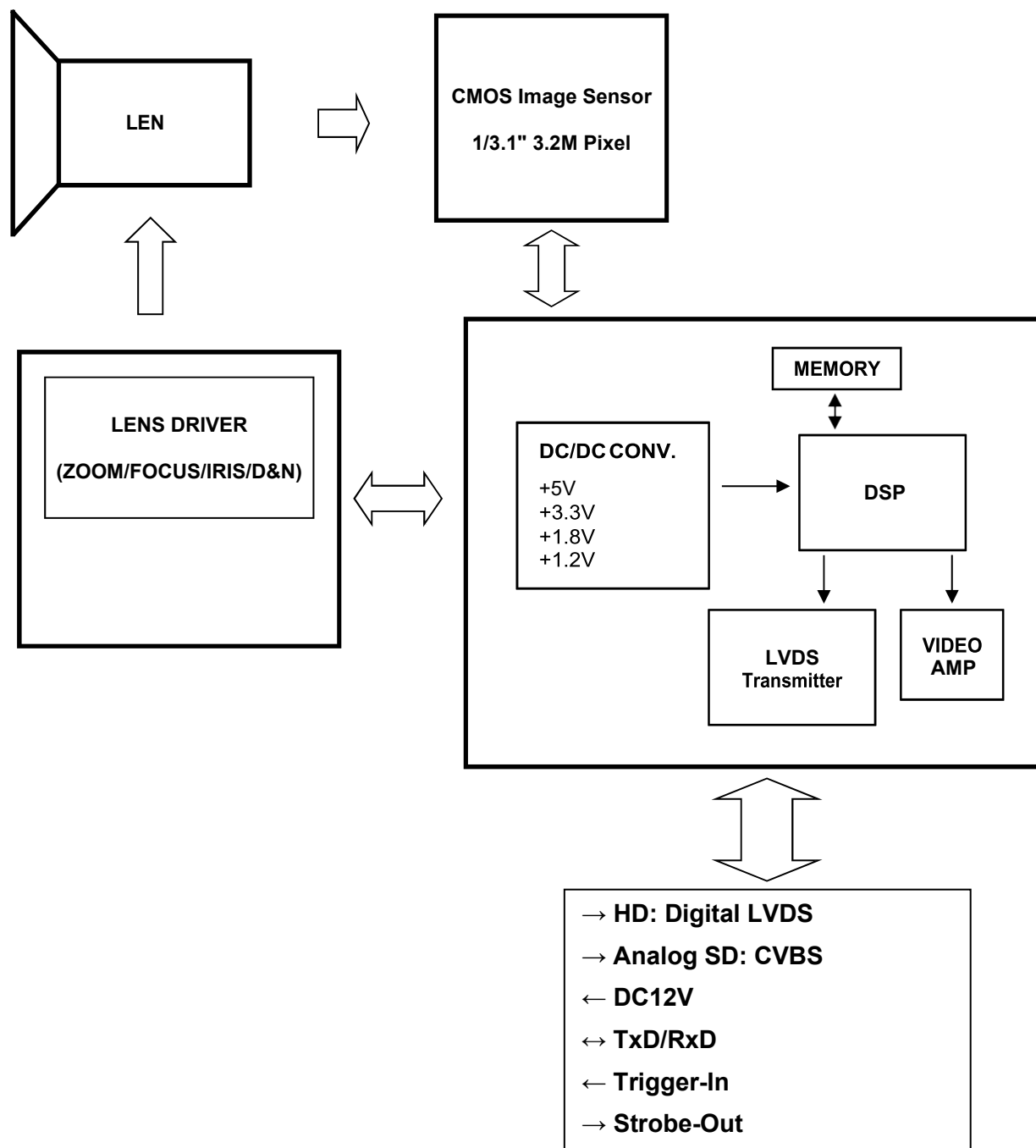
### 1. Output format (Single LVDS mode)



### 2. Output format (Dual LVDS mode)



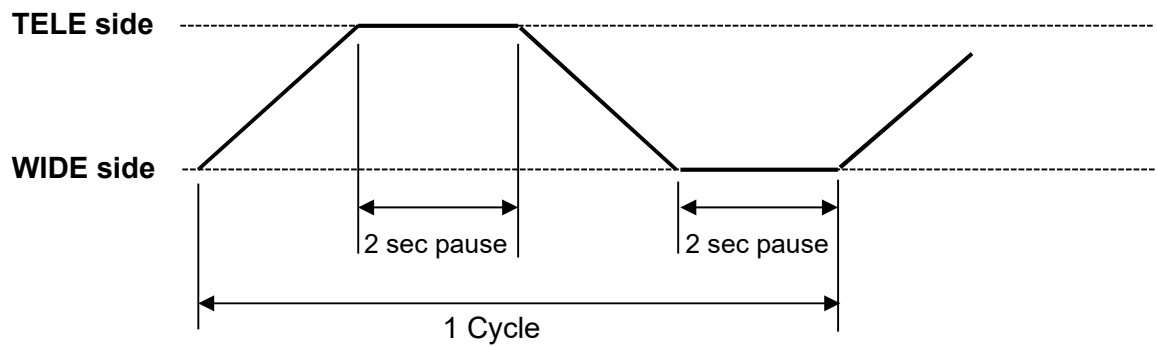
## BLOCK DIAGRAM



## RELIABILITY

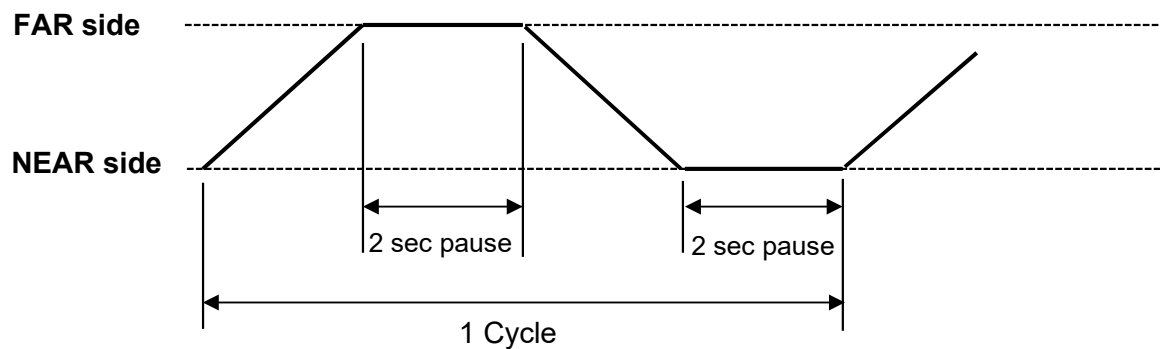
### 1. Zoom

- (1) Zoom operation cycle: 500,000 cycles
- (2) Operation condition: See below
- (3) Test condition: Normal temperature



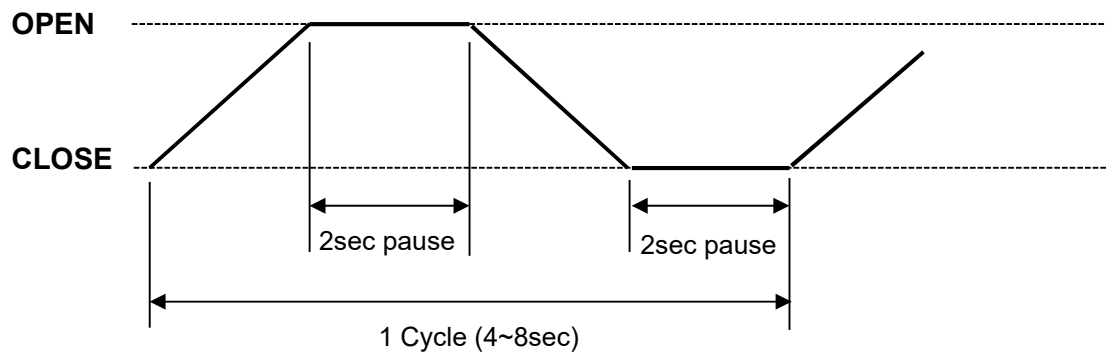
### 2. Focus

- (1) Focus operation cycle: 500,000 cycles
- (2) Operation condition: See below
- (3) Test condition: Normal temperature



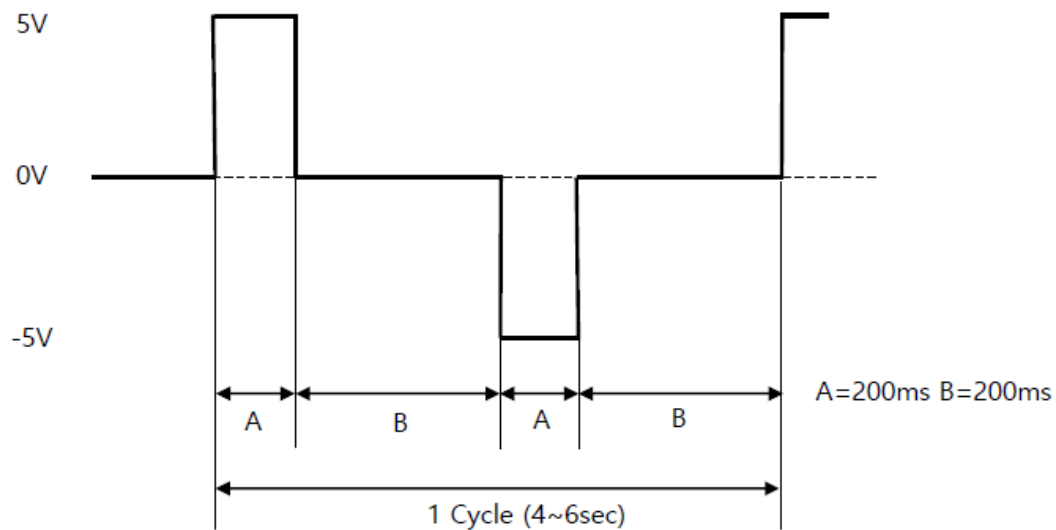
### 3. Auto-Iris

- (1) Auto-iris operation cycle: 300,000 cycles
- (2) Operation condition: See below
- (3) Test condition: Normal temperature



### 4. IR-Cut Filter

- (1) IRCF operation cycle: 50,000 cycles
- (2) Operation condition: See below
- (3) Test condition: Normal temperature



## FUNCTIONS

### 1. Zoom

#### ► Max. zoom ratio

- Optical Zoom: Max x10
- Digital Zoom: Max x32
- Optical + Digital Zoom: Max x320

※ Digital Zoom cannot be used with the DIS function.

#### ► Digital zoom mode

- Combined mode: After the optical zoom has reached its maximum level, the camera switches to digital zoom mode when zooming in. Likewise, the camera switches back to optical zoom mode after the digital zoom has reached its minimum level when zooming out.
- Separate mode: Optical zoom and digital zoom can be operated separately.

### 2. Focus

#### ► Auto focus mode

- Auto Mode: Auto Focus automatically adjusts the focus position to maximize the high frequency content of the picture in a center measurement area, taking into consideration the high luminance and strong contrast components. Auto Mode is the normal mode for AF operation.
- Interval Mode: The mode used for Auto Focus movements carried out at particular intervals. The interval time and active time for AF movements and for the timing of the stops can be set.

Interval mode start



- Zoom trigger mode (One push mode): When the zoom is changed with the TELE or the WIDE buttons, the pre-set value becomes that for AF mode. Then it stops.

#### ► Lens Initialize

Initialize the zoom and focus of the lens. Even when power is already on, it initializes the Zoom and the Focus.

► **Manual focus mode**

Focus position can be adjusted by manual only using Far/Near button or Far/Near command.

- One push trigger: When a Trigger Command is sent, the lens moves to adjust the focus for the subject. The focus lens then holds that position until the next Trigger Command is input.
- Infinity mode: The lens is forcibly moved to a position suitable for an unlimited distance.

► **Near Limit (Focus Distance)**

Can be set in minimum range of focus.

### 3. Trigger

► **Trigger mode**

- Free run mode: Continuous image output mode.
- Ext-trigger mode: External trigger synchronous image output mode.

※ When Ext-trigger mode is selected, focus mode does not work and exposure mode are forced into manual mode

### 4. Auto Exposure

► **Exposure mode**

- Auto mode: Full Auto with Auto Iris and Shutter Speed. User can turn on/off AGC and Digital Slow Shutter feature.
- Iris priority mode: User can set Iris Level, and shutter speed is set automatically according to the brightness of the subject. User can turn on/off AGC and Digital Slow Shutter.
- Shutter priority mode: User can set variable shutter speed, and Iris is set automatically according to the brightness of the subject. User can turn on/off AGC.
- Manual mode: User can set Iris, Shutter speed and Gain. User can also use Digital Slow Shutter by adjusting the shutter speed.
- Bright mode (Manual): User can set Iris and Gain.

※ Refer to the Exposure Control in Command List for the value range of AGC Gain, Shutter Speed, Iris and Exposure compensation.

► **Exposure compensation (Brightness)**

Function to offset the internal reference brightness level used in the AE mode.

► **Back light mode**

- BLC (Back Light Compensation) mode: The BLC function provides compensation by increasing the brightness of the overall screen so that subjects being shot with a loss of dark detail due to backlight will have just the right brightness level.
- HLC (High Light Compensation) mode: When extremely bright light is projected to the camera masking is used on the portion to prevent partial saturation on the monitor

► **Day&Night (ICR) mode**

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

- Auto mode: It automatically switches the settings needed for attaching or removing the IR Cut Filter. With a set level of darkness, the IR Cut Filter is automatically disabled. With a level of brightness, the IR Cut Filter is automatically enabled.
- Ext-In mode: It switches to Day mode when the input from D&N-IN Port is High and switches to Night mode when it is low.

► **Night function settings**

The following features can be set for Night state-only.

- Focus mode
- Exposure mode
- AGC (Gain Limit and Manual Gain)
- Shutter Speed
- Iris
- DSS
- Flickerless
- Brightness
- Back Light mode
- Sharpness

## **5. White Balance**

► **White Balance mode**

- Auto mode: This mode computes the white balance value output using color information from the entire screen. It outputs the proper value using the color temperature (2,300K ~ 8,000K).
- One push mode: This is a fixed white balance mode that may be automatically readjusted only at the request of the user (One-push Trigger)
- Manual mode: Manual control of R and B gain.
- Indoor mode: 3700K base mode.
- Outdoor mode: 5100K base mode.
- Auto-Ext mode: This mode operating on a wider range of color temperatures than Auto mode. (<2,000K (Sodium Light) ~ 10,000K).



## 6. DNR (Digital Noise Reduction)

By using both of 2D DNR (space-based) and 3D DNR (time-based), the amount of low illuminance noise has been significantly reduced and the signal-to-noise ratio(S/N) as well as horizontal resolution has been improved, resulting in a clear and sharp image display even in the dark environment.

※ If the 3D DNR Level is set too high, the camera malfunction of image ghost can be happened in dark environment.

## 7. Mirror

This function reverses the video output from the camera upside down or left/right reverse.

## 8. Sharpness (Aperture)

This function adjusts the enhancement of the edge of objects in the picture.

## 9. Defog

Eliminate amount of fog on display screen. When DEFOG is ON, ACE and WDR function cannot turn on.

## 10. Freeze

Captures an image in the field memory of the camera so that this image can be output continuously.

## 11. Privacy Mask

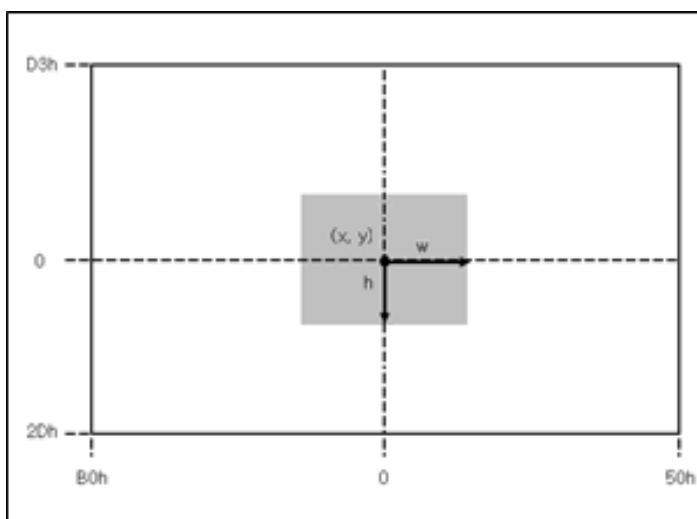
- ▶ Mask can be set on up to 8 places according to Pan/Tilt positions.
- ※ Only 4 masks are displayed on the CVBS and the SDI output.
- ▶ Individual on/off zone masking settings.
- ▶ Two groups from among 14 colors in each group transparency can be individually set for each or 8 privacy zones.
- ▶ Interlocking control with zooming.
- ▶ Interlocking control with Pan/Tilt. (Interlock mode)
- ▶ Parameters in VISCA Command (Privacy related commands in Command List)
  - Mask Number (mm): Mask A = 0 ~ Mask H = 7
- ※ Mask A has highest priority and Mask H has lowest priority
  - Mask setting bit (pp pp pp pp)

|       | pp |   |   |   |   |   |   |   | pp |   |   |   |   |   |   |   | pp |   |   |   |   |   |   |   | pp |   |   |   |   |   |   |   |
|-------|----|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|
| Bit   | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Mask# | -  | - | - | - | - | - | - | - | -  | - | - | - | - | - | - | - | -  | - | - | - | - | - | H | G | -  | - | F | E | D | C | B | A |

- Mask Modify setting (nn):
  - 00h = modifying the mask size for the existing mask size
  - 01h = setting newly the mask size to default value

- Mask Center Position:
  - x (pp) = B0h(-50h) ~ 50h
  - y (qq) = D3h(-2Dh) ~ 2Dh
- ※ Can be set in Non-Interlock mode only.
- Fixed as (0,0) in Interlock mode.

- Mask Size
  - w (rr) = B0h(-50h) ~ 50h
  - h (ss) = D3h(-2Dh) ~ 2Dh



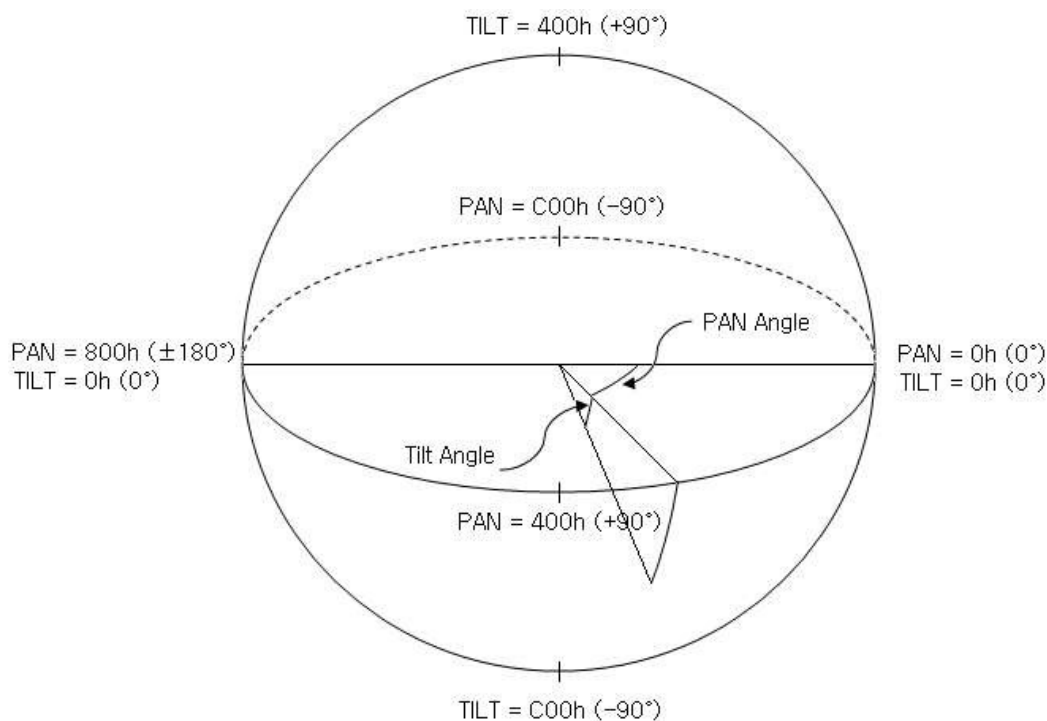
- Mask Color (qq, rr)

| Color   |                                                   | Code(qq, rr)     |              |
|---------|---------------------------------------------------|------------------|--------------|
|         |                                                   | Non-transparency | Transparency |
| Black   |                                                   | 00 h             | 10 h         |
| Gray    | <div>↑ Light</div> <div>↕</div> <div>↓ Dark</div> | 01 h             | 11 h         |
|         |                                                   | 02 h             | 12 h         |
|         |                                                   | 03 h             | 13 h         |
|         |                                                   | 04 h             | 14 h         |
|         |                                                   | 05 h             | 15 h         |
|         |                                                   | 06 h             | 16 h         |
| White   |                                                   | 07 h             | 17 h         |
| Red     |                                                   | 08 h             | 18 h         |
| Green   |                                                   | 09 h             | 19 h         |
| Blue    |                                                   | 0A h             | 1A h         |
| Cyan    |                                                   | 0B h             | 1B h         |
| Yellow  |                                                   | 0C h             | 1C h         |
| Magenta |                                                   | 0D h             | 1D h         |

- Pan/Tilt angle (ppp, qqg):

Range of angle (PAN: -180° ~ 180°, TILT: -90° ~ 90°)

Angle resolution ( 360 / 4096)





## 12. Motion Detection

Instructs the camera to detect movement within the monitoring area and the send an alarm signal automatically.

- ▶ You can set up to 4 MD Window.
- ▶ When the motion is detected in the set frame, the Alarm activates through Alarm ACK and MD-Out port.
- ▶ The interval of alarm detection and dwell time can be set up to 255 seconds in units of one second.
  - Interval Time: The MD Alarm isn't activated again till the interval time passed by.
  - Dwell Time: keeps the MD Alarm Signal (MD-Out) and MD Zoom Preset Position during the set dwell time, after the alarm activated.

## 13. DIS (Digital Image Stabilizer)

The DIS function internally detects shaking of the image due to camera shaking, and performs digital compensation processing to suppress this shaking and stabilize the image output.

※ When the DIS is turned on, the digital zoom is forced off.

## 14. Comp Scan

A pixel blemish-masking feature, which can be made to reevaluate overall CMOS pixel blemishes and mask severely flawed pixels automatically upon receiving the COMP SCAN command. This feature helps to make the flaws found in CMOS images, even after the camera has been powered on for some time.

## 15. Custom Preset

As with the position preset function, the camera shooting conditions can be stored and recalled. The settings are recalled when the power is turned on.

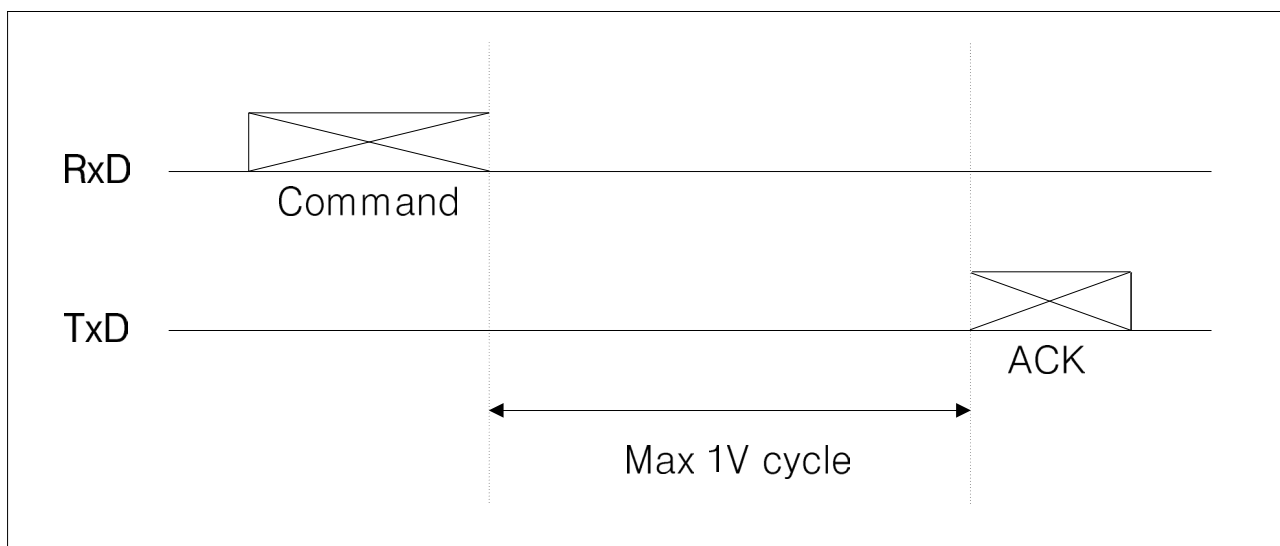
## PROTOCOL

### 1. Timing

As Command processing can only be carried out one time in a Vertical cycle, it takes the maximum 1V cycle time for an ACK/Completion to be returned. If the Command ACK/Completion communication time can be cut shorter than the 1V cycle time, then every 1V cycle can receive a Command.

※ 1V cycle

- 30fps mode: 33.3ms
- 60fps mode: 16.7ms
- 25fps mode: 40.0ms
- 50fps mode: 20.0ms



### 2. Communication parameter

- ▶ Protocol: VISCA, Pelco-D, Pelco-P
- ▶ ID: 1~7 (VISCA), 1~255 (Pelco-D), 1~254 (Pelco-P)
- ▶ Baud rate: 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
- ▶ Data bit: 8
- ▶ Start bit: 1
- ▶ Stop bit: 1
- ▶ Non parity bit

### 3. Pelco-D Protocol Command List

| Function          | Message Format (Hex) |        |        |          |            |                           |        |
|-------------------|----------------------|--------|--------|----------|------------|---------------------------|--------|
|                   | Byte 1               | Byte 2 | Byte 3 | Byte 4   | Byte 5     | Byte 6                    | Byte 7 |
| Zoom Tele         | FF                   | ID     | 00     | 20       | 00         | 00                        | CS     |
| Zoom Wide         | FF                   | ID     | 00     | 40       | 00         | 00                        | CS     |
| Focus Near        | FF                   | ID     | 01     | 00       | 00         | 00                        | CS     |
| Focus Far         | FF                   | ID     | 00     | 80       | 00         | 00                        | CS     |
| Stop              | FF                   | ID     | 00     | 00       | Don't care |                           | CS     |
| Menu (Set)        | FF                   | ID     | 00     | 03 or 07 | 00         | 5F                        | CS     |
| Esc               | FF                   | ID     | 00     | 03 or 07 | 00         | 60                        | CS     |
| Up                | FF                   | ID     | 00     | 08       | 00         | XX                        | CS     |
| Down              | FF                   | ID     | 00     | 10       | 00         | XX                        | CS     |
| Left              | FF                   | ID     | 00     | 04       | XX         | 00                        | CS     |
| Right             | FF                   | ID     | 00     | 02       | XX         | 00                        | CS     |
| Set Zoom Preset   | FF                   | ID     | 00     | 03       | 00         | Preset ID<br>(01 ~ 05)    | CS     |
| Clear Zoom Preset | FF                   | ID     | 00     | 05       | 00         | Preset ID<br>(01 ~ 05)    | CS     |
| Go to Zoom Preset | FF                   | ID     | 00     | 07       | 00         | Preset ID<br>(01 ~ 05)    | CS     |
| Focus Mode        | FF                   | ID     | 00     | 2B       | 00         | 00,01: Auto<br>02: Manual | CS     |

- ▶ ID: Camera ID (1 ~ 255)
- ▶ XX: Speed (10h < XX ≤ 40h)
- ▶ CS (Check Sum): An 8-bit sum of byte 2 ~ 6 in the message.



#### 4. Pelco-P Protocol Command List

| Function          | Message Format (Hex) |        |        |          |            |                        |        |        |
|-------------------|----------------------|--------|--------|----------|------------|------------------------|--------|--------|
|                   | Byte 1               | Byte 2 | Byte 3 | Byte 4   | Byte 5     | Byte 6                 | Byte 7 | Byte 8 |
| Zoom Tele         | A0                   | ID     | 00     | 20       | 00         | 00                     | AF     | CS     |
| Zoom Wide         | A0                   | ID     | 00     | 40       | 00         | 00                     | AF     | CS     |
| Focus Near        | A0                   | ID     | 02     | 00       | 00         | 00                     | AF     | CS     |
| Focus Far         | A0                   | ID     | 01     | 00       | 00         | 00                     | AF     | CS     |
| Stop              | A0                   | ID     | 00     | 00       | Don't care |                        | AF     | CS     |
| Menu (Set)        | A0                   | ID     | 00     | 03 or 07 | 00         | 5F                     | AF     | CS     |
| Esc               | A0                   | ID     | 00     | 03 or 07 | 00         | 60                     | AF     | CS     |
| Up                | A0                   | ID     | 00     | 08       | 00         | XX                     | AF     | CS     |
| Down              | A0                   | ID     | 00     | 10       | 00         | XX                     | AF     | CS     |
| Left              | A0                   | ID     | 00     | 04       | XX         | 00                     | AF     | CS     |
| Right             | A0                   | ID     | 00     | 02       | XX         | 00                     | AF     | CS     |
| Set Zoom Preset   | A0                   | ID     | 00     | 03       | 00         | Preset ID<br>(01 ~ 05) | AF     | CS     |
| Clear Zoom Preset | A0                   | ID     | 00     | 05       | 00         | Preset ID<br>(01 ~ 05) | AF     | CS     |
| Go to Zoom Preset | A0                   | ID     | 00     | 07       | 00         | Preset ID<br>(01 ~ 05) | AF     | CS     |

- ▶ ID: Camera ID (0 ~ 254, Zero indexed)
- ▶ XX: Speed (10h < XX ≤ 40h)
- ▶ CS (Check Sum): An XOR sum of byte 1 ~ 7 in the message.

## 5. Visca Protocol

### ► Command packet (Variable packet length)

| Byte 0 | Byte 1  | Byte 2 | ... | Byte n-2 | Byte n-1   |
|--------|---------|--------|-----|----------|------------|
| Header | Message |        |     |          | Terminator |
| 8Xh    | QQ      | ...    | ... | ...      | FFh        |

| Bit7             | Bit6 | Bit5 | Bit4 | Bit3               | Bit2 | Bit1 | Bit0 |
|------------------|------|------|------|--------------------|------|------|------|
| 1                | 0    | 0    | 0    | 0                  | x    | x    | x    |
| Sender's address |      |      |      | Receiver's address |      |      |      |

- X: 1 ~ 7 (Camera address)
- QQ: 01 (Command), 09 (Inquiry)

### ► Ack message packet (Variable packet length)

| Byte 0 | Byte 1  | Byte 2 | ... | Byte n-2 | Byte n-1   |
|--------|---------|--------|-----|----------|------------|
| Header | Message |        |     |          | Terminator |
| Y0h    | QR      | ...    | ... | ...      | FFh        |

| Bit7             | Bit6 | Bit5 | Bit4 | Bit3               | Bit2 | Bit1 | Bit0 |
|------------------|------|------|------|--------------------|------|------|------|
| 1                | y    | y    | y    | 0                  | 0    | 0    | 0    |
| Sender's address |      |      |      | Receiver's address |      |      |      |

- Y: 9 ~ F (Camera address + 8)
- Q: 4 (Receive Ack), 5 (Completion message), 6 (Error message)
- R: Socket Number (1 ~ 3)

※ When command messages are sent to the camera, it is normal to send the next command message after waiting for the completion message or error message to return. However, to deal with advanced uses, the camera has three buffers (memories) for commands, so that up to three commands including the commands currently being executed can be received. When the camera receives commands, it notifies the sender which command buffer was used using the socket number of the ACK message.

| Ack type              | Reply packet | SS | Description                 |
|-----------------------|--------------|----|-----------------------------|
| Recevie Ack           | Y0 4R FF     | 01 | Message length error        |
| Completen (Commands)  | Y0 5R FF     | 02 | Syntax error                |
| Completen (Inquiries) | Y0 50 ... FF | 03 | Command buffer full         |
| Error                 | Y0 6R SS FF  | 04 | Command cancelled           |
|                       |              | 05 | No socket (to be cancelled) |
|                       |              | 41 | Command not executable      |

- Camera ID: 1
- Socket number: 1

```

sequenceDiagram
    participant Host
    participant Camera
    Host->>Camera: 81 01 04 38 02 FF
    Note over Camera: Receive
    Camera->>Host: 90 41 FF
    Note over Camera: Decoding
    Note over Camera: Execution of received command
    Camera->>Host: 90 51 FF
    Note over Camera: Execution is completed
  
```

```

sequenceDiagram
    participant Host
    participant Camera
    Host->>Camera: 81 09 04 38 FF (Send)
    Camera-->>Host: 90 50 02 FF (Decoding)

```

Sent from the peripheral device to the controller when a device is removed from or added to the network. The address must be re-set when this message is received:

- Y: 9 ~ F (Camera address + 8)



## VISCA 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                                                                                              |
|                |                      | 8x 01 00 01 FF             |                                                                                                        |
| CommandCancel  |                      | 8x 2p FF                   | p : Socket No.(1 ~ 3)                                                                                  |
| CAM_Power      | Power Reset          | 8x 01 04 00 03 FF          | Camera Rebooting                                                                                       |
| CAM_Zoom       | Stop                 | 8x 01 04 07 00 FF          | p : 0 (Slow) ~ 7 (Fast)<br>pqrs : Zoom Position                                                        |
|                | Tele (Standard)      | 8x 01 04 07 02 FF          |                                                                                                        |
|                | Wide (Standard)      | 8x 01 04 07 03 FF          |                                                                                                        |
|                | Tele (Variable)      | 8x 01 04 07 2p FF          |                                                                                                        |
|                | Wide (Variable)      | 8x 01 04 07 3p FF          |                                                                                                        |
|                | Direct               | 8x 01 04 47 0p 0q 0r 0s FF |                                                                                                        |
| CAM_ZoomPreset | Set                  | 8x 01 04 67 01 0p FF       | p : Zoom Preset Number (0 ~ 4)                                                                         |
|                | Run                  | 8x 01 04 67 02 0p FF       | p : Zoom Preset Number (0 ~ 4)                                                                         |
|                | Clear                | 8x 01 04 67 03 0p FF       | p : Zoom Preset Number (0 ~ 4, Fh : All)                                                               |
| CAM_DZoom      | On                   | 8x 01 04 06 02 FF          | Digital Zoom ON/OFF                                                                                    |
|                | Off                  | 8x 01 04 06 03 FF          |                                                                                                        |
|                | Combine Mode         | 8x 01 04 36 00 FF          | Optical/Digital Zoom Combined                                                                          |
|                | Separate Mode        | 8x 01 04 36 01 FF          | Optical/Digital Zoom Separated                                                                         |
|                | Stop                 | 8x 01 04 06 00 FF          |                                                                                                        |
|                | Tele (Variable)      | 8x 01 04 06 2p FF          | p : 0(Slow) ~ 7(Fast)                                                                                  |
|                | Wide (Variable)      | 8x 01 04 06 3p FF          | * Effective separate mode                                                                              |
|                | x1/Max               | 8x 01 04 06 10 FF          | x1/Max Magnification switchover<br>* Effective separate mode                                           |
|                | Direct               | 8x 01 04 46 00 00 0p 0q FF | pq : D-Zoom Position * Effective separate mode                                                         |
| CAM_Focus      | Stop                 | 8x 01 04 08 00 FF          |                                                                                                        |
|                | Far (Standard)       | 8x 01 04 08 02 FF          |                                                                                                        |
|                | Near (Standard)      | 8x 01 04 08 03 FF          |                                                                                                        |
|                | Far (Variable)       | 8x 01 04 08 2p FF          | p : 0(Slow) ~ 7(Fast)                                                                                  |
|                | Near (Variable)      | 8x 01 04 08 3p FF          |                                                                                                        |
|                | Direct               | 8x 01 04 48 0p 0q 0r 0s FF | pqrs : Focus Position                                                                                  |
|                | 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          |                                                                                                        |
|                | Focus mode (D&N)     | 8x 01 04 38 0p 0q FF       | p : Focus mode in day state<br>q : Focus mode in night state<br>(2 : Auto focus, 3 : Manual focus)     |
|                | One Push Trigger     | 8x 01 04 18 01 FF          | One Push AF Trigger                                                                                    |
|                | Infinity             | 8x 01 04 18 02 FF          | Forced Infinity                                                                                        |
|                | Near Limit           | 8x 01 04 28 0p 0q 0r 0s FF | pqrs : Focus Near Limit Position                                                                       |
| CAM_AF Mode    | Normal AF            | 8x 01 04 57 00 FF          | Normal AF Mode                                                                                         |
|                | Interval AF          | 8x 01 04 57 01 FF          | Interval AF Mode                                                                                       |
|                | Zoom Trigger AF      | 8x 01 04 57 02 FF          | Zoom Trigger Mode                                                                                      |
|                | AF mode of (D&N)     | 8x 01 04 57 0p 0q FF       | p : AF mode in day state<br>q : AF mode in night state<br>(0 : Normal, 1 : Interval, 2 : Zoom trigger) |
|                | Active/Interval Time | 8x 01 04 27 0p 0q 0r 0s FF | pq : Active Time(1~255), rs : Interval Time(1~255)                                                     |



| Command Set     | Command           | Command Packet                            | Comments                                                                                                                                                                |
|-----------------|-------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_ZoomFocus   | Direct            | 8x 01 04 47 0p 0q 0r 0s 0t 0u<br>0v 0w FF | pqrs : Zoom Position tuvw : Focus Position                                                                                                                              |
| CAM_Initialize  | Lens              | 8x 01 04 19 01 FF                         | Lens Soft Reset                                                                                                                                                         |
|                 | Comp Scan         | 8x 01 04 19 02 FF                         | Execute White spot compensation                                                                                                                                         |
| 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 AWB      | 8x 01 04 35 03 FF                         | One Push AWB Mode                                                                                                                                                       |
|                 | Manual            | 8x 01 04 35 05 FF                         | Manual Control Mode                                                                                                                                                     |
|                 | Auto-Ext          | 8x 01 04 35 07 FF                         | Auto extended Mode                                                                                                                                                      |
|                 | One Push Trigger  | 8x 01 04 10 05 FF                         | One Push AWB trigger                                                                                                                                                    |
| CAM_RGain       | Reset             | 8x 01 04 03 00 FF                         | Red Gain Manual setting                                                                                                                                                 |
|                 | Up                | 8x 01 04 03 02 FF                         |                                                                                                                                                                         |
|                 | Down              | 8x 01 04 03 03 FF                         |                                                                                                                                                                         |
|                 | Direct            | 8x 01 04 43 00 00 0p 0q FF                | pq : R Gain(0~64h)                                                                                                                                                      |
| CAM_BGain       | Reset             | 8x 01 04 04 00 FF                         | Blue Gain Manual setting                                                                                                                                                |
|                 | Up                | 8x 01 04 04 02 FF                         |                                                                                                                                                                         |
|                 | Down              | 8x 01 04 04 03 FF                         |                                                                                                                                                                         |
|                 | Direct            | 8x 01 04 44 00 00 0p 0q FF                | pq : B Gain(0~64h)                                                                                                                                                      |
| CAM_Chroma      | Direct            | 8x 01 04 13 00 00 0p 0q FF                | pq : Chroma level (0~14h)                                                                                                                                               |
| CAM_ColorHue    | Direct            | 8x 01 04 4F 00 00 00 0p FF                | p:Color hue setting (0 : -18° ~ 14h : +18°)                                                                                                                             |
| CAM_AE          | Full Auto         | 8x 01 04 39 00 FF                         | Auto exposure mode                                                                                                                                                      |
|                 | Manual            | 8x 01 04 39 03 FF                         | Manual control mode                                                                                                                                                     |
|                 | Shutter Priority  | 8x 01 04 39 0A FF                         | Shutter priority auto exposure mode                                                                                                                                     |
|                 | Iris Priority     | 8x 01 04 39 0B FF                         | Iris priority auto exposure mode                                                                                                                                        |
|                 | Bright            | 8x 01 04 39 0D FF                         | Bright Mode (Manual control)                                                                                                                                            |
|                 | AE mode (D&N)     | 8x 01 04 39 0p 0q FF                      | p : AE mode in day state<br>q : AE mode in night state<br>(0 : Auto exposure, 3 : Manual control, Ah : Shutter priority, Bh : Iris priority, Dh : Bright Mode)          |
| CAM_SlowShutter | Auto (On)         | 8x 01 04 5A 02 FF                         | Auto Slow Shutter ON/OFF                                                                                                                                                |
|                 | Manual (Off)      | 8x 01 04 5A 03 FF                         |                                                                                                                                                                         |
|                 | SlowShutter (D&N) | 8x 01 04 5A 0p 0q FF                      | p : Slow Shutter mode in day state<br>q : Slow Shutter mode in night state (2 : Auto, 3 : Manual)                                                                       |
| CAM_MaxDSSLev   | Direct            | 8x 01 04 5A 1p FF                         | p :Max Slow shutter level (0:x2, 1:x4, 2:x8)<br>※ You can't select "x8" in 30 or 25 fps mode                                                                            |
|                 | Direct (D&N)      | 8x 01 04 5A 1p 0q FF                      | p : Max slow shutter level in day state<br>q : Max slow shutter level night state (0:x2, 1:x4, 2:x8, 3:x16, 4:x32, 5:x64)<br>※ You cant select "x64 in 30 or 25fps mode |
| CAM_Shutter     | Reset             | 8x 01 04 0A 00 FF                         | Shutter setting                                                                                                                                                         |
|                 | Up                | 8x 01 04 0A 02 FF                         |                                                                                                                                                                         |
|                 | Down              | 8x 01 04 0A 03 FF                         |                                                                                                                                                                         |
|                 | Direct            | 8x 01 04 4A 00 00 0p 0q FF                | pq : Shutter Position                                                                                                                                                   |
|                 | Direct (D&N)      | 8x 01 04 4A 1p 0q 0r 0s FF                | pq : Shutter position of night state<br>rs : Shutter position of day state                                                                                              |



| Command         | Command Setting   | Command Packet             | Comments                                                                                                |
|-----------------|-------------------|----------------------------|---------------------------------------------------------------------------------------------------------|
| CAM_Iris        | Reset             | 8x 01 04 0B 00 FF          | Iris setting                                                                                            |
|                 | 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                                                                                      |
|                 | Direct (D&N)      | 8x 01 04 4B 1p 0q 0r 0s FF | pq : Iris position of night state<br>rs : Iris position of day state                                    |
| CAM_Gain        | Reset             | 8x 01 04 0C 00 FF          | Gain setting                                                                                            |
|                 | 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                                                                                      |
|                 | Direct (D&N)      | 8x 01 04 4C 1p 0q 0r 0s FF | pq : Gain position of night state<br>rs : Gain position of day state                                    |
|                 | Gain Limit        | 8x 01 04 2C 0p FF          | p : Gain position                                                                                       |
|                 | Gain Limit (D&N)  | 8x 01 04 2C 0p 0q FF       | p : Gain limit position of day state<br>q : Gain limit position of night state                          |
| 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                                                                                     |
|                 | Direct (D&N)      | 8x 01 04 4D 1p 0q 0r 0s FF | pq : Bright position of night state<br>rs : Bright position of day state                                |
| CAM_ExpComp     | On                | 8x 01 04 3E 02 FF          | Exposure Compensation ON/OFF                                                                            |
|                 | Off               | 8x 01 04 3E 03 FF          |                                                                                                         |
|                 | ExpComp (D&N)     | 8x 01 04 3E 0p 0q FF       | p : Exposure compensation in day state<br>q : Exposure compensation in night state<br>(2 : On, 3 : Off) |
|                 | Reset             | 8x 01 04 0E 00 FF          | Exposure Compensation amount setting                                                                    |
|                 | 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 (0 ~ Eh)                                                                           |
|                 | Direct (D&N)      | 8x 01 04 4E 1p 0q 0r 0s FF | pq : ExpComp level of night state<br>rs : ExpComp level of day state (0 ~ Eh)                           |
| CAM_Flickerless | On                | 8x 01 04 7A 02 FF          | Flickerless ON                                                                                          |
|                 | Off               | 8x 01 04 7A 03 FF          | Flickerless OFF                                                                                         |
|                 | Auto              | 8x 01 04 7A 04 FF          | Flickerless auto mode                                                                                   |
|                 | Flickerless (D&N) | 8x 01 04 7A 0p 0q FF       | p : Flickerless mode in day state<br>q : Flickerless mode in night state<br>(2 : On, 3 : Off, 4 : Auto) |
| CAM_BLC         | On                | 8x 01 04 33 02 FF          | Back Light Compensation                                                                                 |
|                 | Off               | 8x 01 04 33 03 FF          |                                                                                                         |
|                 | BLC of (D&N)      | 8x 01 04 33 0p 0q FF       | p : BLC mode in day state<br>q : BLC mode in night state (2 : On, 3 : Off)                              |
| CAM_BLCFunc     | Area OSD Display  | 8x 01 04 3C 0p FF          | p: 0(Area OSD Off), 1(Area OSD On)                                                                      |
|                 | Area Start X      | 8x 01 04 3C 10 00 0p 0q FF | pq: Start Horizontal Position (0 ~ 26h)                                                                 |
|                 | Area Start Y      | 8x 01 04 3C 20 00 0p 0q FF | pq: Start Vertical Position (0 ~ 1Ah)                                                                   |
|                 | Area End X        | 8x 01 04 3C 30 00 0p 0q FF | pq: End Horizontal Position (9~2Fh)                                                                     |
|                 | Area End Y        | 8x 01 04 3C 40 00 0p 0q FF | pq: End Vertical Position (7~21h)                                                                       |
|                 | BLC Level         | 8x 01 04 3C 50 00 0p 0q FF | pq : BLC area weight (0 ~ 6)                                                                            |



| Command         | Command Setting              | Command Packet             | Comments                                                                                                        |
|-----------------|------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------|
| CAM_HLC         | Mode                         | 8x 01 04 32 0p FF          | p: HLC Mode - 0(Off), 1(On), 2(Night Only)                                                                      |
|                 | HLC (D&N)                    | 8x 01 04 32 0p 0q FF       | p : HLC mode in day state<br>(0 : Off, 1 : On, 2 : Night only)<br>q : HLC mode in night state (0 : Off, 1 : On) |
|                 | Level                        | 8x 01 04 32 10 00 0p 0q FF | pq: HLC Level (0~14h)                                                                                           |
|                 | Clip Color                   | 8x 01 04 32 3p FF          | p : HLC color (0 : Black ~ Ah : White)                                                                          |
|                 | Area Start X                 | 8x 01 04 32 40 00 0p 0q FF | pq : Start horizontal position (0 ~ 26h)                                                                        |
|                 | Area Start Y                 | 8x 01 04 32 50 00 0p 0q FF | pq : Start vertical position (0 ~ 1Ah)                                                                          |
|                 | Area End X                   | 8x 01 04 32 60 00 0p 0q FF | pq : End horizontal position (9 ~ 3Eh)                                                                          |
|                 | Area End Y                   | 8x 01 04 32 70 00 0p 0q FF | pq : End vertical position (7 ~ 30H)                                                                            |
| CAM_DWDR        | On                           | 8x 01 04 1A 02 FF          | DWDR ON/OFF                                                                                                     |
|                 | Off                          | 8x 01 04 1A 03 FF          |                                                                                                                 |
|                 | Mode                         | 8x 01 04 1A 20 0p FF       | p : DWDR mode - 0(Manual), 1(Auto)                                                                              |
|                 | Auto Level                   | 8x 01 04 1A 30 0p FF       | p : Auto mode level (0:Low, 1:Middle, 2:High)                                                                   |
|                 | Dark Level                   | 8x 01 04 1A 40 0p 0q FF    | pq : Dark area level of manual mode (0 ~ 10h)                                                                   |
|                 | Bright Level                 | 8x 01 04 1A 50 0p 0q FF    | pq : Bright area level of manual mode<br>(0 ~ 10h)                                                              |
| CAM_Defog       | On                           | 8x 01 04 65 02 FF          | Defog ON/OFF                                                                                                    |
|                 | Off                          | 8x 01 04 65 03 FF          |                                                                                                                 |
|                 | Level                        | 8x 01 04 65 10 0p FF       | p : Manual mode level (0 ~ 8)                                                                                   |
|                 | Mode                         | 8x 01 04 65 20 0p FF       | p : Defog mode - 0(Manual), 1(Auto)                                                                             |
|                 | Auto level                   | 8x 01 04 65 30 0p FF       | p : Auto mode level (0:Low, 1:Middle, 2:High)                                                                   |
| CAM_DNR         | Mode                         | 8x 01 04 53 pq FF          | pq: NR level (0: Off, 1 ~ Fh: Level 1 to 15,<br>7Fh: 2D/3D NR independent setting available)                    |
|                 | 2D/3D NR independent setting | 8x 01 05 53 0p 0q FF       | p: 2D NR level (0 : Off, 01 ~ Fh : level 1 to 15)<br>q: 3D NR level (0 : Off, 01 ~ Fh : level 1 to 15)          |
| CAM_GAMMA       | Down                         | 8x 01 04 02 03 FF          | p: Gamma setting (0:0.35 ~ 7:0.70)                                                                              |
| CAM_Contrast    | Direct                       | 8x 01 05 5D 00 00 0p 0q FF | pq : Level (0 ~ 14h)                                                                                            |
| CAM_ImageBright | Direct                       | 8x 01 05 5E 00 00 0p 0q FF | pq : Level (0 ~ 14h)                                                                                            |
| CAM_Aperture    | 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 (0~Ah)                                                                                       |
|                 | Direct (D&N)                 | 8x 01 04 42 1p 0q 0r 0s FF | pq : Aperture gain of night state<br>rs : Aperture gain of day state (0 ~ Ah)                                   |
| 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          | Freeze Picture ON/OFF                                                                                           |
|                 | Off                          | 8x 01 04 62 03 FF          |                                                                                                                 |
| CAM_PictureFlip | On                           | 8x 01 04 66 02 FF          | Picture Reverse On/Off (Rotate 180 °)                                                                           |
|                 | Off                          | 8x 01 04 66 03 FF          |                                                                                                                 |



| Command                    | Command Setting    | Command Packet                                     | Comments                                                                                                                                                          |
|----------------------------|--------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_ICR                    | Night              | 8x 01 04 01 02 FF                                  | ICR Mode ON/OFF                                                                                                                                                   |
|                            | Day                | 8x 01 04 01 03 FF                                  |                                                                                                                                                                   |
|                            | Auto               | 8x 01 04 51 02 FF                                  | ICR is changed automatically by AGC Gain                                                                                                                          |
|                            | Ext-In             | 8x 01 04 51 05 FF                                  | ICR is changed by external input                                                                                                                                  |
|                            | Night Function Set | 8x 01 04 51 10 0p FF                               | p : Night mode function setting On/Off<br>(2 : On, 3 : Off)                                                                                                       |
|                            | Threshold          | 8x 01 04 21 00 00 0p 0q FF                         | pq: Threshold level of Auto mode (0 ~ 1Ch)                                                                                                                        |
|                            | Gap                | 8x 01 04 21 10 00 00 0p FF                         | pq: On/Off Threshold Gap of Auto mode<br>(0 ~ 4)                                                                                                                  |
|                            | Auto ICR Delay     | 8x 01 04 41 00 00 0p 0q FF                         | pq: Auto mode delay - 0(0sec) ~ FFh(255sec)                                                                                                                       |
|                            | Ext-In Delay       | 8x 01 04 71 00 00 0p 0q FF                         | pq: Ext-In mode delay<br>- 0(0sec) ~ FFh(255sec)                                                                                                                  |
|                            | Burst On           | 8x 01 04 72 02 FF                                  | CVBS ColorBurst signal On/Off                                                                                                                                     |
|                            | Burst Off          | 8x 01 04 72 03 FF                                  |                                                                                                                                                                   |
|                            | IR Detection On    | 8x 01 04 6E 02 FF                                  | IR Detection On/Off<br>If IR LED detected, Night mode is preserved                                                                                                |
|                            | IR Detection Off   | 8x 01 04 6E 03 FF                                  |                                                                                                                                                                   |
|                            | IR Detection Level | 8x 01 04 6E 10 0p FF                               | p: IR Detection Threshold Level ( 0 ~ 4h)                                                                                                                         |
| CAM_AutoICR<br>Alarm Reply | On                 | 8x 01 04 31 02 FF                                  | Auto ICR switching Alarm ON/OFF                                                                                                                                   |
|                            | Off                | 8x 01 04 31 03 FF                                  |                                                                                                                                                                   |
|                            | (Reply)            | y0 07 04 31 02 FF                                  | ICR OFF → ON                                                                                                                                                      |
|                            |                    | y0 07 04 31 03 FF                                  | ICR ON → OFF                                                                                                                                                      |
| CAM_Stabilizer             | On                 | 8x 01 04 34 02 FF                                  | Stabilizer ON/OFF/HOLD                                                                                                                                            |
|                            | Off                | 8x 01 04 34 03 FF                                  |                                                                                                                                                                   |
|                            | Hold               | 8x 01 04 34 00 FF                                  |                                                                                                                                                                   |
| CAM_MEMORY                 | Reset              | 8x 01 04 3F 00 0p FF                               | p: Memory number (0 ~ 9)                                                                                                                                          |
|                            | Set                | 8x 01 04 3F 01 0p FF                               |                                                                                                                                                                   |
|                            | Recall             | 8x 01 04 3F 02 0p FF                               |                                                                                                                                                                   |
| CAM_CUSTOM                 | Reset              | 8x 01 04 3F 00 7F FF                               | Starts in this mode at Power On                                                                                                                                   |
|                            | Set                | 8x 01 04 3F 01 7F FF                               |                                                                                                                                                                   |
|                            | Recall             | 8x 01 04 3F 02 7F FF                               |                                                                                                                                                                   |
| CAM_MemSave                | Write              | 8x 01 04 23 0t 0p 0q 0r 0s FF                      | t: 00 ~ 07 (Address) Total 16Byte<br>pqrs: 0000 ~ FFFFh (Data)                                                                                                    |
| CAM_Display                | On                 | 8x 01 04 15 02 FF                                  | Display ON/OFF                                                                                                                                                    |
|                            | Off                | 8x 01 04 15 03 FF                                  |                                                                                                                                                                   |
|                            | On/Off             | 8x 01 04 15 10 FF                                  |                                                                                                                                                                   |
| CAM_DisSel                 |                    | 8x 01 04 14 00 0p FF                               | Display Item On(1)/Off(0)<br>p: bit[0] - ID, bit[1] - Title, bit[2] - Zoom<br>Position, bit[3] - System Message                                                   |
| CAM_MultiLineTitle         | Title Set1         | 8x 01 04 73 1L 00 nn 0p<br>qq rr 00 00 00 00 FF    | L: Line Number (0 ~ Eh),<br>nn: H-Position (0 ~ 27h),<br>p : Color (0:White, 1: Yellow, 2: Black,<br>3: Red, 4: Gray, 5: Green)<br>qq : Blink, rr : Opening title |
|                            | Title Set2         | 8x 01 04 73 2L mm nn pp qq<br>rr ss tt uu vv ww FF | L: Line Number (0 ~ Eh)<br>mnpqrstuvw: Set of characters (1 ~ 10)                                                                                                 |
|                            | Title Set3         | 8x 01 04 73 3L mm nn pp qq<br>rr ss tt uu vv ww FF | L: Line Number (0 ~ Eh)<br>mnpqrstuvw: Set of characters (11~ 20)                                                                                                 |
|                            | Title Clear        | 8x 01 04 74 1p FF                                  | Title Set clear (p: 0 ~ Eh, Fh= all line)                                                                                                                         |
|                            | On                 | 8x 01 04 74 2p FF                                  | Title display On/Off (0 ~ Eh, Fh= all line)                                                                                                                       |
|                            | Off                | 8x 01 04 74 3p FF                                  |                                                                                                                                                                   |



| Command         | Command Setting   | Command Packet                                     | Comments                                                                                                                                                                                                                          |
|-----------------|-------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_MENUKey     | Up                | 8x 01 04 16 01 FF                                  |                                                                                                                                                                                                                                   |
|                 | Down              | 8x 01 04 16 02 FF                                  |                                                                                                                                                                                                                                   |
|                 | Left              | 8x 01 04 16 04 FF                                  |                                                                                                                                                                                                                                   |
|                 | Right             | 8x 01 04 16 08 FF                                  |                                                                                                                                                                                                                                   |
|                 | Menu              | 8x 01 04 16 10 FF                                  |                                                                                                                                                                                                                                   |
|                 | ESC               | 8x 01 04 16 20 FF                                  |                                                                                                                                                                                                                                   |
| CAM_User OSD    | Display String    | 8x 01 05 10 xx yy cc ss<br>"nnnnnnnnnnnn" FF       | xx: X position ( 0 ~ 27h )<br>yy: Y Position ( 0 ~ 11h )<br>cc: Color (0: White, 1: Yellow, 2: Black,<br>3: Red, 4: Gray, 5: Green)<br>ss: NORMAL = 00<br>INVERSE = 01<br>BLINK = 02<br>"nnnnn....": Display String (Max 26 char) |
|                 | Blue Screen       | 8x 01 05 20 0p FF                                  | p: Blue Screen Display - 0(Off), 1(On)                                                                                                                                                                                            |
|                 | Screen Clear      | 8x 01 05 30 01 FF                                  | Screen All clear                                                                                                                                                                                                                  |
| CAM_Mute        | On                | 8x 01 04 75 02 FF                                  | Mute ON/OFF                                                                                                                                                                                                                       |
|                 | Off               | 8x 01 04 75 03 FF                                  |                                                                                                                                                                                                                                   |
|                 | On/Off            | 8x 01 04 75 10 FF                                  |                                                                                                                                                                                                                                   |
| CAM_PrivacyZone | SetMask           | 8x 01 04 76 mm nn 0r 0r 0s<br>0s FF                | mm: MaskSettings<br>nn: 00=Modify, 01=New rr: W, ss: H                                                                                                                                                                            |
|                 | Display           | 8x 01 04 77 pp pp pp pp FF                         | Mask Display On/Off<br>pppppppp: MaskSettings (0: OFF, 1: ON)                                                                                                                                                                     |
|                 | SetMaskColor      | 8x 01 04 78 pp pp pp pp qq rr<br>FF                | pppppppp: Mask Color Settings<br>qq: Color Setting when 0 is selected<br>rr: Color Setting when 1 is selected                                                                                                                     |
|                 | SetPanTiltAngle   | 8x 01 04 79 0p 0p 0p<br>0q 0q 0q FF                | Pan/Tilt Angle Settings<br>ppp: Pan,<br>qqq: Tilt                                                                                                                                                                                 |
|                 | SetPTZMask        | 8x 01 04 7B mm 0p 0p 0p 0q<br>0q 0q 0r 0r 0r 0r FF | Pan/Tilt/Zoom Settings for Mask<br>mm: Mask Settings<br>ppp: Pan, qq: Tilt, rrr: Zoom                                                                                                                                             |
|                 | Non_InterlockMask | 8x 01 04 6F mm<br>0p 0p 0q 0q 0r 0r 0s 0s FF       | mm: Non-Interlock Mask Settings<br>pp: X, qq: Y, rr: W, ss: H                                                                                                                                                                     |
| CAM_KeyLock     | Off               | 8x 01 04 17 00 FF                                  | Key Lock ON/OFF                                                                                                                                                                                                                   |
|                 | On                | 8x 01 04 17 02 FF                                  |                                                                                                                                                                                                                                   |
| CAM_IDWrite     |                   | 8x 01 04 22 0p 0q 0r 0s FF                         | pqrs: Camera ID ( 0000 ~ FFFFh)                                                                                                                                                                                                   |



| Command                     | Command Setting                  | Command Packet                   | Comments                                                                                                                                                                                             |
|-----------------------------|----------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_TriggerMode             |                                  | 8x 01 04 55 0p FF                | p : Trigger mode (0:Free run, 1:Ext-trigger)                                                                                                                                                         |
| CAM_Trigger Function        | Trigger Polarity                 | 8x 01 04 55 10 0p FF             | p : Polarity setting (0:Active low, 1:Active high)                                                                                                                                                   |
|                             | Trigger Delay                    | 8x 01 04 55 11 0p 0q 0r FF       | pq : 0 (0ms) ~ FFh (255ms)<br>r : 0 (0.0ms) ~ 9 (0.9ms)                                                                                                                                              |
|                             | Strobe Polarity                  | 8x 01 04 55 20 0p FF             | p : Polarity setting (0:Active low, 1:Active high)                                                                                                                                                   |
|                             | Strobe Delay (Free run mode)     | 8x 01 04 55 21 0p 0q 0r FF       | pq : 0 (0ms)<br>~ 20h(32ms@30fps) / Fh(15ms@60fps) /<br>27h(39ms@25fps) / 13h(19ms@50fps)<br>r : 0 (0.0ms) ~ 9 (0.9ms)<br>※ Delay : 0 ~ (1 VD period - width)                                        |
|                             | Strobe Delay (Ext-Trigger mode)  | 8x 01 04 55 22 0p 0q 0r FF       | pq : 0 (0ms) ~ FFh (255ms)<br>r : 0 (0.0ms) ~ 9 (0.9ms)                                                                                                                                              |
|                             | Strobe Width (Free run mode)     | 8x 01 04 55 23 0p 0q 0r FF       | pq : 0 (1ms)<br>~ 20h(33ms@30fps) / Fh(16ms@60fps) /<br>27h(40ms@25fps) / 13h(20ms@50fps)<br>r : 0 (0.0ms) ~ 9 (0.9ms)<br>※ Delay : 1 ~ (1 VD period - delay)                                        |
|                             | Strobe Width (Ext-Trigger mode)  | 8x 01 04 55 24 0p 0q 0r FF       | pq : 0 (1ms) ~ FEh (255ms)<br>r : 0 (0.0ms) ~ 9 (0.9ms)                                                                                                                                              |
|                             | Strobe Mode                      | 8x 01 04 55 25 0p FF             | p : Strobe mode<br>(0:Off, 1:On, 2:Night only, 3:Day only)                                                                                                                                           |
|                             | ICR (Ext-Trigger mode)           | 8x 01 04 55 30 0p FF             | p : ICR mode (2 : Night, 3 : Day)                                                                                                                                                                    |
|                             | Shutter Speed (Ext-Trigger mode) | 8x 01 04 55 31 00 0p 0q FF       | pq : Shutter position<br>※ 30(25)fps - 5 : 1/30(25) ~ Fh : 1/20000<br>※ 60(50)fps - 6 : 1/60(50) ~ Fh : 1/20000                                                                                      |
|                             | Iris (Ext-Trigger mode)          | 8x 01 04 55 32 00 0p 0q FF       | pq : Iris position                                                                                                                                                                                   |
|                             | Gain (Ext-Trigger mode)          | 8x 01 04 55 33 00 0p 0q FF       | pq : Gain position                                                                                                                                                                                   |
| CAM_MD                      | On                               | 8x 01 04 1B 02 FF                | Motion Detection On/Off                                                                                                                                                                              |
|                             | Off                              | 8x 01 04 1B 03 FF                |                                                                                                                                                                                                      |
|                             | Function Set                     | 8x 01 04 1C 0m 0n 0p 0q 0r 0s FF | m: Display mode<br>n: Detection Frame Set<br>(bit[0]:1, bit[1]:2, bit[3]:3, bit[3]:4)<br>pq: Threshold Level (00 ~ 14h)<br>rs: Interval Time set (00 ~ FFh)                                          |
|                             | Window Set                       | 8x 01 04 1D 0m 0p 0q 0r 0s FF    | m: Select Detection Frame Number (0,1,2,4)<br>p: Start Horizontal Position (0 ~ Dh)<br>q: Start Vertical Position (0 ~ 7)<br>r: End Horizontal Position (1 ~ Eh)<br>s: End Vertical Position (1 ~ 8) |
|                             | MD Zoom Preset                   | 8x 01 04 1E 02 FF                | MD Zoom Preset On                                                                                                                                                                                    |
|                             |                                  | 8x 01 04 1E 03 FF                | MD Zoom Preset Off                                                                                                                                                                                   |
|                             | Set MD Zoom Pos                  | 8x 01 04 1E 10 FF                | Set MD Zoom preset to current zoom position                                                                                                                                                          |
| CAM_Continuous ZoomPosReply | Alarm (Reply)                    | y0 07 04 1B 0p FF                | p: Detection Frame Set                                                                                                                                                                               |
|                             | On                               | 8x 01 04 69 02 FF                | Zoom Position data continues output On/Off                                                                                                                                                           |
|                             | Off                              | 8x 01 04 69 03 FF                |                                                                                                                                                                                                      |
| CAM_Continuous ZoomPosReply | (Reply)                          | y0 07 04 69 0p 0p 0q 0q 0q 0q FF | pp: D-Zoom Position<br>* 00: When D-Zoom Mode is Combine<br>qqq: Zoom Position                                                                                                                       |
|                             |                                  |                                  |                                                                                                                                                                                                      |
| CAM_Reply IntervalTimeSet   |                                  | 8x 01 04 6A 00 00 0p 0q FF       | pq: Interval Time [Vertical timing]                                                                                                                                                                  |
| CAM_Register Value          |                                  | 8x 01 04 24 mm 0p 0q FF          | mm: Register No.<br>(0, 52h, 72h, 73h, 9Ah)<br>pq: Register Value                                                                                                                                    |



## VISCA Inquiry Command List

| Inquiry Command         | Command Packet    | Inquiry Packet       | Comments                                                                                                                                                                     |
|-------------------------|-------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_PowerInq            | 8x 09 04 00 FF    | y0 50 02 FF          | On                                                                                                                                                                           |
| CAM_ZoomPosInq          | 8x 09 04 47 FF    | y0 50 0p 0q 0r 0s FF | pqrs: Zoom Position                                                                                                                                                          |
| CAM_ZoomPresetInq       | 8x 09 04 67 FF    | Y0 50 00 00 0p 0q FF | pq: bit[0]:0 ~ bit[4]:4, (1:Set, 0:Unset)                                                                                                                                    |
| CAM_DZoomModelInq       | 8x 09 04 06 FF    | y0 50 02 FF          | D-Zoom On                                                                                                                                                                    |
|                         |                   | y0 50 03 FF          | D-Zoom Off                                                                                                                                                                   |
| CAM_DZoomC/SModelInq    | 8x 09 04 36 FF    | y0 50 00 FF          | Combine Mode                                                                                                                                                                 |
|                         |                   | y0 50 01 FF          | Separate Mode                                                                                                                                                                |
| CAM_DZoomPosInq         | 8x 09 04 46 FF    | y0 50 00 00 0p 0q FF | pq: D-Zoom Position                                                                                                                                                          |
| CAM_FocusModelInq       | 8x 09 04 38 FF    | y0 50 0p 0q FF       | p : Focus mode in day state<br>q : Focus mode in night state<br>(2 : Auto focus, 3 : Manual focus)                                                                           |
| CAM_FocusPosInq         | 8x 09 04 48 FF    | y0 50 0p 0q 0r 0s FF | pqrs: Focus Position                                                                                                                                                         |
| CAM_FocusNearLimitInq   | 8x 09 04 28 FF    | y0 50 0p 0q 0r 0s FF | pqrs: Focus Near Limit                                                                                                                                                       |
| CAM_AFModelInq          | 8x 09 04 57 FF    | y0 50 0p 0q FF       | p : AF mode in day state<br>q : AF mode in night state<br>(0 : Normal, 1 : Interval, 2 : Zoom trigger)                                                                       |
| CAM_AFStateInq          | 8x 09 04 26 FF    | y0 50 0p FF          | p: AF State - 0(Stop), 1(Run)                                                                                                                                                |
| CAM_AFTimeSettingInq    | 8x 09 04 27 FF    | y0 50 0p 0q 0r 0s FF | pq: Active Time, rs: Interval Time                                                                                                                                           |
| CAM_WBModelInq          | 8x 09 04 35 FF    | y0 50 00 FF          | Auto                                                                                                                                                                         |
|                         |                   | y0 50 01 FF          | Indoor                                                                                                                                                                       |
|                         |                   | y0 50 02 FF          | Outdoor                                                                                                                                                                      |
|                         |                   | y0 50 03 FF          | One Push AWB                                                                                                                                                                 |
|                         |                   | y0 50 05 FF          | Manual                                                                                                                                                                       |
|                         |                   | y0 50 07 FF          | Auto-extended                                                                                                                                                                |
| CAM_RGainInq            | 8x 09 04 43 FF    | y0 50 00 00 0p 0q FF | pq: R Gain (0~64h)                                                                                                                                                           |
| CAM_BGainInq            | 8x 09 04 44 FF    | y0 50 00 00 0p 0q FF | pq: B Gain (0~64h)                                                                                                                                                           |
| CAM_ChromaInq           | 8x 09 04 13 FF    | y0 50 00 00 0p 0q FF | pq: Chroma level (0~14h)                                                                                                                                                     |
| CAM_ColorHueInq         | 8x 09 04 4F FF    | y0 50 00 00 00 0p FF | p:Color hue setting (0 : -18° ~ 14h : +18°)                                                                                                                                  |
| CAM_AEModelInq          | 8x 09 04 39 FF    | y0 50 0p 0q FF       | p : AE mode in day state<br>q : AE mode in night state<br>(0 : Auto exposure, 3 : Manual control,<br>Ah : Shutter priority, Bh : Iris priority,<br>Dh : Bright mode)         |
| CAM_SlowShutterModelInq | 8x 09 04 5A FF    | y0 50 0p 0q FF       | p : Slow shutter mode in day state<br>q : Slow shutter mode in night state<br>(2 : Auto, 3 : Manual)                                                                         |
| CAM_MaxDSSLevInq        | 8x 09 04 5A 10 FF | y0 50 0p 0q FF       | p : Max slow shutter level in day state<br>q : Max slow shutter level night state<br>(0:x2, 1:x4, 2:x8, 3:x16, 4:x32, 5:x64)<br>※ You can't select "x64" in 30 or 25fps mode |
| CAM_ShutterPosInq       | 8x 09 04 4A FF    | y0 50 00 00 0p 0q FF | pq: Current Shutter Position                                                                                                                                                 |
| CAM_IrisPosInq          | 8x 09 04 4B FF    | y0 50 00 00 0p 0q FF | pq: Current Iris Position                                                                                                                                                    |
| CAM_GainPosInq          | 8x 09 04 4C FF    | y0 50 00 00 0p 0q FF | pq: Current Gain Position                                                                                                                                                    |
| CAM_GainLimitInq        | 8x 09 04 2C FF    | y0 50 0p 0q FF       | p : Auto gain limit position of day state<br>q : Auto gain limit position of night state                                                                                     |



| Inquiry Command         | Command Packet    | Inquiry Packet       | Comments                                                                                                        |
|-------------------------|-------------------|----------------------|-----------------------------------------------------------------------------------------------------------------|
| CAM_BrightPosInq        | 8x 09 04 4D FF    | y0 50 0p 0q 0r 0s FF | pq : Bright position of night state<br>rs : Bright position of day state                                        |
| CAM_ExpCompModelInq     | 8x 09 04 3E FF    | y0 50 0p 0q FF       | p : ExpComp mode in day state<br>q : ExpComp mode in night state<br>(2 : On, 3 : Off)                           |
| CAM_ExpCompPosInq       | 8x 09 04 4E FF    | y0 50 0p 0q 0r 0s FF | pq : ExpComp level of night state<br>rs : ExpComp level of day state (0 ~ Eh)                                   |
| CAM_FlickerlessInq      | 8x 09 04 7A FF    | y0 50 0p 0q FF       | p : Flickerless mode in day state<br>q : Flickerless mode in night state<br>(2 : On, 3 : Off, 4 : Auto)         |
| CAM_BLCModelInq         | 8x 09 04 33 FF    | y0 50 0p 0q FF       | p : BLC mode in day state<br>q : BLC mode in night state (2 : On, 3 : Off)                                      |
| CAM_BLCAreaInq          | 8x 09 04 3C 00 FF | y0 50 0p FF          | p: 0(Area OSD Off), 1(Area OSD On)                                                                              |
| CAM_BLC_StartXInq       | 8x 09 04 3C 10 FF | y0 50 00 00 0p 0q FF | pq: Start Horizontal Position (0 ~ 26h)                                                                         |
| CAM_BLC_StartYInq       | 8x 09 04 3C 20 FF | y0 50 00 00 0p 0q FF | pq: Start Vertical Position (0 ~ 1Ah)                                                                           |
| CAM_BLC_EndXInq         | 8x 09 04 3C 30 FF | y0 50 00 00 0p 0q FF | pq: End Horizontal Position (9 ~ 2Fh)                                                                           |
| CAM_BLC_EndYInq         | 8x 09 04 3C 40 FF | y0 50 00 00 0p 0q FF | pq: End Vertical Position (7 ~ 21H)                                                                             |
| CAM_BLC_LevelInq        | 8x 09 04 3C 50 FF | y0 50 00 00 0p 0q FF | pq : BLC area weight (0 ~ 6)                                                                                    |
| CAM_HLCModelInq         | 8x 09 04 32 00 FF | y0 50 0p 0q FF       | p : HLC mode in day state<br>(0 : Off, 1 : On, 2 : Night only)<br>q : HLC mode in night state (0 : Off, 1 : On) |
| CAM_HLCLevelInq         | 8x 09 04 32 10 FF | y0 50 00 00 0p 0q FF | pq: HLC Level (0 ~ 14h)                                                                                         |
| CAM_HLCColorInq         | 8x 09 04 32 30 FF | y0 50 0p FF          | p : HLC color (0 : Black ~ Ah : White)                                                                          |
| CAM_HLC_StartXInq       | 8x 09 04 32 40 FF | y0 50 00 00 0p 0q FF | pq : Start horizontal position (0 ~ 26h)                                                                        |
| CAM_HLC_StartYInq       | 8x 09 04 32 50 FF | y0 50 00 00 0p 0q FF | pq : Start vertical position (0 ~ 1Ah)                                                                          |
| CAM_HLC_EndXInq         | 8x 09 04 32 60 FF | y0 50 00 00 0p 0q FF | pq : End horizontal position (9 ~ 3Eh)                                                                          |
| CAM_HLC_EndYInq         | 8x 09 04 32 70 FF | y0 50 00 00 0p 0q FF | pq : End vertical position (7 ~ 30H)                                                                            |
| CAM_DWDRInq             | 8x 09 04 1A FF    | y0 50 02 FF          | On                                                                                                              |
|                         |                   | y0 50 03 FF          | Off                                                                                                             |
| CAM_DWDRModelInq        | 8x 09 04 1A 20 FF | y0 50 0p FF          | p : DWDR mode - 0(Manual), 1(Auto)                                                                              |
| CAM_DWDRAutoLevelInq    | 8x 09 04 1A 30 FF | y0 50 0p FF          | p : Auto mode level (0:Low, 1:Middle, 2:High)                                                                   |
| CAM_DWDRDarkLevelInq    | 8x 09 04 1A 40 FF | y0 50 0p 0q FF       | pq : Dark area level of manual mode (0 ~ 10h)                                                                   |
| CAM_DWDRBrightLevelInq  | 8x 09 04 1A 50 FF | y0 50 0p 0q FF       | pq : Bright area level of manual mode<br>(0 ~ 10h)                                                              |
| CAM_DefogInq            | 8x 09 04 65 FF    | y0 50 02 FF          | On                                                                                                              |
|                         |                   | y0 50 03 FF          | Off                                                                                                             |
| CAM_DefogLevelInq       | 8x 09 04 65 10 FF | y0 50 0p FF          | p: Defog Level (0 ~ 8)                                                                                          |
| CAM_DefogModelInq       | 8x 09 04 65 20 FF | y0 50 0p FF          | p: Defog Mode - 0(Manual), 1(Auto)                                                                              |
| CAM_DefogAutoLevelInq   | 8x 09 04 65 30 FF | y0 50 0p FF          | p : Auto mode level (0:Low, 1:Middle, 2:High)                                                                   |
| CAM_NRInq               | 8x 09 04 53 FF    | y0 50 pq FF          | pq: NR level (0 : Off, 1 ~ Fh : level 1 to 15,<br>7Fh: 2D/3D NR independent setting available)                  |
| CAM_NR2D3DInq           | 8x 09 05 53 FF    | y0 50 0p 0q FF       | p: 2D NR level (0 : Off, 01 ~ Fh : level 1 to 15)<br>q: 3D NR level (0 : Off, 01 ~ Fh : level 1 to 15)          |
| CAM_GammaInq            | 8x 09 04 5B FF    | y0 50 0p FF          | p: Gamma setting (0:0.35 ~ 7:0.70)                                                                              |
| CAM_ContrastInq         | 8x 09 05 5D FF    | y0 50 00 00 0p 0q FF | pq : Level (0 ~ 14h)                                                                                            |
| CAM_ImageBrightInq      | 8x 09 05 5E FF    | y0 50 00 00 0p 0q FF | pq : Level (0 ~ 14h)                                                                                            |
| CAM_ApertureInq         | 8x 09 04 42 FF    | y0 50 0p 0q 0r 0s FF | pq : Aperture gain of night state<br>rs : Aperture gain of day state (0 ~ Ah)                                   |
| 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_PictureFlipModelInq | 8x 09 04 66 FF    | y0 50 02 FF          | On                                                                                                              |
|                         |                   | y0 50 03 FF          | Off                                                                                                             |



| Inquiry Command           | Command Packet    | Inquiry Packet                         | Comments                                                                                                        |
|---------------------------|-------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| CAM_ICRStateInq           | 8x 09 04 01 FF    | y0 50 02 FF                            | Night                                                                                                           |
|                           |                   | y0 50 03 FF                            | Day                                                                                                             |
| CAM_ICRModelInq           | 8x 09 04 51 FF    | y0 50 02 FF                            | Night                                                                                                           |
|                           |                   | y0 50 03 FF                            | Day                                                                                                             |
|                           |                   | y0 50 04 FF                            | ICR is changed automatically by AGC Gain                                                                        |
|                           |                   | y0 50 06 FF                            | ICR is changed by external input                                                                                |
| CAM_ICRNightFuncSetInq    | 8x 09 04 51 10 FF | y0 50 02 FF                            | On                                                                                                              |
|                           |                   | y0 50 03 FF                            | Off                                                                                                             |
| CAM_ICRThresholdInq       | 8x 09 04 21 FF    | y0 50 00 00 0p 0q FF                   | pq : Threshold level of auto mode (0 ~ 1Ch)                                                                     |
| CAM_ICRGapInq             | 8x 09 04 21 10 FF | y0 50 0p FF                            | p: On/Off Threshold Gap of Auto mode(0 ~ 4)                                                                     |
| CAM_AutoICRDelayInq       | 8x 09 04 41 FF    | y0 50 00 00 0p 0q FF                   | pq: Auto mode delay - 0(0sec)~FFh(255sec)                                                                       |
| CAM_Ext-InICRDelayInq     | 8x 09 04 71 FF    | y0 50 00 00 0p 0q FF                   | pq: Ext-In mode delay - 0(0sec)~FFh(255sec)                                                                     |
| CAM_AutoICRAAlarmReplyInq | 8x 09 04 31 FF    | y0 50 02 FF                            | On                                                                                                              |
|                           |                   | y0 50 03 FF                            | Off                                                                                                             |
| CAM_BurstInq              | 8x 09 04 72 FF    | y0 50 02 FF                            | On                                                                                                              |
|                           |                   | y0 50 03 FF                            | Off                                                                                                             |
| CAM_IRDetectionInq        | 8x 09 04 6E FF    | y0 50 02 FF                            | On                                                                                                              |
|                           |                   | y0 50 03 FF                            | Off                                                                                                             |
| CAM_IRDetectionLevelInq   | 8x 09 04 6E 10 FF | y0 50 0p FF                            | p: IR Detection Threshold Level (0 ~ 4)                                                                         |
| CAM_StabilizerModelInq    | 8x 09 04 34 FF    | y0 05 02 FF                            | On                                                                                                              |
|                           |                   | y0 05 03 FF                            | Off                                                                                                             |
|                           |                   | y0 05 00 FF                            | Hold                                                                                                            |
| CAM_MemoryInq             | 8x 09 04 3F FF    | y0 50 0p FF                            | p: Last Recall Memory No.                                                                                       |
| CAM_MemSaveInq            | 8x 09 04 23 0t FF | y0 50 0p 0q 0r 0s FF                   | t: 0 ~ 7 (Address)<br>pqrs: 0000 ~ FFFFh (Data)                                                                 |
| CAM_DisplayInq            | 8x 09 04 15 FF    | y0 50 02 FF                            | On                                                                                                              |
|                           |                   | y0 50 03 FF                            | Off                                                                                                             |
| CAM_DispSelInq            | 8x 09 04 14 00 FF | y0 50 0p FF                            | Display Item On(1)/Off(0) p: bit[0] - ID,<br>bit[1] - Title,<br>bit[2] - Zoom Position bit[3] - System Message  |
| CAM_TitleDisplayModelInq  | 8x 09 04 74 FF    | y0 50 02 FF                            | On                                                                                                              |
|                           |                   | y0 50 03 FF                            | Off                                                                                                             |
| CAM_MenuModelInq          | 8x 09 04 16 FF    | y0 50 02 FF                            | OSD menu On                                                                                                     |
|                           |                   | y0 50 03 FF                            | OSD menu Off                                                                                                    |
| CAM_BlueScreenModelInq    | 8x 09 05 20 FF    | y0 50 0p FF                            | p : Blue screen display - 0(Off), 1(On)                                                                         |
| CAM_MuteModelInq          | 8x 09 04 75 FF    | y0 50 02 FF                            | On                                                                                                              |
|                           |                   | y0 50 03 FF                            | Off                                                                                                             |
| CAM_PrivacyPosInq         | 8x 09 04 76 mm FF | y0 50 0n 0p 0p 0q 0q<br>0r 0r 0s 0s FF | mm : Mask number<br>n : 0(Non-interlock mode), 1(Interlock mode)<br>pp : X, qq : Y, rr : W, ss : H              |
| CAM_PrivacyDisplayInq     | 8x 09 04 77 FF    | y0 50 pp pp pp pp FF                   | pppppppp: Mask Display (0: OFF, 1: ON)                                                                          |
| CAM_PrivacyColorInq       | 8x 09 04 78 FF    | y0 50 pp pp pp pp qq<br>rr FF          | pppppppp : Mask color setting<br>qq : Color setting when 0 is selected<br>rr : Color setting when 1 is selected |
| CAM_PrivacyPanTiltInq     | 8x 09 04 79 FF    | y0 50 0p 0p 0p 0q 0q<br>0q FF          | ppp: Pan, qq: Tilt                                                                                              |



| Inquiry Command                        | Command Packet    | Inquiry Packet                            | Comments                                                                                                                                                                                                     |
|----------------------------------------|-------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_PrivacyPTZInq                      | 8x 09 04 7B mm FF | y0 50 0p 0p 0p 0q 0q<br>0q 0r 0r 0r 0r FF | mm: Mask Settings<br>ppp: Pan, qq: Tilt, rrr: Zoom                                                                                                                                                           |
| CAM_PrivacyMonitorInq                  | 8x 09 04 6F FF    | y0 50 pp pp pp pp FF                      | pppppppp: Mask is displayed now                                                                                                                                                                              |
| CAM_KeyLockInq                         | 8x 09 04 17 FF    | y0 50 02 FF                               | On                                                                                                                                                                                                           |
|                                        |                   | y0 50 00 FF                               | Off                                                                                                                                                                                                          |
| CAM_IDInq                              | 8x 09 04 22 FF    | y0 50 0p 0q 0r 0s FF                      | pqrs: Camera ID                                                                                                                                                                                              |
| CAM_TriggerModeInq                     | 8x 09 04 55 FF    | y0 50 0p FF                               | p : Trigger mode (0:Free run, 1:Ext-trigger)                                                                                                                                                                 |
| CAM_TriggerPolarityInq                 | 8x 09 04 55 10 FF | y0 50 0p FF                               | p : Polarity setting (0:Active low, 1:Active high)                                                                                                                                                           |
| CAM_TriggerDelayInq                    | 8x 09 04 55 11 FF | y0 50 00 0p 0q 0r FF                      | pq : 0 (0ms) ~ FFh (255ms)<br>r : 0 (0.0ms) ~ 9 (0.9ms)                                                                                                                                                      |
| CAM_StrobePolarityInq                  | 8x 09 04 55 20 FF | y0 50 0p FF                               | p : Polarity setting (0:Active low, 1:Active high)                                                                                                                                                           |
| CAM_StrobeDelayInq (Free run mode)     | 8x 09 04 55 21 FF | y0 50 00 0p 0q 0r FF                      | pq : 0 (0ms)<br>~ 20h(32ms@30fps) / Fh(15ms@60fps) /<br>27h(39ms@25fps) / 13h(19ms@50fps)<br>r : 0 (0.0ms) ~ 9 (0.9ms)<br>※ Delay : 0 ~ (1 VD period - width)                                                |
| CAM_StrobeDelayInq (Ext-Trigger mode)  | 8x 09 04 55 22 FF | y0 50 00 0p 0q 0r FF                      | pq : 0 (0ms) ~ FFh (255ms)<br>r : 0 (0.0ms) ~ 9 (0.9ms)                                                                                                                                                      |
| CAM_StrobeWidthInq (Free run mode)     | 8x 09 04 55 23 FF | y0 50 00 0p 0q 0r FF                      | pq : 0 (1ms)<br>~ 20h(33ms@30fps) / Fh(16ms@60fps) /<br>27h(40ms@25fps) / 13h(20ms@50fps)<br>r : 0 (0.0ms) ~ 9 (0.9ms)<br>※ Delay : 1 ~ (1 VD period - delay)                                                |
| CAM_StrobeWidthInq (Ext-Trigger mode)  | 8x 09 04 55 24 FF | y0 50 00 0p 0q 0r FF                      | pq : 0 (1ms) ~ FEh (255ms)<br>r : 0 (0.0ms) ~ 9 (0.9ms)                                                                                                                                                      |
| CAM_StrobeModeInq                      | 8x 09 04 55 25 FF | y0 50 0p FF                               | p : Strobe mode<br>(0:Off, 1:On, 2:Night only, 3:Day only)                                                                                                                                                   |
| CAM_TriggerFncICRInq                   | 8x 09 04 55 30 FF | y0 50 0p FF                               | p : ICR mode (2 : Night, 3 : Day)                                                                                                                                                                            |
| CAM_TriggerFncShutterInq               | 8x 09 04 55 31 FF | y0 50 00 00 0p 0q FF                      | pq : Shutter position                                                                                                                                                                                        |
| CAM_TriggerFncIrisInq                  | 8x 09 04 55 32 FF | y0 50 00 00 0p 0q FF                      | pq : Iris position                                                                                                                                                                                           |
| CAM_TriggerFncGain                     | 8x 09 04 55 33 FF | y0 50 00 00 0p 0q FF                      | pq : Gain position                                                                                                                                                                                           |
| CAM_VersionInq                         | 8x 09 00 02 FF    | y0 50 00 20 mn pq rs<br>tu vw FF          | mnpq : Model code (0466h) rstu : ROM<br>version (0100h) vw : Socket number (3)                                                                                                                               |
| CAM_ModelInq                           | 8x 09 00 37 FF    | y0 50 pp pp pp qq rr<br>FF                | pppppp : Model code : YY1F52h<br>(YY : Custom. code, standard model = 00)<br>qqrr : Version (Ver.qq.rr)                                                                                                      |
| CAM_MDModelInq                         | 8x 09 04 1B FF    | y0 50 02 FF                               | On                                                                                                                                                                                                           |
|                                        |                   | y0 50 03 FF                               | Off                                                                                                                                                                                                          |
| CAM_MDFunctionInq                      | 8x 09 04 1C FF    | y0 50 0m 0n 0p 0q 0r<br>0s FF             | m : Display mode<br>n : Detection frame set<br>(bit[0]:1, bit[1]:2, bit[2]:3, bit[3]:4)<br>pq: Threshold level (00~14h)<br>rs : Interval time set (00 ~ FFh)                                                 |
| CAM_MDWindowInq                        | 8x 09 04 1D 0m FF | y0 50 0p 0q 0r 0s FF                      | m : Select detection frame number (0, 1, 2, 3)<br>p : Start horizontal position (0 ~ Dh)<br>q : Start vertical position (0 ~ 7)<br>r : End horizontal position (1 ~ Eh)<br>s : End vertical position (1 ~ 8) |
| CAM_MDZoomPresetInq                    | 8x 09 04 1E FF    | y0 50 02 FF                               | On                                                                                                                                                                                                           |
|                                        |                   | y0 50 03 FF                               | Off                                                                                                                                                                                                          |
| CAM_ContinuousZoomPos<br>ReplyModelInq | 8x 09 04 69 FF    | y0 50 02 FF                               | On                                                                                                                                                                                                           |
|                                        |                   | y0 50 03 FF                               | Off                                                                                                                                                                                                          |
| CAM_ReplyIntervalTimeInq               | 8x 09 04 6A FF    | y0 50 00 00 0p 0p FF                      | pp: Interval time                                                                                                                                                                                            |
| CAM_RegisterValueInq                   | 8x 09 04 24 mm FF | y0 50 0p 0p FF                            | mm : Register No.<br>(0, 52h, 72h, 73h, 9Ah)<br>pp : Register value                                                                                                                                          |



## Exposure Control Values

## Shutter Speed (Hex)

| Step (Hex) | 60Hz/30Hz /NTSC | 50Hz/25Hz /PAL |
|------------|-----------------|----------------|
| 10         | 1/40000         | 1/40000        |
| 0F         | 1/20000         | 1/20000        |
| 0E         | 1/10000         | 1/10000        |
| 0D         | 1/5000          | 1/5000         |
| 0C         | 1/2000          | 1/2000         |
| 0B         | 1/1000          | 1/1000         |
| 0A         | 1/500           | 1/500          |
| 09         | 1/250           | 1/250          |
| 08         | 1/120           | 1/120          |
| 07         | 1/100           | 1/100          |
| 06         | 1/60            | 1/50           |
| 05         | 1/30            | 1/25           |
| 04         | 1/15            | 1/12           |
| 03         | 1/8             | 1/6            |
| 02         | 1/4             | 1/3            |
| 01         | 1/2             | 1/2            |
| 00         | 1/1             | 1/1            |

## Iris (Hex)

| Value | Iris   |
|-------|--------|
| 12    | F1.7   |
| 11    | F1.8   |
| 10    | F2.0   |
| 0F    | F2.4   |
| 0E    | F2.8   |
| 0D    | F3.4   |
| 0C    | F4.0   |
| 0B    | F4.8   |
| 0A    | F5.6   |
| 09    | F6.8   |
| 08    | F8.0   |
| 07    | F9.6   |
| 06    | F11    |
| 05    | F14    |
| 04    | F16    |
| 00    | Closed |

## Bright (Hex)

| Step | IRIS   | GAIN   |
|------|--------|--------|
| 1C   | F1.7   | 48.0dB |
| 1B   | F1.7   | 43.2dB |
| 1A   | F1.7   | 38.4dB |
| 19   | F1.7   | 33.6dB |
| 18   | F1.7   | 28.8dB |
| 17   | F1.7   | 24.0dB |
| 16   | F1.7   | 19.2dB |
| 15   | F1.7   | 14.4dB |
| 14   | F1.7   | 9.6dB  |
| 13   | F1.7   | 4.8dB  |
| 12   | F1.7   | 0dB    |
| 11   | F1.8   | 0dB    |
| 10   | F2.0   | 0dB    |
| 0F   | F2.4   | 0dB    |
| 0E   | F2.8   | 0dB    |
| 0D   | F3.4   | 0dB    |
| 0C   | F4.0   | 0dB    |
| 0B   | F4.8   | 0dB    |
| 0A   | F5.6   | 0dB    |
| 09   | F6.8   | 0dB    |
| 08   | F8.0   | 0dB    |
| 07   | F9.6   | 0dB    |
| 06   | F11    | 0dB    |
| 05   | F14    | 0dB    |
| 04   | F16    | 0dB    |
| 00   | Closed | 0dB    |

## Gain (Hex)

| Step | dB     |
|------|--------|
| 0A   | 48.0dB |
| 09   | 43.2dB |
| 08   | 38.4dB |
| 07   | 33.6dB |
| 06   | 28.8dB |
| 05   | 24.0dB |
| 04   | 19.2dB |
| 03   | 14.4dB |
| 02   | 9.6dB  |
| 01   | 4.8dB  |
| 00   | 0dB    |

## Exposure comp. (Hex)

| Value | Iris  |
|-------|-------|
| 0E    | +10.5 |
| 0D    | +9    |
| 0C    | +7.5  |
| 0B    | +6    |
| 0A    | +4.5  |
| 09    | +3    |
| 08    | +1.5  |
| 07    | 0     |
| 06    | -1.5  |
| 05    | -3    |
| 04    | -4.5  |
| 03    | -6    |
| 02    | -7.5  |
| 01    | -9    |
| 00    | -10.5 |



## Zoom &amp; Focus Control Values

## Optical Zoom

| Zoom | Zoom Position |
|------|---------------|
| ×1   | 0000          |
| ×2   | 28C0          |
| ×3   | 3062          |
| ×4   | 34C2          |
| ×5   | 37C3          |
| ×6   | 39FE          |
| ×7   | 3BE1          |
| ×8   | 3D6D          |
| ×9   | 3ECC          |
| ×10  | 4000          |

## Focus Near Limit

| Set Value | Distance      |
|-----------|---------------|
| 1000      | Over infinity |
| 2000      | 30m           |
| 3000      | 10m           |
| 4000      | 6m            |
| 5000      | 5m            |
| 6000      | 4m            |
| 7000      | 3m            |
| 8000      | 2.7m          |
| 9000      | 2.4m          |
| A000      | 2m            |
| B000      | 1.9m          |
| C000      | 1.7m          |
| D000      | 1.4m          |
| E000      | 1m            |
| F000      | Macro         |

## D-Zoom: Combined Mode

| Magnification | Zoom Position |
|---------------|---------------|
| x1            | 4000          |
| x2            | 6000          |
| x3            | 6A80          |
| x4            | 7000          |
| x5            | 7300          |
| x6            | 7540          |
| x7            | 76C0          |
| x8            | 7800          |
| x9            | 78C0          |
| x10           | 7980          |
| x11           | 7A00          |
| x12           | 7AC0          |
| x13           | 7B40          |
| x14           | 7B80          |
| x15           | 7BC0          |
| x16           | 7C00          |
| x17           | 7C40          |
| x18           | 7C80          |
| x19           | 7CC0          |
| x21           | 7D00          |
| x23           | 7D40          |
| x25           | 7D80          |
| x28           | 7DC0          |
| x32           | 7E00          |

## D-Zoom: Separate Mode

| Magnification | Zoom Position |
|---------------|---------------|
| x1            | 00            |
| x2            | 80            |
| x3            | AA            |
| x4            | C0            |
| x5            | CC            |
| x6            | D5            |
| x7            | DB            |
| x8            | E0            |
| x9            | E3            |
| x10           | E6            |
| x11           | E8            |
| x12           | EB            |
| x13           | ED            |
| x14           | EE            |
| x15           | EF            |
| x16           | F0            |
| x17           | F1            |
| x18           | F2            |
| x19           | F3            |
| x21           | F4            |
| x23           | F5            |
| x25           | F6            |
| x28           | F7            |
| x32           | F8            |

**Wide/Tele Limit Setting**

| Wide/Tele Limit Setting Value | Wide Limit    |            | Tele Limit    |            |
|-------------------------------|---------------|------------|---------------|------------|
| Limit Setting Value           | Zoom Position | Zoom Ratio | Zoom Position | Zoom Ratio |
| 00                            | 0000          | 1.00       | 4000          | 10.00      |
| 10                            | 0175          | 1.04       | 3F42          | 9.65       |
| 20                            | 02ED          | 1.08       | 3E87          | 9.33       |
| 30                            | 0468          | 1.13       | 3DCA          | 9.00       |
| 40                            | 05E0          | 1.18       | 3D0F          | 8.70       |
| 50                            | 0758          | 1.23       | 3C52          | 8.40       |
| 60                            | 08D0          | 1.28       | 3B94          | 8.12       |
| 70                            | 0A48          | 1.33       | 3ADA          | 7.84       |
| 80                            | 0BC0          | 1.39       | 3A1C          | 7.58       |
| 90                            | 0D3B          | 1.45       | 395F          | 7.33       |
| A0                            | 0EB3          | 1.52       | 38A4          | 7.08       |
| B0                            | 102B          | 1.59       | 37E7          | 6.85       |
| C0                            | 11A4          | 1.66       | 372C          | 6.63       |
| D0                            | 131C          | 1.73       | 366F          | 6.41       |
| E0                            | 1494          | 1.82       | 35B4          | 6.21       |
| F0                            | 160C          | 1.90       | 34F7          | 6.01       |
| FF                            | 176E          | 1.99       | 3447          | 5.83       |



## OSD character values

|            |          |                              |
|------------|----------|------------------------------|
| V position | 00 ~ 0Eh | 15 Rows (CAM_MultiLineTitle) |
|            | 00 ~ 11h | 17 Rows (CAM_User OSD)       |
| H position | 00 ~ 27h | 40 Columns                   |

Character code:

| Code | Character | Code | Character | Code | Character | Code | Character |
|------|-----------|------|-----------|------|-----------|------|-----------|
| 00   | Space     | 21   | A         | 42   | b         | 63   | Ç         |
| 01   | !         | 22   | B         | 43   | c         | 64   | È         |
| 02   | "         | 23   | C         | 44   | d         | 65   | É         |
| 03   | #         | 24   | D         | 45   | e         | 66   | Ê         |
| 04   | \$        | 25   | E         | 46   | f         | 67   | Ë         |
| 05   | %         | 26   | F         | 47   | g         | 68   | Î         |
| 06   | &         | 27   | G         | 48   | h         | 69   | Ï         |
| 07   |           | 28   | H         | 49   | i         | 6A   | Ñ         |
| 08   | (         | 29   | I         | 4A   | j         | 6B   | Ô         |
| 09   | )         | 2A   | J         | 4B   | k         | 6C   | Ö         |
| 0A   | *         | 2B   | K         | 4C   | l         | 6D   | Ù         |
| 0B   | +         | 2C   | L         | 4D   | m         | 6E   | Û         |
| 0C   | ,         | 2D   | M         | 4E   | n         | 6F   | Ü         |
| 0D   | -         | 2E   | N         | 4F   | o         | 70   | ß         |
| 0E   | .         | 2F   | O         | 50   | p         | 71   | à         |
| 0F   | /         | 30   | P         | 51   | q         | 72   | â         |
| 10   | 0         | 31   | Q         | 52   | r         | 73   | ä         |
| 11   | 1         | 32   | R         | 53   | s         | 74   | ç         |
| 12   | 2         | 33   | S         | 54   | t         | 75   | è         |
| 13   | 3         | 34   | T         | 55   | u         | 76   | é         |
| 14   | 4         | 35   | U         | 56   | v         | 77   | ê         |
| 15   | 5         | 36   | V         | 57   | w         | 78   | ë         |
| 16   | 6         | 37   | W         | 58   | x         | 79   | î         |
| 17   | 7         | 38   | X         | 59   | y         | 7A   | ï         |
| 18   | 8         | 39   | Y         | 5A   | z         | 7B   | ñ         |
| 19   | 9         | 3A   | Z         | 5B   | {         | 7C   | ó         |
| 1A   | :         | 3B   | [         | 5C   |           | 7D   | ö         |
| 1B   | ;         | 3C   | \         | 5D   | }         | 7E   | ù         |
| 1C   | <         | 3D   | ]         | 5E   | ~         | 7F   | û         |
| 1D   | =         | 3E   | ^         | 5F   |           | 80   | ü         |
| 1E   | >         | 3F   | _         | 60   | À         | 81   | Œ         |
| 1F   | ?         | 40   | `         | 61   | Â         | 82   | œ         |
| 20   | @         | 41   | a         | 62   | Ä         |      |           |

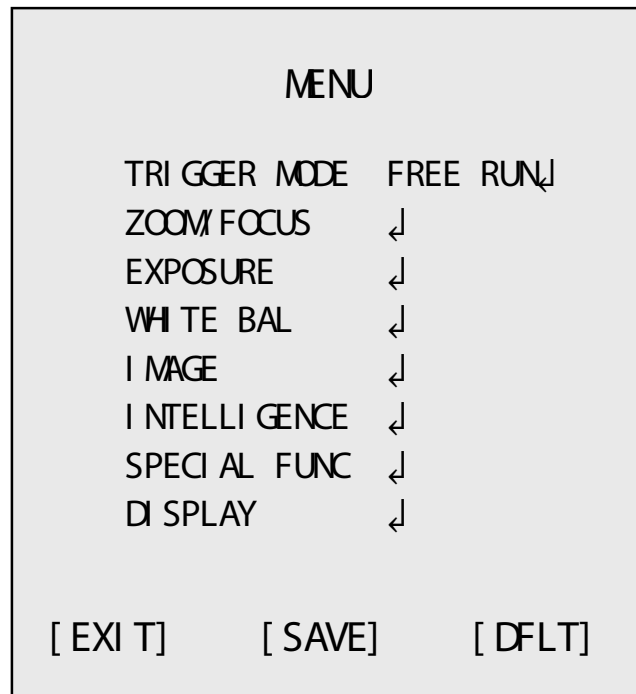


## Register Settings

| Function         | Register No. | Register Value                | Setting                                    |
|------------------|--------------|-------------------------------|--------------------------------------------|
| BaudRate         | 00           | 10                            | 2400 bps                                   |
|                  |              | 11                            | 4800 bps                                   |
|                  |              | 00                            | 9600 bps                                   |
|                  |              | 01                            | 19200 bps                                  |
|                  |              | 02                            | 38400 bps                                  |
|                  |              | 03                            | 57600 bps                                  |
|                  |              | 04                            | 115200 bps                                 |
| Zoom Limit       | 50           | 00-FF<br>(Initial Setting:00) | Wide Limit (0: Disabled)                   |
|                  | 51           | 00-FF<br>(Initial Setting:00) | Tele Limit (0: Disabled)                   |
| D.ZOOM Max       | 52           | 00 ~ F8                       | Max. D.Zoom Ratio<br>= 256 / (256 - Value) |
| Monitoring Mode  | 72           | 06                            | 1080p/30fps                                |
|                  |              | 08                            | 1080p/25fps                                |
|                  |              | 09                            | 720p/60fps                                 |
|                  |              | 0C                            | 720p/50fps                                 |
|                  |              | 0E                            | 720p/30fps                                 |
|                  |              | 11                            | 720p/25fps                                 |
|                  |              | 13                            | 1080p/60fps                                |
| LVDS mode        | 74           | 0                             | Single output                              |
|                  |              | 1                             | Dual output                                |
| HD delay         | 75           | 0                             | Delay disabled                             |
|                  |              | 1                             | Delay enabled                              |
| VD / HD polarity | 7A           | 0                             | Positive                                   |
|                  |              | 1                             | Negative                                   |

## OSD Menu

### ◆ Main Menu



Functions can be setup using “Menu Key Command” of Visca protocol. The menu consists of the “Main Menu” and “Sub Menu”.

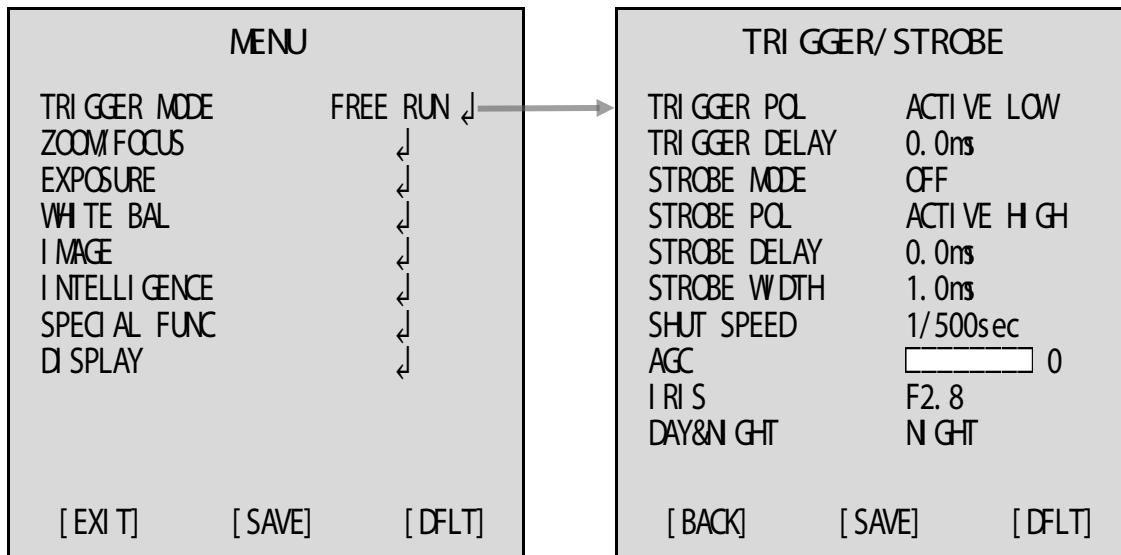
The main menu is displayed where 8 camera functions can be selected. To the push of each main menu selection, the sub-menu is displayed.

If you want to save the menu, select **[SAVE]**.

If you don't want to save the menu, select **[EXIT]** (After select, Power off -> on)

If you want default the menu, select **[DFLT]**

## ◆ TRIGGER MODE



### ● TRIGGER MODE

Select trigger mode

- ▶ FREE RUN : Continuous image output mode.
- ▶ EXT-TRIGGER : External trigger synchronous image output mode.

※ When Ext-trigger mode is selected, focus mode does not work and exposure mode are forced into manual mode.

### ● TRIGGER POL

Select the polarity of the external trigger signal.

- ▶ ACTIVE LOW / ACTIVE HIGH

### ● TRIGGER DELAY

Sets the delay time from the external trigger input to the image capture start.

- ▶ 0 ~ 255.9ms

### ● STROBE MODE

Select the output mode of the strobe output signal.

- ▶ OFF / ON / NIGHT / DAY

### ● STROBE POL

Select the polarity of the strobe output signal.

- ▶ ACTIVE LOW / ACTIVE HIGH

- STROBE DELAY

Sets the delay time from the trigger signal to the strobe on signal output.

- ▶ 0 ~ 255.9ms (※ Ext-trigger mode)
- ▶ 0 ~ (33.3 – width)ms @30fps, 0 ~ (16.6 – width)ms @60fps,  
0 ~ (40 – width)ms @25fps, 0 ~ (20 – width)ms @50fps (※ Free run mode)

- STROBE WIDTH

Sets the length of the strobe on signal.

- ▶ 1 ~ 255.9ms (※ Ext-trigger mode)
- ▶ 1 ~ (33.3 – delay)ms @30fps, 1 ~ (16.6 – delay)ms @60fps,  
1 ~ (40 – delay)ms @25fps, 1 ~ (20 – delay)ms @50fps (※ Free run mode)

- SHUT SPEED

Set the shutter speed used only in Ext-Trigger mode.

- ▶ 1/30(25), 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000sec, 1/40000sec (※ 30 or 25fps mode)
- ▶ 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000sec, 1/40000sec (※ 60 or 50fps mode)

- AGC

Set the Manual Gain used only in Ext-Trigger mode.

- ▶ 0 ~ 10 steps

- IRIS

Set the Manual Iris used only in Ext-Trigger mode.

- ▶ CLOSE / F1.7 / F1.8 / F2.0 / F2.4 / F2.8 / F3.4 / F4.0 / F4.8 / F5.6 / F6.8 / F8.0 / F9.6 / F11 / F14 / F16

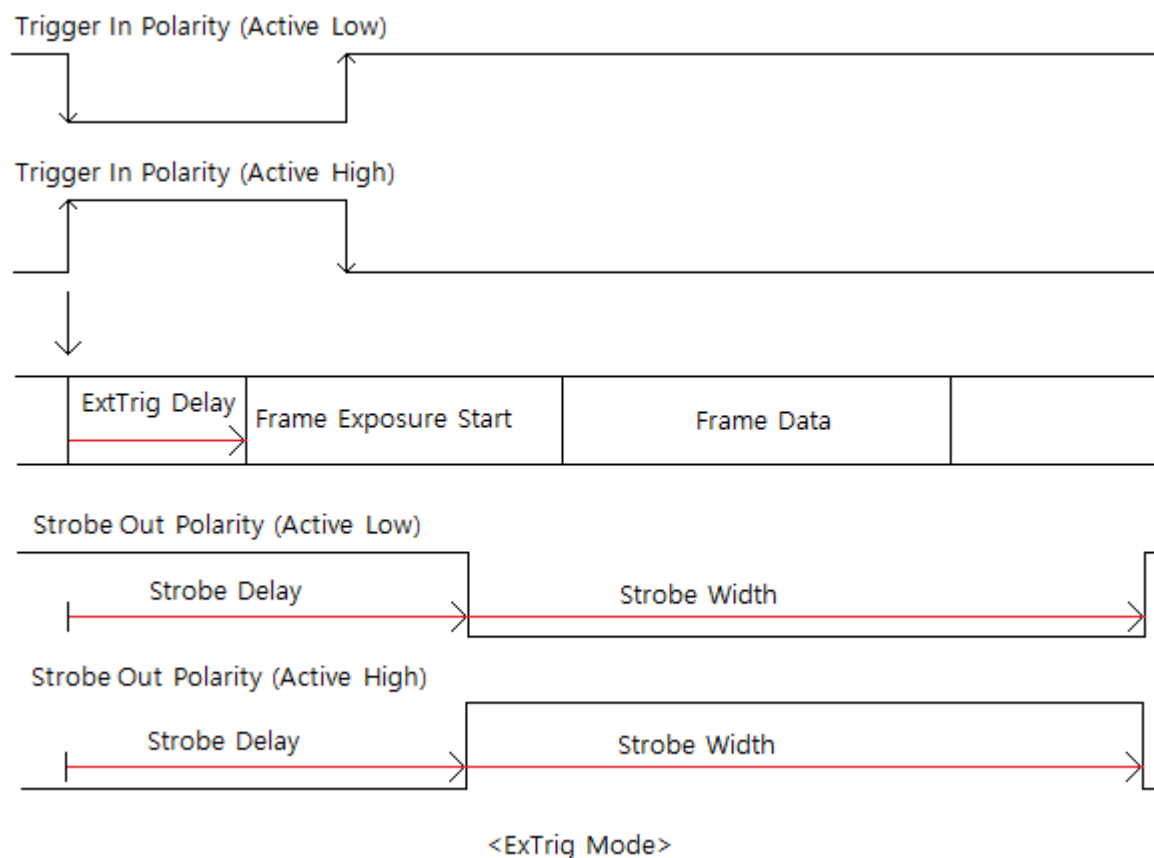
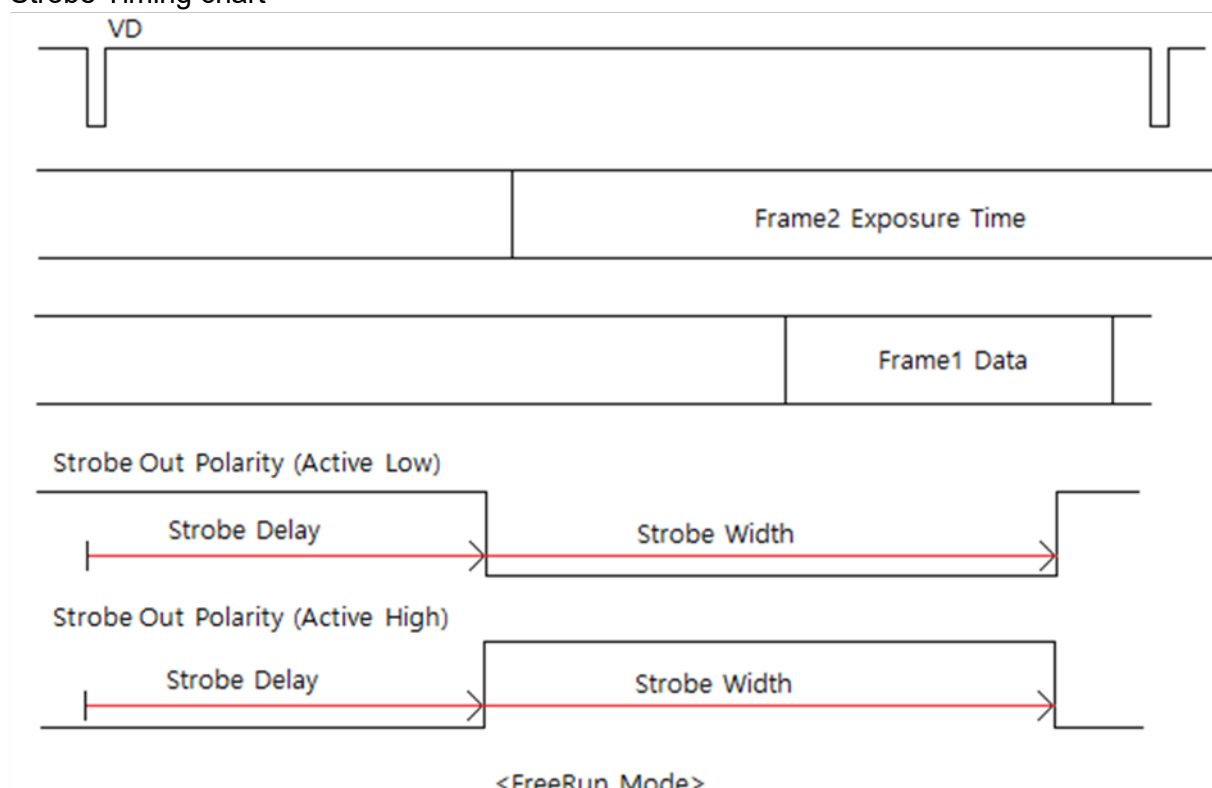
- DAY&NIGHT

Select whether to use Day or Night when in Ext-Trigger mode.

- ▶ DAY / NIGHT

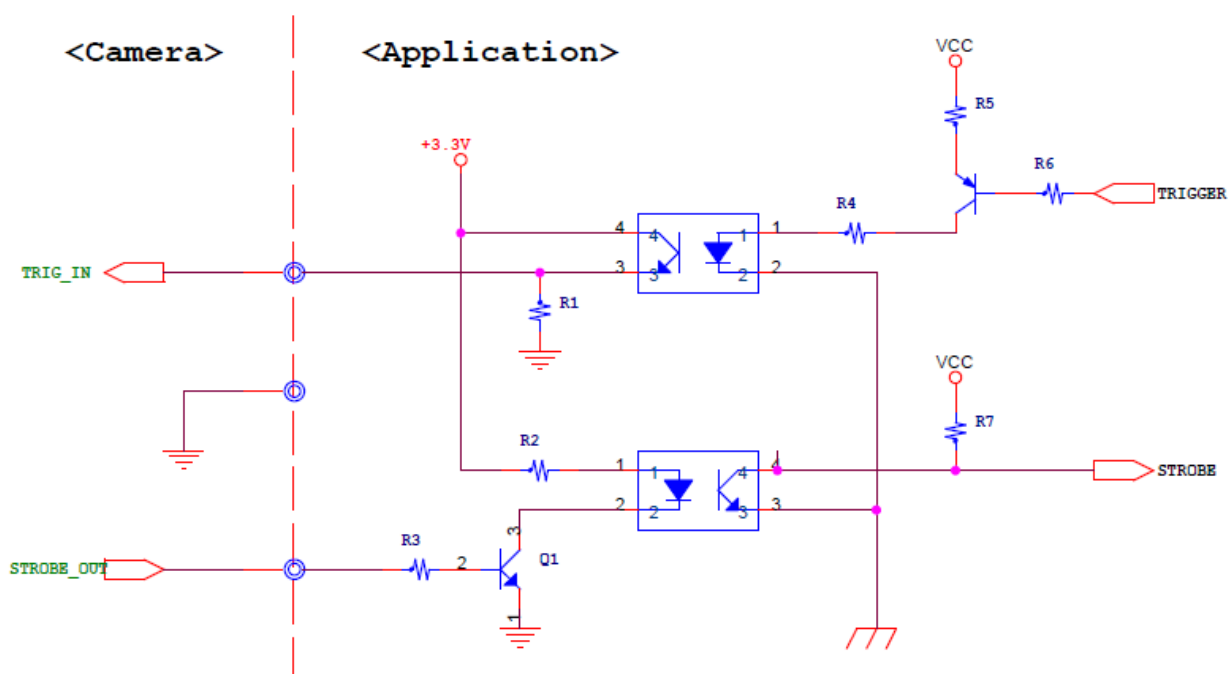
※ If you don't change exposure settings in the TRIGGER menu, exposure state is automatically set just before switching to the Ext-trigger mode.

# ※ Strobe Timing chart

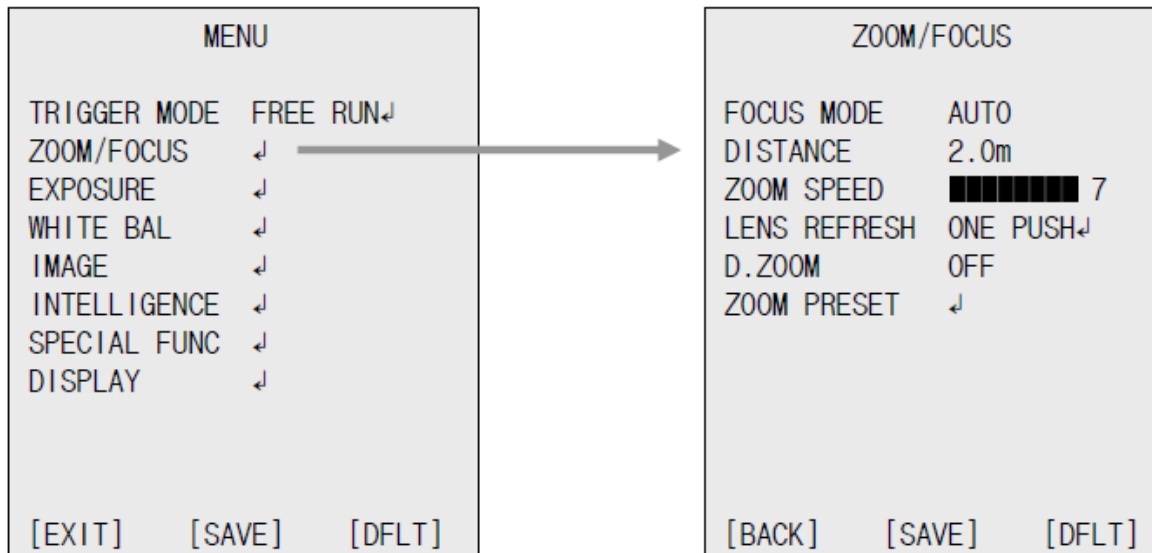


# ※ Electrical interface: Trigger and Strobe

- An input for external triggering of the camera is available at the I/O connector.  
 Also, a strobe output signal from the camera to control an external flashlight is available at the I/O connector.  
 The input and output require galvanic isolated from the outside electronics by means of an optocoupler.
- The recommended termination circuitry is drawn below.

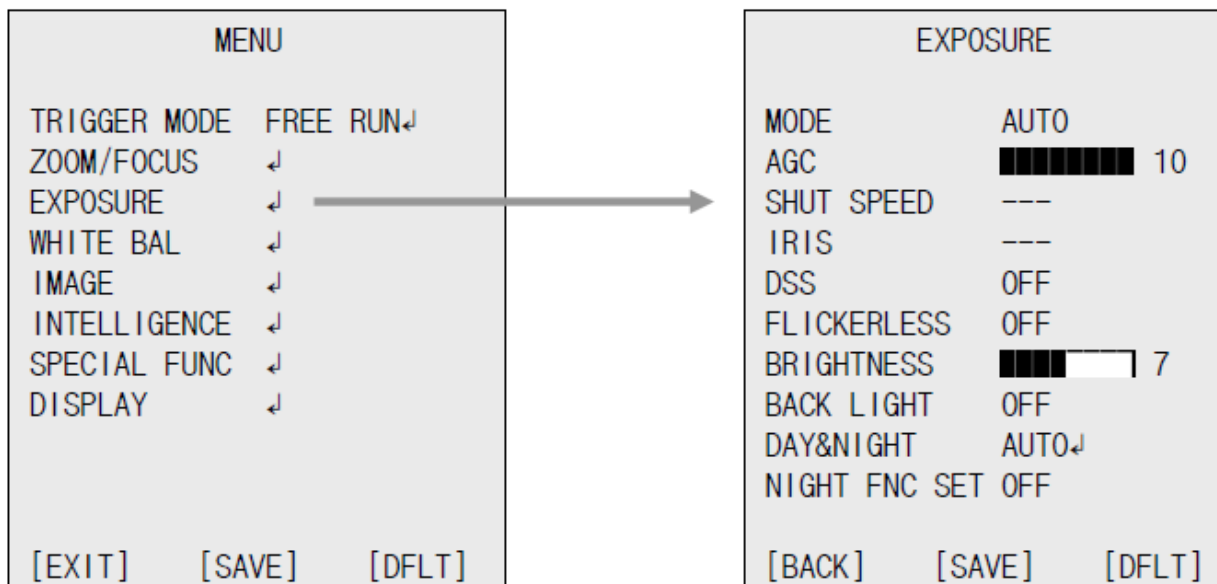


## ◆ ZOOM/FOCUS



- FOCUS Mode: Select auto focus mode
  - ▶ AUTO, ONE PUSH, MANUAL
  - ※ In Ext-Trigger Mode, You cannot move zoom and focus.
- DISTANCE: Select minimum distance in focus between camera and object.
  - ▶ 0.1 / 1.0 / 3.0 / 5.0 / 10.0 m
- ZOOM SPEED: Select Zoom Speed
  - ▶ 0 (Slow) ~ 7 (Fast)
- LENS REFRESH: Lens origin calibrated automatically.
  - ▶ ONE PUSH↓ / ON (1 day ~ 10 days)
- D.ZOOM: Select maximum digital zoom magnification.
  - ▶ OFF / ON (max x2 ~ x19, x21, x23, x25, x28, x32)
  - ※ The Digital Zoom cannot be used with the DIS function.
- ZOOM PRESET: Select zoom preset
  - ▶ PRESET #: Select Zoom preset number (1 ~ 5)
  - ▶ MODE: OFF / ON↓ (Adjust the Zoom Position)

## ◆ EXPOSURE



- **MODE:** Select Exposure Mode
  - ▶ AUTO / IRIS.P / SHUT.P / MANUAL
  - ※ In Ext-Trigger Mode, it is fixed to Manual mode.
- **AGC:** Select Auto Gain limit (AUTO, IRIS.P and SHUT.P Mode) or manual gain (manual mode).
  - ▶ 0 ~ 10 steps
- **SHUT SPEED:** Can be set in SHUT.P or MANUAL mode
  - ▶ 1/1, 1/2, 1/4(3), 1/8(6), 1/15(12), 1/30(25), 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/1500, 1/10000, 1/20000, 1/40000 sec
- **IRIS:** Iris level can be set in IRIS.P or MANUAL mode
  - ▶ CLOSE / F1.7 / F1.8 / F2.0 / F2.4 / F2.8 / F3.4 / F4.0 / F4.8 / F5.6 / F6.8 / F8.0 / F9.6 / F11 / F14 / F16
- **DSS:** Select maximum DSS (Digital Slow Shutter)
  - ▶ OFF / 2x / 4x / 8x / 16x / 32x / x64 (※ 60 or 50fps mode)
  - ▶ OFF / 2x / 4x / 8x / 16x / 32x (※ 30 or 25fps mode)

- FLICKERLESS: Select flickerless mode
  - ▶ OFF / ON (remove screen flicker)
- BRIGHTNESS: Adjust brightness level
  - ▶ 0(dark) ~ 14(bright) steps
- BACK LIGHT: Select HLC (High Light compensation) or BLC (Back Light compensation).
  - ▶ OFF
  - ▶ BLC
    - LEVEL: 0 ~ 6 steps
    - POSITION: Adjust the window position
    - SIZE: Adjust the window size
      - ※ BLC doesn't work in Manual Exposure Mode.
  - ▶ HLC

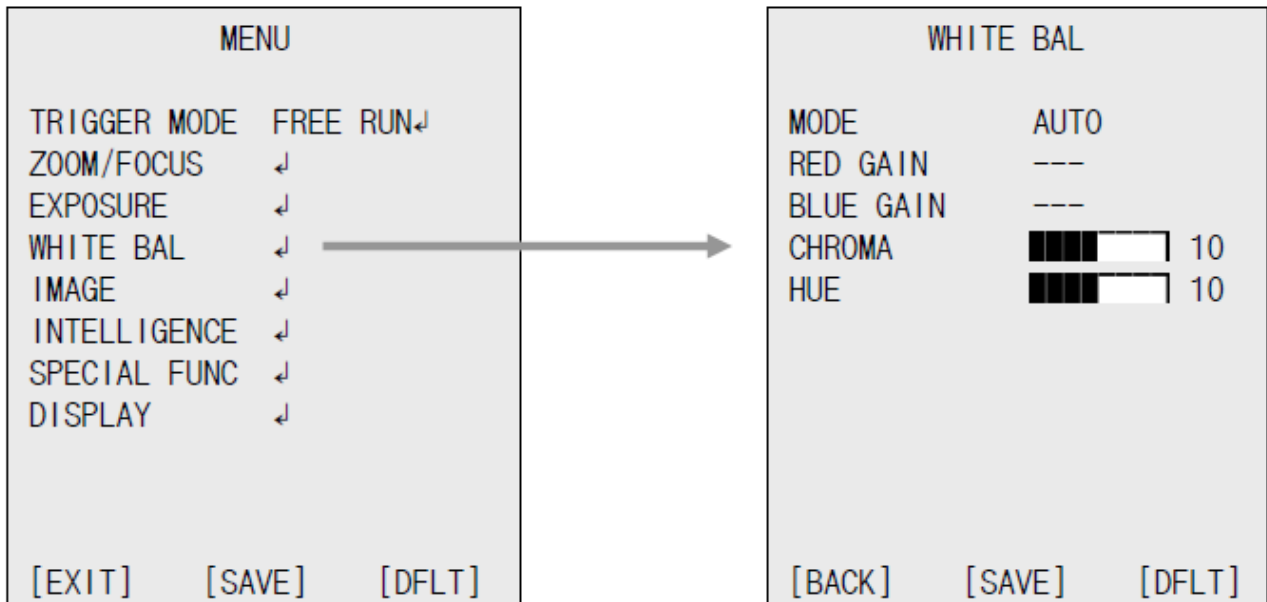
When extremely bright light is projected to the camera masking is used on the portion to prevent partial saturation on the monitor.

    - MODE : ON / NIGHT
    - LEVEL : 0 ~ 20 steps
    - GRAY LEVEL : 0 ~ 10 steps
    - POSITION : Adjust the window position.
    - SIZE : Adjust the window size.
- DAY&NIGHT: Select Day&Night
  - ▶ AUTO
    - DELAY: 0 ~ 255 sec
    - THRS: 0 ~ 28 steps
      - Day↔Night switching level in Auto Mode.
      - Switching in lower lux with lower threshold level.
    - GAP: LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH
      - Margin between Day→Night switching level and Night→Day switching level.
    - IR DETECTION: Setting IR Detection mode. (ON / OFF)
    - IR DET LEVEL: Setting IR Detection level.  
(LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH)
    - BURST: OFF / ON

- ▶ EXT-IN↓ / DAY / NIGHT↓
  - DELAY: 0 ~ 255 sec
  - BURST: OFF / ON
  - POLARITY: External Input polarity (ACTIVE LOW / ACTIVE HIGH)
- ▶ DAY
- ▶ NIGHT↓
  - BURST: OFF / ON
- NIGHT FNC SET: Select whether or not to use the Night State-Only setting.
  - ▶ OFF: Use the same settings as the Day status.
  - ▶ ON↓: Use the Night State-Only setting for the following features.
    - FOCUS MODE : AUTO / ONE PUSH / MANUAL
    - EXPOSURE MODE : AUTO / IRIS.P / SHUT.P / MANUAL
    - AGC : 0 ~ 10
    - SHUT SPEED : 1/1, 1/2, 1/4(3), 1/8(6), 1/15(12), 1/30(25), 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000, 1/40000sec
    - IRIS : CLOSE / F1.7 / F1.8 / F2.0 / F2.4 / F2.8 / F3.4 / F4.0 / F4.8 / F5.6 / F6.8 / F8.0 / F9.6 / F11 / F14 / F16
    - DSS : OFF / 2x / 4x / 8x / 16x / 32x / x64 (※ 60 or 50fps mode), OFF / 2x / 4x / 8x / 16x / 32x (※ 30 or 25fps mode)
    - FLICKERLESS : OFF / ON / AUTO
    - BRIGHTNESS : 0(dark) ~ 14(bright)
    - BACK LIGHT : OFF / BLC / HLC
    - SHARPNESS : 0 ~ 10 steps

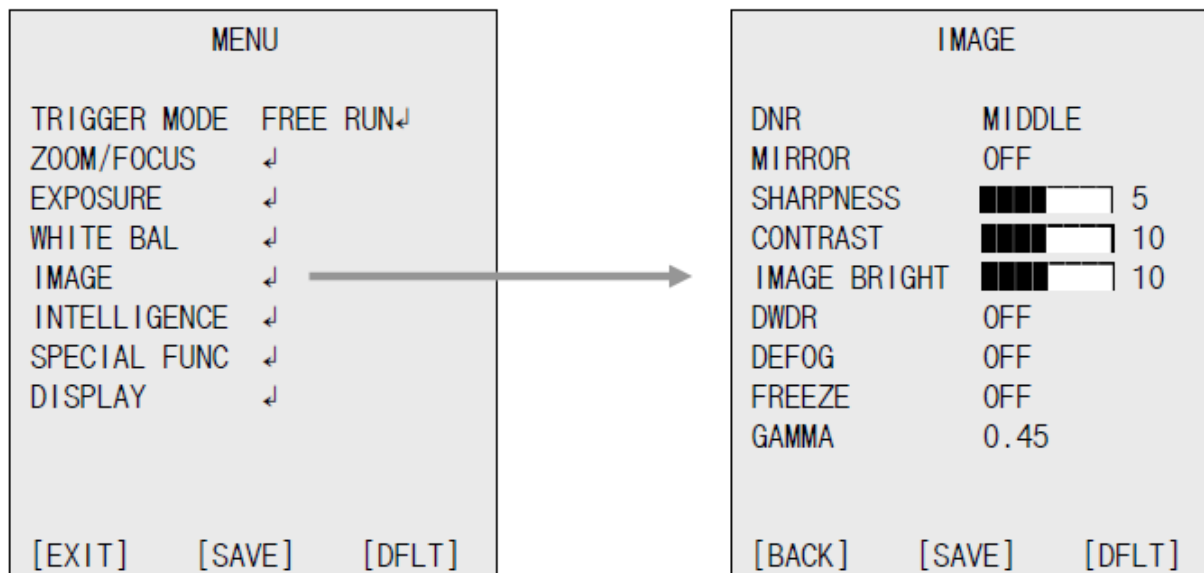
※ If you don't change the setting of NIGHT FNC SET menu, exposure state is automatically set just before switching to the night state.

## ◆ WHITE BALANCE



- MODE: Select WHITE BALANCE mode
  - ▶ AUTO: Automatically adjusts color according to the available lighting.
  - ▶ ONE PUSH: It is a fixed white balance mode that may be automatically readjusted only by pressing ONE PUSH
  - ▶ MANUAL: Color can be corrected when the user increases or decreases “RED GAIN” or “BLUE GAIN”.
  - ▶ INDOOR: Set color temperature to be Indoor light (3700°K)
  - ▶ OUTDOOR: Set color temperature to be Outdoor light (5100°K)
  - ▶ AUTO-EXT: Auto mode operating on a wider range of color temperatures. (<2,000K(Sodium Light) ~ 10,000K)
- RED GAIN: Adjust R gain value
  - ▶ 0 ~ 100 steps
- BLUE GAIN: Adjust B gain value
  - ▶ 0 ~ 100 steps
- CHROMA: Adjust CHROMA gain value
  - ▶ 0 ~ 20 steps
- HUE: Adjust HUE value
  - ▶ 0 ~ 20 steps

## ◆ IMAGE

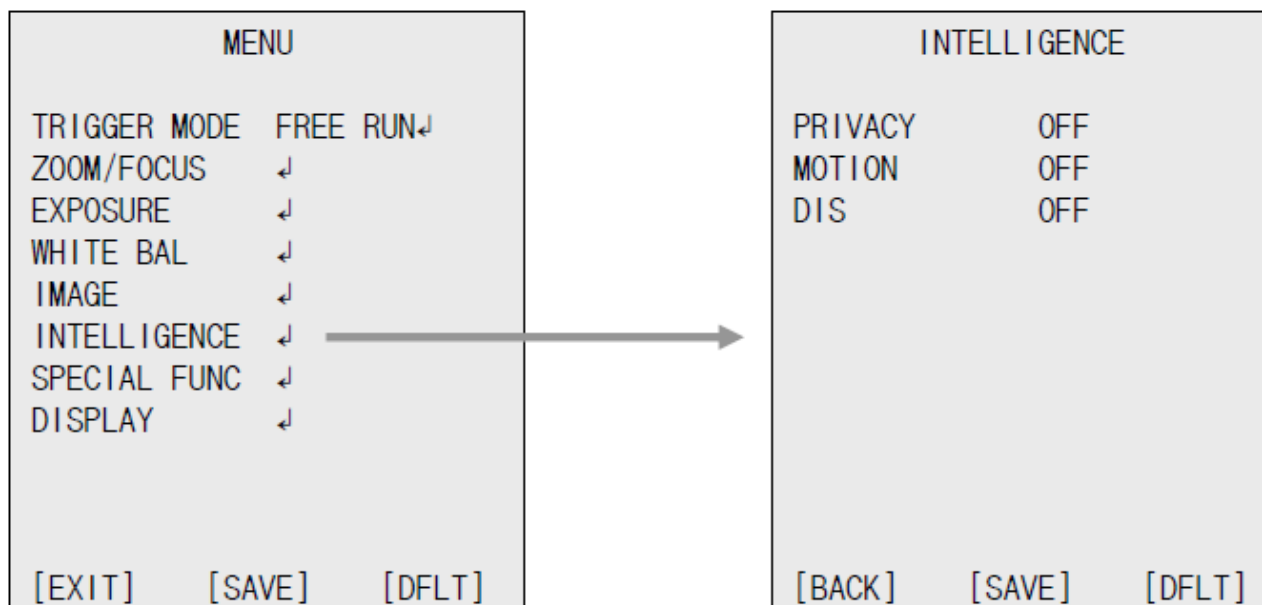


- DNR: Select Digital Noise Reduction
  - ▶ 2D/3D↓
    - 2D-NR : 0 ~ 15 steps
    - 3D-NR : 0 ~ 15 steps
  - ▶ 2D + 3D↓
    - LEVEL: 0 ~ 15 steps
- MIRROR: Select a flip mode
  - ▶ OFF
  - ▶ H: You can flip the picture horizontally on the screen
  - ▶ V: You can flip the picture vertically on the screen
  - ▶ H&V: You can flip the picture horizontally & vertically on the screen
- SHARPNESS: Adjust sharpness level
  - ▶ 0 ~ 10 steps
- CONTRAST: Adjust contrast level
  - ▶ 0 ~ 10 steps
- IMAGE BRIGHT: Adjust image brightness level
  - ▶ 0 ~ 20 steps



- DWDR: Select WDR (Wide Dynamic Range)
  - ▶ OFF
  - ▶ AUTO↓ : Select auto level (HIGH, MIDDLE, LOW)
  - ▶ MANUAL ↓ : Select dark or bright level
    - Dark level: 0 ~ 16
    - Bright level: 0 ~ 16
- DEFOG: Carry out defog function
  - ▶ OFF
  - ▶ AUTO
    - AUTO LEVEL: HEIGH / MIDDLE / LOW
  - ▶ MANUAL
    - LEVEL: 0 ~ 8
- FREEZE: Select real or still mode
  - ▶ OFF / ON
- GAMMA: Select GAMMA
  - ▶ 0.35 / 0.40 / 0.45 / 0.50 / 0.55 / 0.60 / 0.65 / 0.70

## ◆ INTELLIGENCE

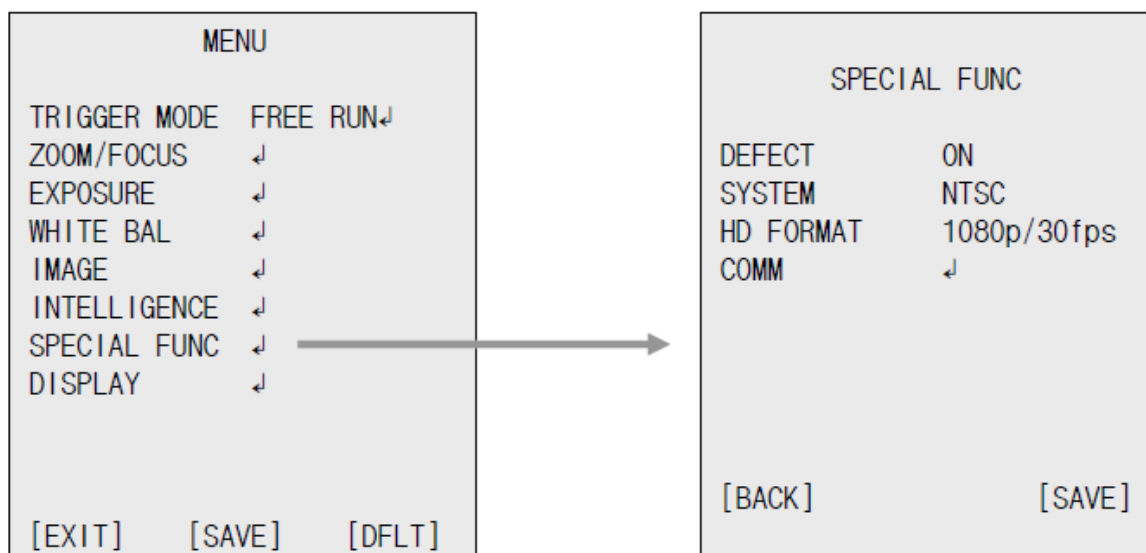


- PRIVACY: Hide an area you want to hide on the screen
  - ▶ OFF
  - ▶ ON↓
    - MASK#: Select mask area number (1 ~ 8)
- ※ Only 4 masks are displayed on the CVBS and the SDI output.
  - MODE: Mask enable or disable (OFF / ON)
  - POSITION: Adjust the mask position
  - SIZE: Adjust the mask size
  - COLOR: Select mask color (0 ~ 13)
- MOTION: When there is movement of the subject in the screen, there will be an motion detection alert.
  - ▶ OFF
  - ▶ ON↓
    - AREA#: Setting 4 areas(1~4) of motion detection.
    - MODE: OFF / ON (Limit and define areas of motion detection)
    - SENSITIVITY: Adjust sensitivity of MD (0 ~ 20 steps)  
More sensitive to setting to low step with sensitivity.
    - POSITION: Adjust the Area position.
    - SIZE: Adjust the Area size.
    - INTERVAL: Select the alarm interval time (0 ~ 255sec).
    - DWELL TIME: Select the duration time about changing MD mode (0 ~ 255sec).
    - ZOOM PRESET: Select Motion Zoom Preset Mode and Position (OFF / ON↓).



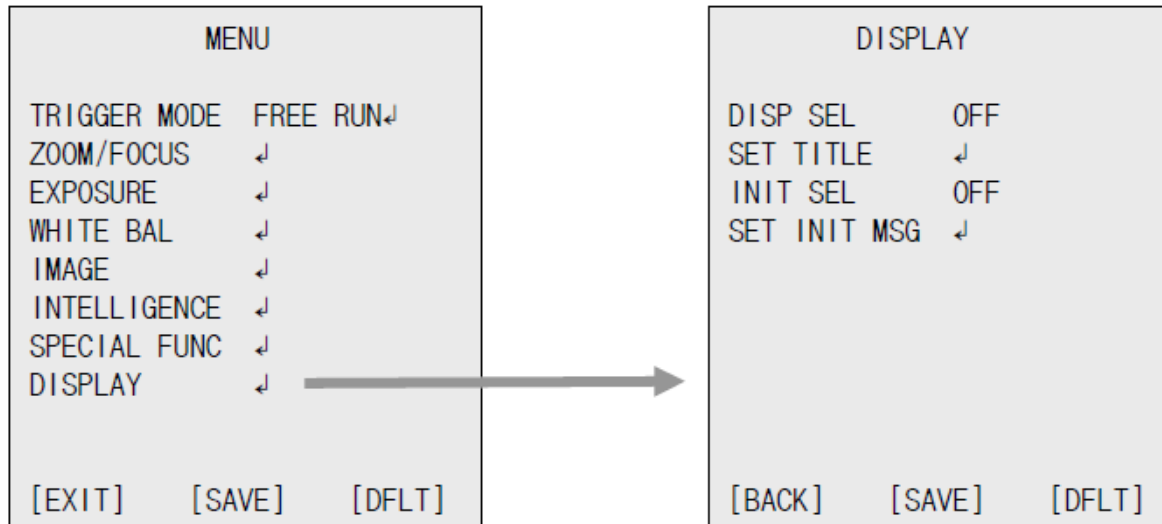
- DIS: Select Digital Image Stabilizer mode
  - ▶ OFF / ON↓
  - ※ When the DIS is turned on, the Digital Zoom is forced / turned off.

## ◆ SPECIAL FUNC



- DEFECT: Select Defect Pixel Compensation mode.
  - ※ Select “OFF↓” and press “Set key” to run bad pixel detection process.
  - ▶ OFF↓ / ON
- SYSTEM: Select system frequency.
  - ▶ NTSC(30/60fps) / PAL(25/50fps)
- HD FORMAT: Select Digital output
  - ▶ 720p/30(25)fps, 1080p/30(25)fps, 1080p/60(50)fps,
- COMM: Set up the camera ID, baud rate, protocol
  - ▶ ID: Select the camera ID (1 ~ 255)
  - ▶ BAUD RATE: 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200bps
  - ▶ PROTOCOL: VISCA / PELCO-D / PELCO-P

## ◆ DISPLAY



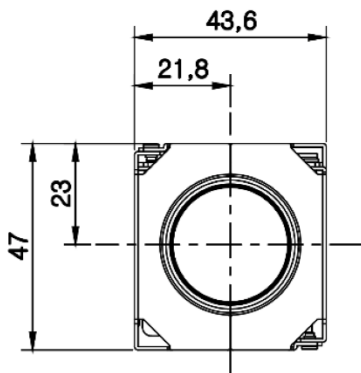
- DISP SEL: Select display item.
  - ▶ OFF / ON↓
    - ID: OFF / ON
    - TITLE: OFF / ON
    - ZOOM RATIO: OFF / ON
    - SYSTEM MSG: OFF / ON (MD Alarm and Wait message)
- SET TITLE: Select camera title menu (Text edit– max 40 characters)
- INIT SEL: Select display initial message.
  - ▶ OFF / ON↓
    - ID: OFF / ON
    - BAUDRATE: OFF / ON
    - PROTOCOL: OFF / ON
    - VERSION: OFF / ON
    - INIT MSG: OFF / ON
- SET INIT MSG: modify initial message. (Text edit – max 40 characters)

### ※ Character Table of Text edit Mode

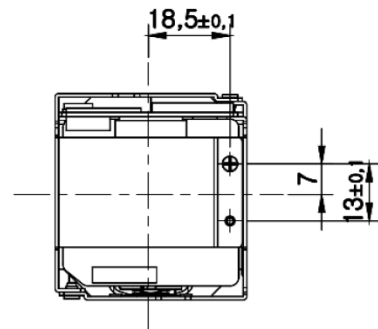
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z  
 a b c d e f g h i j k l m n o p q r s t u v w x y z , .  
 ( ) { } [ ] 0 1 2 3 4 5 6 7 8 9 \* + - / = ~ ! ? " '



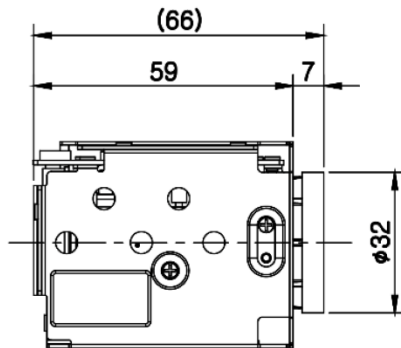
## CAMERA DIMENSIONS



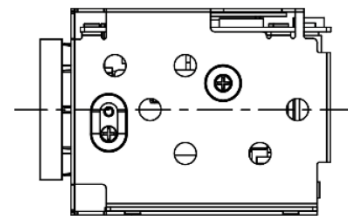
FRONT



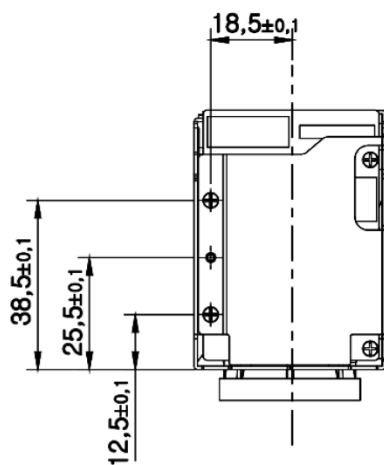
BACK



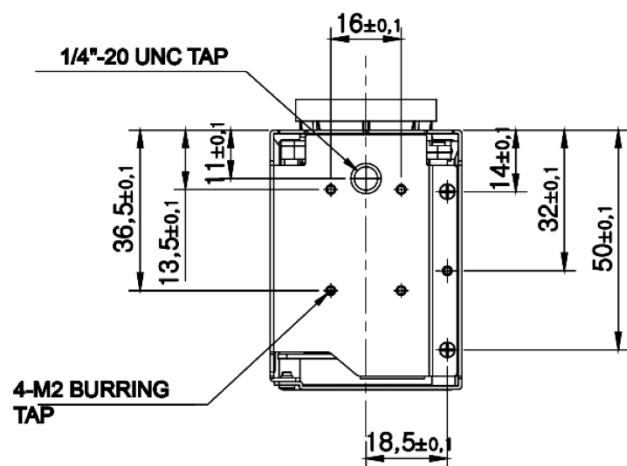
LEFT



RIGHT



TOP



BOTTOM



## APPROVALS

| Active Silicon makes the following approval statements: |                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CE</b>                                               | In accordance with the CE Marking regulations, the <b>Harrier 10x Autofocus-Zoom Global Shutter Camera</b> is not a finished product and is supplied for further integration into a finished product that will be CE marked by the final manufacturer/integrator. Therefore, no CE marking or Declaration of Conformity is required or allowed. |
| <b>RoHS3</b>                                            | This product is compliant with the RoHS3 requirements (Directive 2015/863/EU).                                                                                                                                                                                                                                                                  |
| <b>REACH</b>                                            | Please contact Active Silicon for the latest formal REACH declaration (EC 1907/2006).                                                                                                                                                                                                                                                           |
| <b>EMC</b>                                              | <p>This product is designed to be compliant with the following requirements when housed in a suitable enclosure:</p> <ul style="list-style-type: none"><li>• EN 55022:2010 (Class A) and EN 55024:2010 (EU Directive 2014/30/EU Electromagnetic Compatibility)</li><li>• FCC Rules for Class A digital devices</li></ul>                        |

## ORDERING INFORMATION

| PART NUMBER                        | DESCRIPTION                                                                                                                                                     |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AS-CAM-10LGHD-A</b>             | Harrier 10x AF-Zoom Camera Global Shutter (LVDS)                                                                                                                |
| <b>AS-CIB-USBHDMI-002-10LGHD-A</b> | Harrier 10x AF-Zoom Camera GS with USB/HDMI output                                                                                                              |
| <b>AS-CIB-IP-00x-10LGHD-A</b>      | Harrier 10x AF-Zoom Camera GS with Ethernet IP output.<br>x= variant of the IP camera system<br>1 = no Wi-Fi, no PoE<br>2 = Wi-Fi<br>3 = PoE<br>4 = Wi-Fi + PoE |



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