Active Silicon

# Oriole 3x AF-Zoom HD-SDI Board Camera with Global Shutter

## (HD-SDI/EX-SDI/CVBS)

# AS-BCAM-3SG42-00-A

# Technical Reference Manual

Edition: v1.06

Issued Date: 16 July 2024

# Contents

## Features

◆ **1/1.8" Sony Global Shutter CMOS sensor**
3.21M Pixels(Total) / 2.1M Pixels(Active)

◆ **Full HD Resolution**
1920x1080p / 30fps(25fps)
1920x1080p / 60fps(50fps)
1280x720p / 30fps(25fps)
1280x720p / 60fps(50fps)

◆ **DAY & NIGHT**
This camera supports filter changed day and night function using a DC Motor controller. The filter state can be changed between day and night depending on the luminance level. It can be also controlled by the external Day and Night port.

◆ **DWDR (Digital Wide Dynamic Range)**

◆ **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 mask specific areas of the scene from view.

◆ **On Screen Display**
The camera can be controlled by selecting menu text displayed on the video output.

◆ **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.

◆ **Output**
Digital output: HD-SDI, EX-SDI

◆ **Analogue output: CVBS**

◆ **Protocol**
The camera can be controlled by the VISCA, PELCO-D and PELCO-P serial communications protocols.

◆ **AutoFocus**
The autofocus in this camera does not run continuously; it is has ‘one push/shot’ mode of operation and is only triggered by a Zoom command or a one push/shot command from the OSD Menu.

# Cautions

### ◆ Power Supply

This camera must always be operated at 12V DC

### ◆ Handling of the unit

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

### ◆ 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 °C - 50 °C, however, we recommend that the unit be used within a temperature range of 0 °C - 45 °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 CMOS sensor 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.

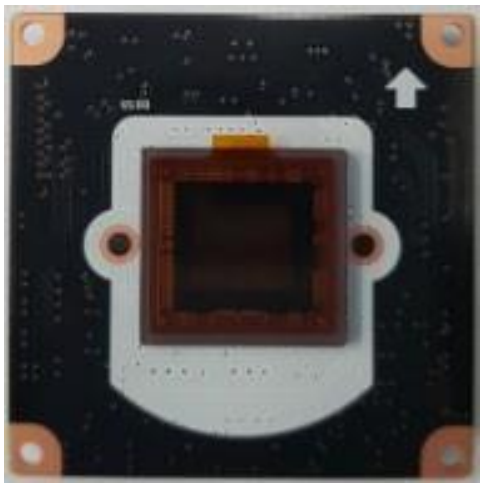
## Specification

| Model | AS-BCAM-3SG42-00-A |
|---|---|
| Image Sensor | 1/1.8" Global Shutter Sony Pregius IMX265LQR CMOS sensor. |
| Total Pixels | 2,064(H) x 1,554(V), 3.21M Pixels |
| Effective pixels | 1,920(H) x 1,080(V), 2.07M Pixels |
| Scanning system | Progressive Scan |
| Shutter Mode | Global Shutter |
| Video modes | Digital: 1080p/60(50)fps, 1080p/30(25)fps, 720p/60(50)fps, 720p/30(25)fps |
| Minimum illumination | Color(1/30s): 0.3lux , BW(1/30s): 0.02lux<br>Color DSS(1/7.5s): 0.075ux , BW DSS(1/7.5s): 0.005lux |
| Video Output | HD: HD-SDI / EX-SDI / BT.1120 / Analog: CVBS (NTSC/PAL) |
| Lens | 3x optical zoom, 12-40mm |
| FOV (Field of View) | Wide to tele: 43.3°-14.3° (D), 33.9°-11.5° (H), 25°-8.6° (V) |
| **Function** | ※ This FOCUS menu only applies to modules with zoom/focus motorized lens. |
| Focus | |
| AF Mode | Auto / Manual |
| Scanning | Half / Full |
| One Shot | On |
| Sync TDN | Off / On |
| Lens Reset | On |
| Refocus | Off / On (Interval Time: 1day – 10 days) |
| Trigger | |
| Trigger Mode | Free Run / External Trigger |
| Trigger Input Polarity | Off / On |
| Strobe Output Polarity | Off / On |
| Strobe Output Mode | Strobe↲ / D&N |
| External Trigger Delay | 0 ~ 255 steps (1step = 1ms) |
| Strobe Delay | 1 ~ 32 steps (30fps): FreeRun Mode, 0 ~ 255 steps: ExtTrig Mode |
| Strobe Width | 1 ~ 33 steps (30fps): FreeRun Mode, 1 ~ 255 steps: Trigger Mode |
| Exposure | |
| Lens | DC / Manual |
| Mode | Auto / Shutter Priority / Manual |
| Gain Control (AGC) | Off / On (Analog 0dB~27dB, Digital 0X~33X) |
| Shutter Speed | Auto / Manual 1/30(1/25) ~ 1/10,000 sec |
| Digital Slow Shutter (DSS) | Off / x2 / x3/ x4/ x5 / x6/ x7/ x8/ x9/ x10/ x12/ x15 |
| Flickerless | Off / On |
| Brightness | 0 ~ 20 steps |
| BLC | Off / On |
| Day&Night | Auto / Day / Night / Ext |

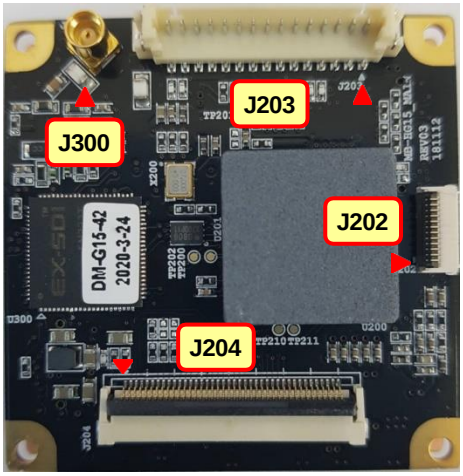
| Model | AS-BCAM-3SG42-00-A |
|---|---|
| White Balance | |
| Mode | Auto / One Push / Manual / Indoor / Outdoor |
| Red Gain | 0 ~ 20 steps |
| Blue Gain | 0 ~ 20 steps |
| Chroma | 0 ~ 20 steps |
| Hue | 0 ~ 20 steps |
| Image | |
| HLC | Off / On (Level 0 ~ 20 steps) |
| DNR | Off / 2D / 3D / 2D+3D (Auto / Low / Mid / High) |
| Mirror | Off / H / V / H&V |
| Sharpness | 0 ~ 10 steps |
| ACE | Off / Manual (Level 0 ~ 11 steps)  (Adaptive Contrast Enhancement) |
| Defog | Off / Manual (Level 0 ~ 11 steps) |
| Freeze | Off / On |
| Gamma | 0.45 / 0.55 / 0.65 / 0.75 |
| Digital Zoom | Off / On (x1 ~ x6) |
| Intelligence | |
| Privacy Mask | Off / On (8 masks) |
| Motion Detection | Off / On (4 positions) |
| DIS | Off / On (Digital Image Stabilizer) |
| Special Function | |
| Lens Shading | Off / On |
| Defect Det. | Off (One Push) / On |
| System | NTSC / PAL |
| HD Format | 1080p/60(50)fps / 1080p/30(25)fps / 720p/30(25)fps / 720p/60(50)fps |
| EX-SDI | Off (HD-SDI) / 270M V1.0 / 135M V2.0 |
| Out Select | SDI/IP, SDI/CVBS, IP/SDI, IP/CVBS |
| Communication / Comm Aux | ID: 1 ~ 255 |
| | Baud Rate: 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200 |
| | Protocol: Pelco-P / Pelco-D / VISCA / WEZ |
| 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 |
| Language | English / Simplified Chinese / Traditional Chinese / Japanese |
| **Electrical** | |
| Power Source | 12V±10% DC |
| Power Consumption | 350mA |
| **General** | |
| Power Input | Header Connector |
| Video Output (HD-SDI) | MMCX Connector |
| Operating Temperature | -10°C ~ +50°C  (Humidity: 0%RH ~ 80%RH) |
| Storage Temperature | -20°C ~ +60°C (Humidity: 0%RH ~ 90%RH) |
| Dimensions (mm) | 78(L) x 51(W) x 51(H) mm (width and height is 2x maximum radius)<br>42(L) x 42(W) x 15(H) mm (2-board module only, without lens/mount) |

| Model | AS-BCAM-3SG42-00-A |
|---|---|
| Weight | 108g |

## Connectors



Top view of top board (without lens)




Bottom view of 2nd (bottom) board


Bottom view side up


Bottom view side left


Bottom view side right

| **J203** (I/O Connector) | | | | | |
|---|---|---|---|---|---|
| **Pin No.** | **Name** | **Level** | **Pin No.** | **Name** | **Level** |
| 1 | DC+12V in | | 9 | TRIG_IN | External Trig signal Input (+3.3V) |
| 2 | GND | | 10 | D/N_IN | Day & Night Control Input (+3.3V normal, 0V) |
| 3 | CVBS | Composite Video | 11 | STROBE_OUT | Strobe signal Output (+3.3V) |
| 4 | TXD | UART (CMOS 3.3V) | 12 | DC+5V | DC+5V Output (max 10mA) |
| 5 | GND | | 13 | GND | |
| 6 | RXD | UART (CMOS 3.3V) | 14 | 485(+) | RS-485 Data+ |
| 7 | ADKEY | OSD Control | 15 | 485(-) | RS-485 Data- |
| 8 | GND | | | | |
| 12505WS-15 (YEONHO) | | | | | |

| **J300** (HD-SDI Connector) | | | | | |
|---|---|---|---|---|---|
| **Pin No.** | **Name** | **Level** | **Pin No.** | **Name** | **Level** |
| 1 | SDO | HD-SDI Output | 2 | GND | |
| RF Connector - MMCX | | | | | |

| **J202** (Connector for upgrading Camera Firmware) | | | | | |
|---|---|---|---|---|---|
| **Pin No.** | **Name** | **Level** | **Pin No.** | **Name** | **Level** |
| 1 | GND | | 7 | GND | |
| 2 | JTCK | JTAG Upgrade Clock Input | 8 | RXD0 | UART (Rxd) Input |
| 3 | JTDO | JTAG Upgrade Data Output | 9 | TXD0 | UART (Txd) Output |
| 4 | GND | | 10 | GND | |
| 5 | JTMS | JTAG Upgrade Chip Selector | 11 | N.C | Non Connection |
| 6 | JTDI | JTAG Upgrade Data Input | 12 | N.C | Non Connection |
| 503480-1200 (Molex) | | | | | |

| **J500** (Auto-Iris Control Connector) | | | | | |
|---|---|---|---|---|---|
| **Pin No.** | **Name** | **Level** | **Pin No.** | **Name** | **Level** |
| 1 | DAMP(+) | DC Iris Damping Motor + | 3 | DRIVE(+) | DC Iris Motor Drive |
| 2 | DAMP(-) | DC Iris Damping Motor - | 4 | GND | |
| 12505WR-04 (YEONHO) | | | | | |

| **J204** (BT.1120 Connector) | | | | | |
|---|---|---|---|---|---|
| **Pin No.** | **Name** | **Level** | **Pin No.** | **Name** | **Level** |
| 1 | GND | | 21 | CO2 | Picture data |
| 2 | GND | | 22 | CO3 | Picture data |
| 3 | PCLK | Pixel clock | 23 | N.C | Non Connection |
| 4 | N.C | Non Connection | 24 | N.C | Non Connection |
| 5 | GND | | 25 | N.C | Non Connection |
| 6 | GND | | 26 | N.C | Non Connection |
| 7 | N.C | Non Connection | 27 | CO4 | Picture data |
| 8 | N.C | Non Connection | 28 | CO5 | Picture data |
| 9 | GND | | 29 | CO6 | Picture data |
| 10 | GND | | 30 | CO7 | Picture data |
| 11 | YO0 | Picture data | 31 | N.C | Non Connection |
| 12 | YO1 | Picture data | 32 | N.C | Non Connection |
| 13 | YO2 | Picture data | 33 | N.C | Non Connection |
| 14 | YO3 | Picture data | 34 | N.C | Non Connection |
| 15 | YO4 | Picture data | 35 | N.C | Non Connection |
| 16 | YO5 | Picture data | 36 | N.C | Non Connection |
| 17 | YO6 | Picture data | 37 | N.C | Non Connection |
| 18 | YO7 | Picture data | 38 | N.C | Non Connection |
| 19 | CO0 | Picture data | 39 | GND | |
| 20 | CO1 | Picture data | 40 | GND | |
| TM0520-0040 (TM Tech) | | | | | |

| **J501** (Day & Night Motor Control Connector) | | | | | |
|---|---|---|---|---|---|
| **Pin No.** | **Name** | **Level** | **Pin No.** | **Name** | **Level** |
| 1 | CONT(+) | Day & Night Motor Drive + Output 4.5/0V, normal: open | 2 | CONT(-) | Day & Night Motor Drive – Output 0/4.5V, normal: open |
| 12505WR-02 (YEONHO) | | | | | |

| **J502** (2-Motor Control Connector) | | | | | |
|---|---|---|---|---|---|
| **Pin No.** | **Name** | **Level** | **Pin No.** | **Name** | **Level** |
| 1 | ZOOM A+ | Motorized Lens Zoom A+ Signal (Out) | 5 | FOCUS B+ | Motorized Lens Focus B+ Signal (Out) |
| 2 | ZOOM A- | Motorized Lens Zoom A- Signal (Out) | 6 | FOCUS B- | Motorized Lens Focus B- Signal (Out) |
| 3 | FOCUS A+ | Motorized Lens Focus A+ Signal (Out) | 7 | ZOOM B+ | Motorized Lens Zoom B+ Signal (Out) |
| 4 | FOCUS A- | Motorized Lens Focus A- Signal (Out) | 8 | ZOOM B- | Motorized Lens Zoom B- Signal (Out) |
| 12505WR-08 (YEONHO) | | | | | |

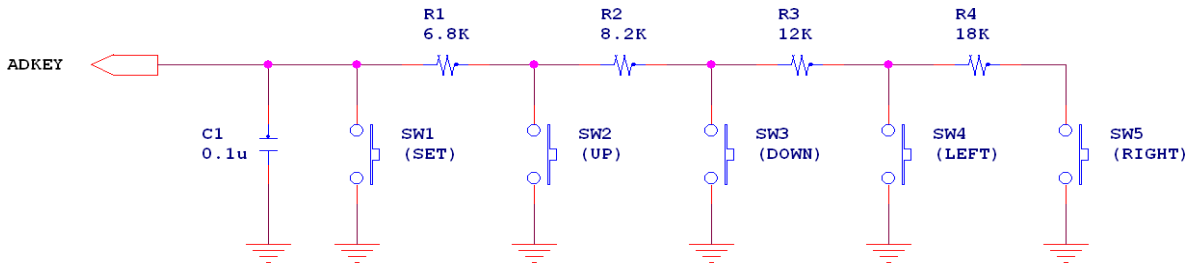
### 1. D&N IN (J203-10)

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

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

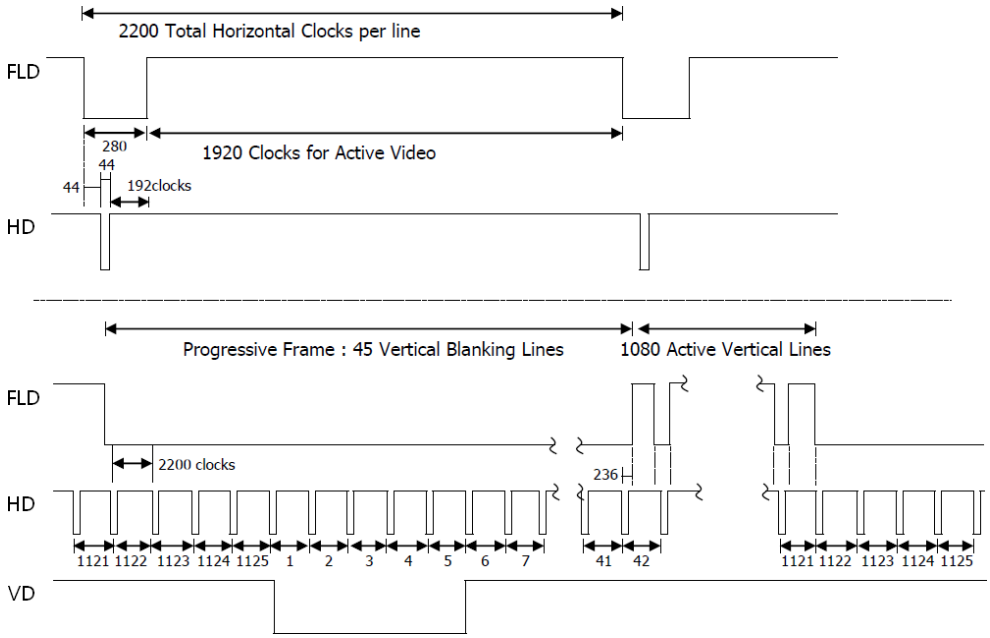
### 2. AD KEY (J201-4)

The external wired remote controller connector.

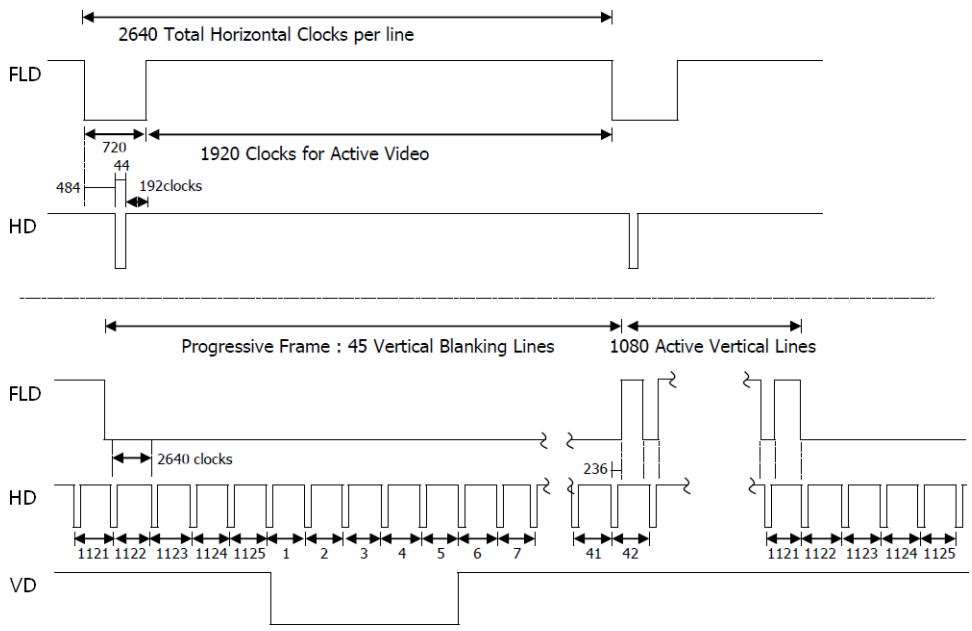


# Timing Chart

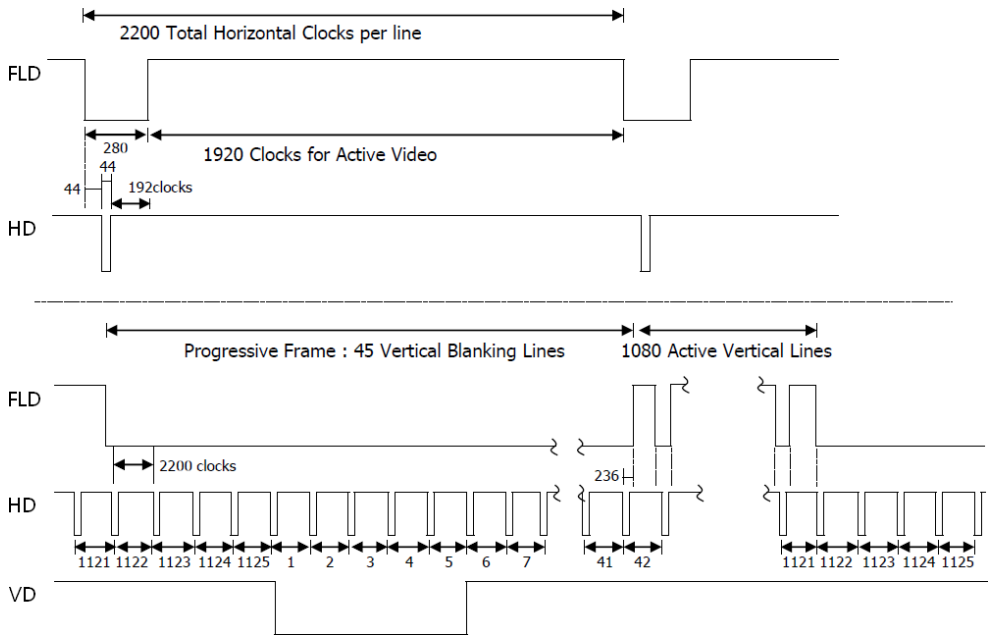
## 1. 1080p/30 Output Timing Chart



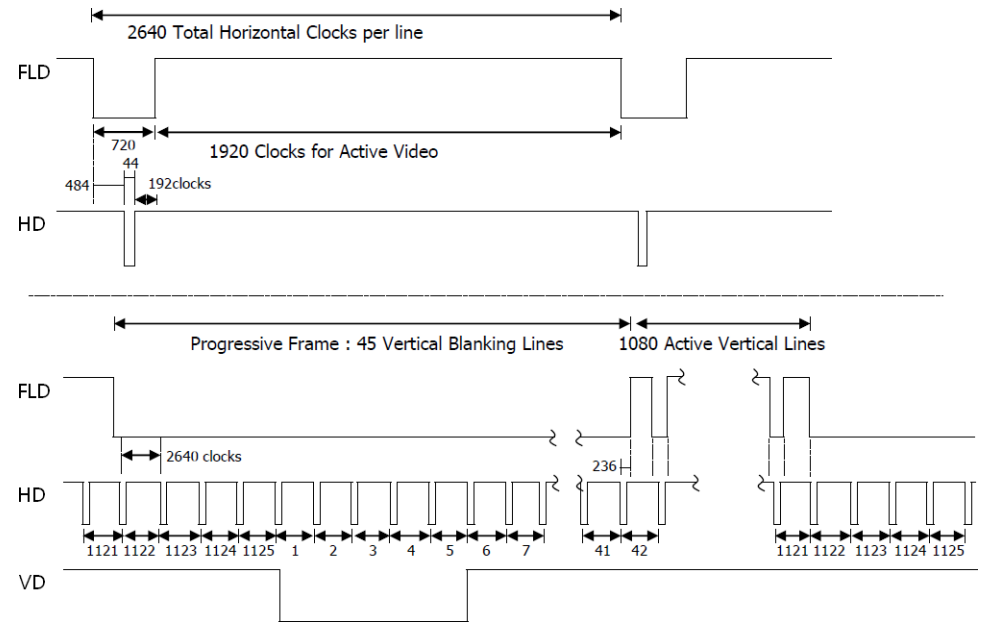

## 2. 1080p/25 Output Timing Chart



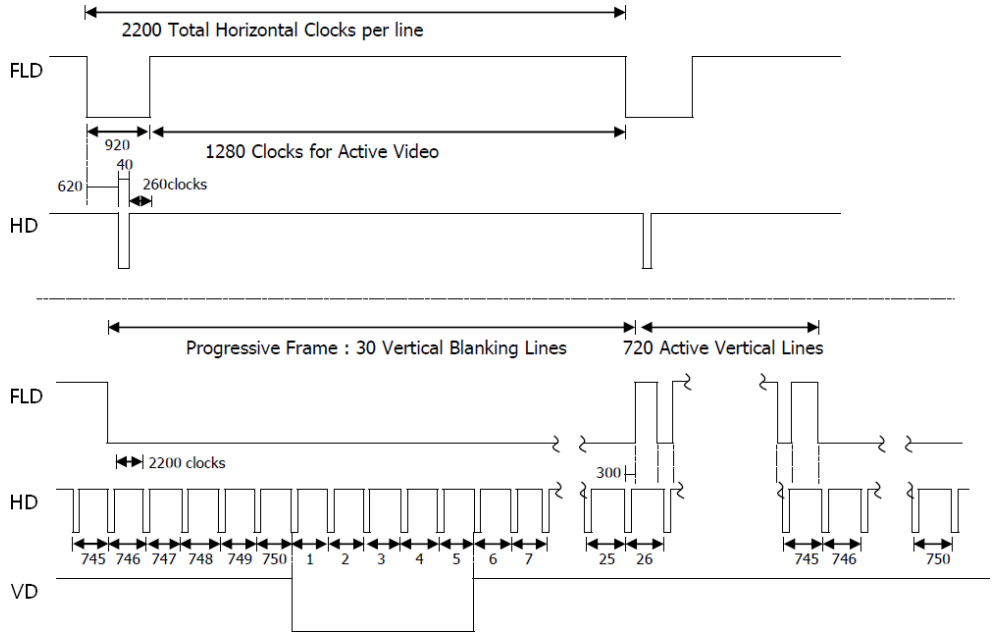
## 3. 1080p/60 Output Timing Chart



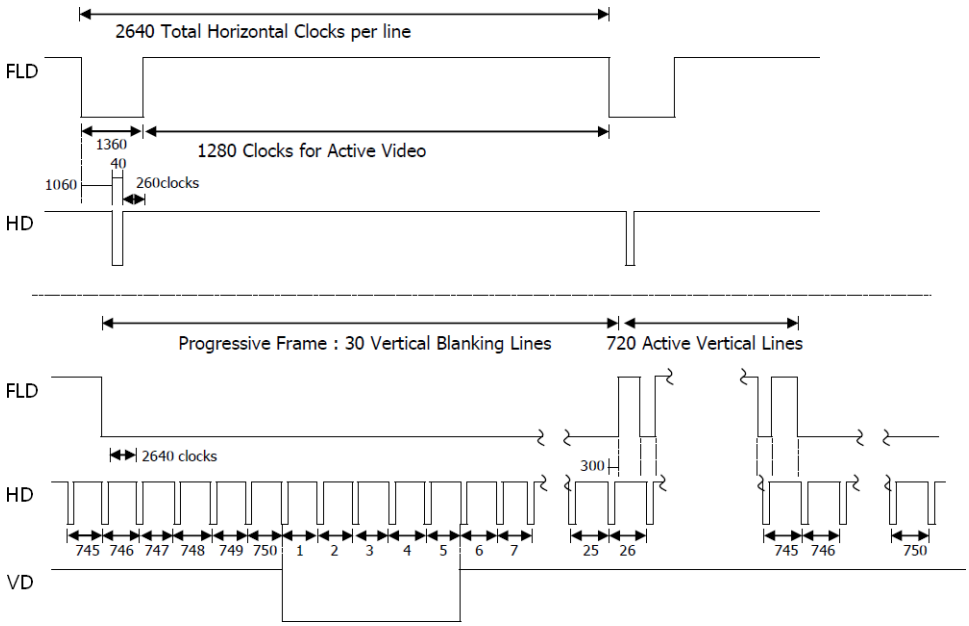

## 4. 1080p/50 Output Timing Chart



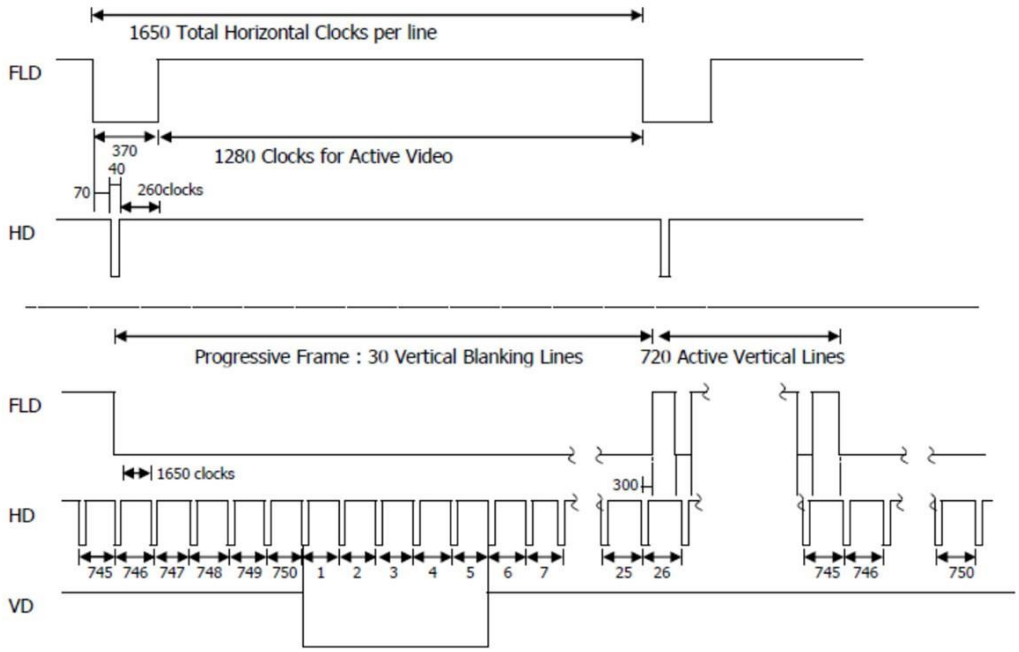
## 5. 720p/30 Output Timing Chart



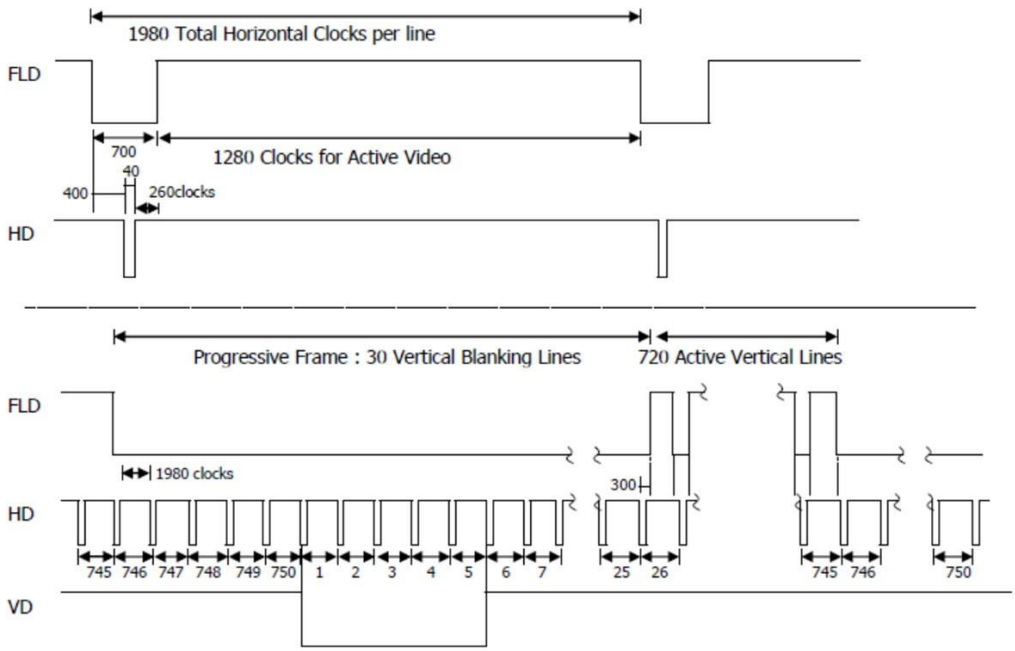

## 6. 720p/25 Output Timing Chart



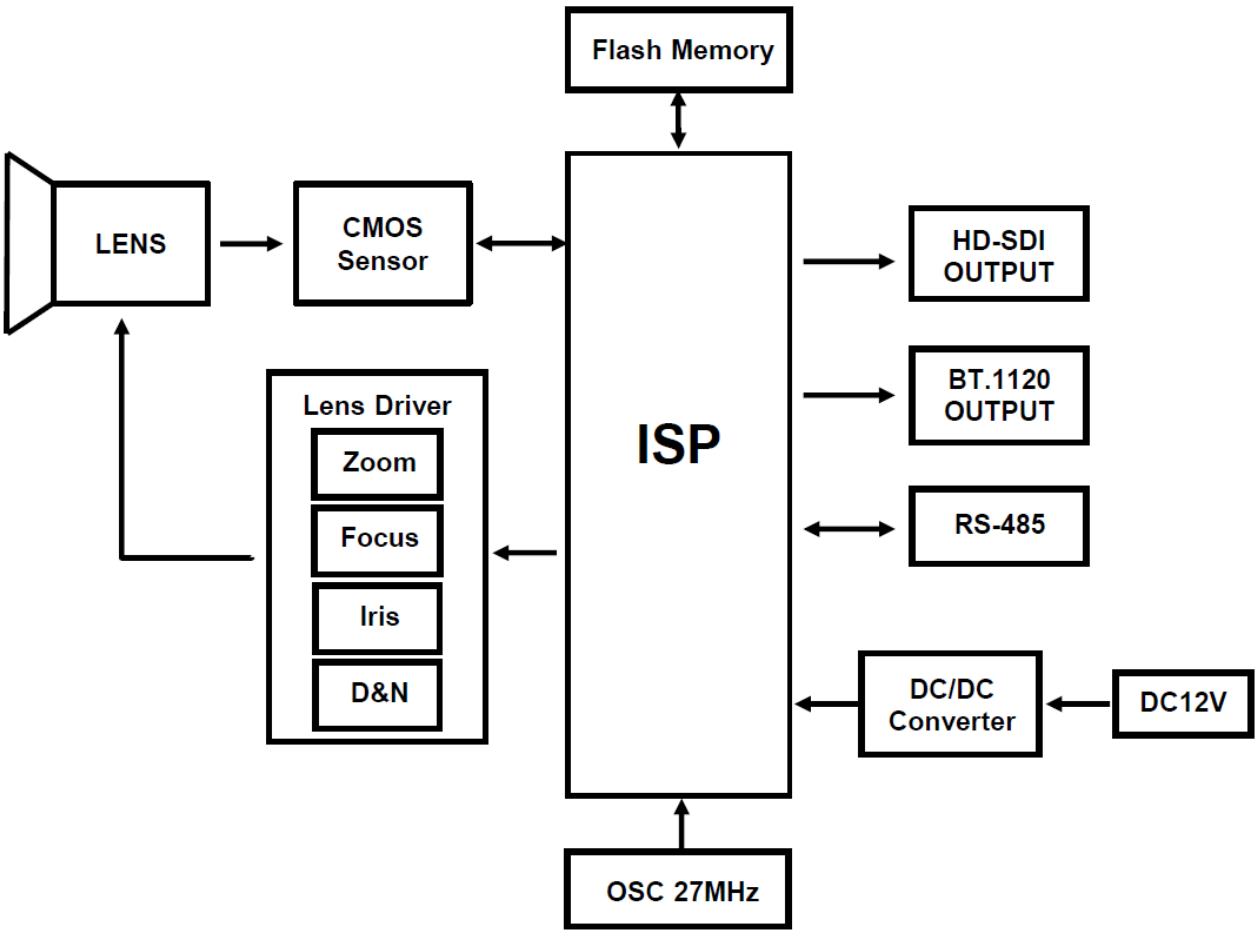
## 7. 720p/60 Output Timing Chart




## 8. 720p/50 Output Timing Chart



## Block Diagram




## AutoFocus

The autofocus in this camera is different to many AF Zoom block cameras, the AF does not run continuously; when the AF mode is set to AUTO it is in a ‘one push/shot’ mode that is only triggered under the following conditions:

1. A Zoom Trigger event (Zoom position is modified by a Tele or Wide command).
2. Operation of a one push/shot command in the OSD Menu (one-push AF operates).

The AF mode can only be set by the OSD menu (see section below), there is no VISCA command to change the AF mode setting.

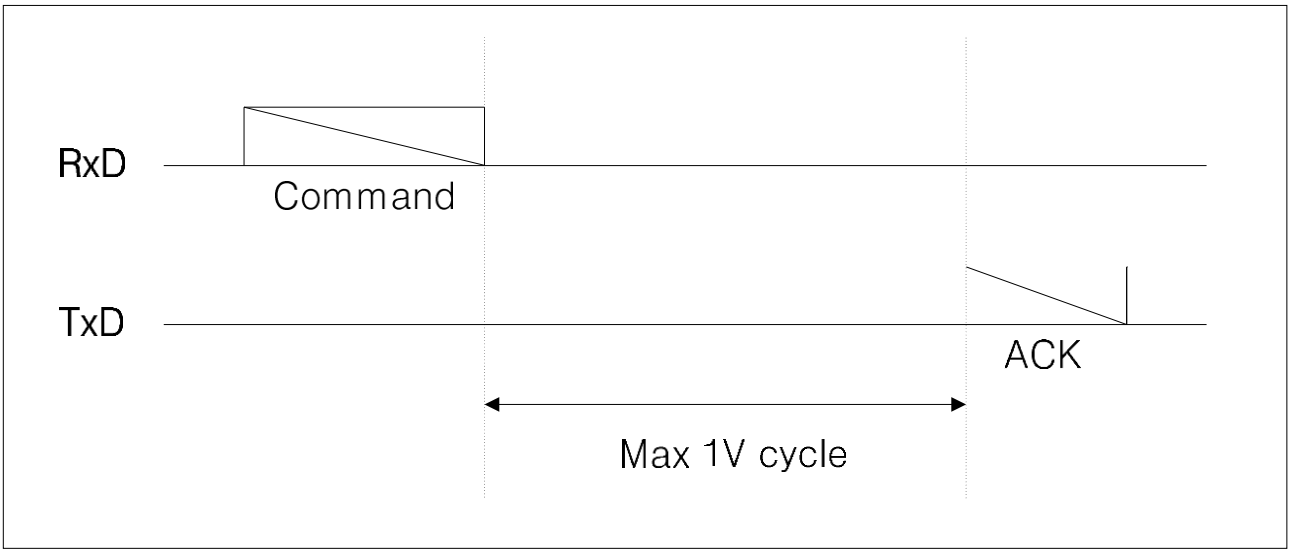
# Protocol

## 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, 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) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Byte1 | Byte2 | Byte3 | Byte4 | Byte5 | Byte6 | Byte7 |
| Zoom Tele | FF | ID | 00 | 20 | 00 | 00 | CS |
| Zoom Wide | FF | ID | 00 | 40 | 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 |

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

### 4. Pelco-P Protocol Command List

| Function | Message format (Hex) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Byte1 | Byte2 | Byte3 | Byte4 | Byte5 | Byte6 | Byte7 | Byte8 |
| Zoom Tele | A0 | ID | 00 | 20 | 00 | 00 | AF | CS |
| Zoom Wide | A0 | ID | 00 | 40 | 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 |

- ID: Camera ID (1 ~ 255)
- 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 | × | × | × |
| | Sender's address | | | | Receiver's address | | |

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

| 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 | | |

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

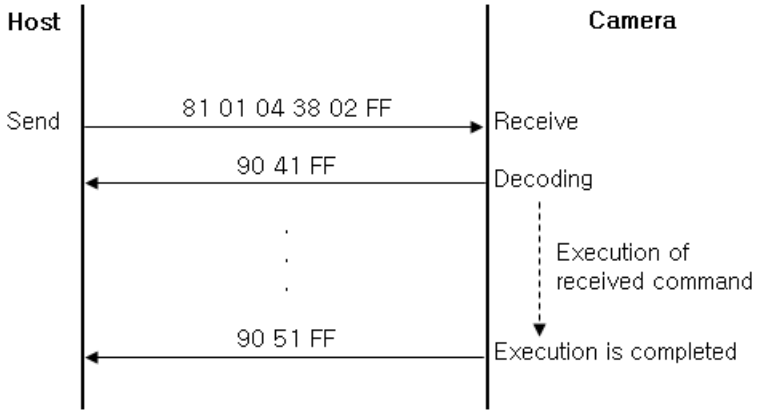
※ When command messages are sent to the camera, it is normal to send the next command message after waiting for the completion message or error message to return. However, to deal with advanced uses, the camera has three buffers (memories) for commands, so that up to three commands including the commands 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 |
|---|---|
| Recevie Ack | Y0 4R FF |
| Compeletion (Commands) | Y0 5R FF |
| Compeletion (Inquiries) | Y0 50 … FF |
| Error | Y0 6R SS FF |

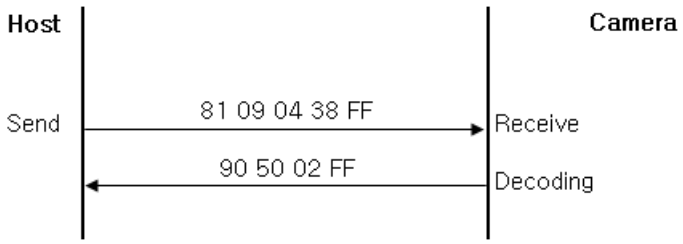
| SS | Description |
|---|---|
| 01 | Message length error |
| 02 | Syntax error |
| 03 | Command buffer full |
| 04 | Command cancelled |
| 05 | No socket (to be cancelled) |
| 41 | Command not executable |

- Example of communication
  - Camera ID: 1
  - Socket number: 1

※ Command




※ Inquiry command




- Network change message
  - 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:

    Y0 38 FF

    – 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 | Zoom Stop | 8x 01 04 07 00 FF | |
| | Tele | 8x 01 04 07 02 FF | |
| | Wide | 8x 01 04 07 03 FF | |
| | Tele (Relative) | 8x 01 04 07 12 pp qq FF | pp qq = 01 00 = 0x0100 = +128 step move |
| | Wide (Relative | 8x 01 04 07 13 pp qq FF | pp qq = 01 00 = 0x0100 = -128 step move |
| | Zoom (Absolute) | 8x 01 04 07 14 pp qq FF | pp qq = 04 00 = 0x0400 = 512 position move |
| CAM_Focus | Focus Stop | 8x 01 04 08 00 FF | Manual focus mode only |
| | Far | 8x 01 04 08 02 FF | |
| | Near | 8x 01 04 08 03 FF | |
| | Far (Relative) | 8x 01 04 08 12 pp qq FF | pp qq = 01 00 = 0x0100 = +128 step move |
| | Near (Relative) | 8x 01 04 08 13 pp qq FF | pp qq = 01 00 = 0x0100 = -128 step move |
| | Focus (Absolute) | 8x 01 04 08 14 pp qq FF | pp qq = 04 00 = 0x0400 = 512 position move |
| CAM_Zoom_Focus (Absolute) | | 8x 01 04 07 15 pp qq rr ss FF | pp qq =Zoom position,<br>rr ss = Focus position<br>e.g. 06 00 0A 00 =<br>Zoom position: 0x600 (768),<br>Focus position: 0x0A00 (1280) |
| CAM_Step_Display | On screen display of zoom/focus values | 8x 01 04 24 31 00 0p FF | p : 2 (On), 0 (Off)<br>CurF = current focus position<br>CurZ = current zoom position |
| CAM_DZoom | On | 8x 01 04 06 02 FF | Digital Zoom ON/OFF |
| | Off | 8x 01 04 06 03 FF | |
| | 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 | |
| | x1/Max | 8x 01 04 06 10 FF | x1/Max Magnification switchover |
| | Direct | 8x 01 04 46 00 00 0p 0q FF | pq : D-Zoom Position |
| CAM_Initialize | Comp Scan | 8x 01 04 19 02 FF | Execute White spot compensation |
| | Comp Scan Thrs | 8x 01 04 19 03 00 0p 0q FF | pq : Threshold of White spot compensation |
| CAM_WB | Auto | 8x 01 04 35 00 FF | Normal Auto |
| | One Push AWB | 8x 01 04 35 03 FF | One Push AWB Mode |
| | Indoor | 8x 01 04 35 01 FF | 3700K Manual Control Mode |
| | Outdoor | 8x 01 04 35 02 FF | 5100K Manual Control Mode |
| | Manual | 8x 01 04 35 05 FF | 8000K Manual Control Mode |
| | One Push Trigger | 8x 01 04 10 05 FF | One Push AWB trigger |
| CAM_Rgain | Reset | 8x 01 04 03 00 FF | R 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(0~14h) |
| CAM_Bgain | Reset | 8x 01 04 04 00 FF | B 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(0~14h) |
| CAM_Chroma | Direct | 8x 01 04 13 00 00 0p 0q FF | pq : Chroma level (0~14h) |

| Command Set | Command | Command Packet | Comments |
|---|---|---|---|
| CAM_LENS | Lens | 8x 01 04 49 00 0q FF | q : Lens Mode<br>(0:Manual 1:DC Iris) |
| | Mode | 8x 01 04 49 01 00 0q FF | q : DC Iris Lens Mode<br>(0:Indoor 1:Outdoor) |
| 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 |
| CAM_AGC | Gain Limit | 8x 01 04 2C 0p FF | AGC Limit (0~10) |
| CAM_SlowShutter | Auto (On) | 8x 01 04 5A 02 FF | Auto Slow Shutter ON/OFF |
| | Manual (Off) | 8x 01 04 5A 03 FF | |
| CAM_MaxDSSLev | Direct | 8x 01 04 5A 1p FF | p :Max Slow shutter level<br>(0:x2, 1:x3, 2:x4, 3:x5, .. 9:x12, 10:x15) |
| CAM_ExpComp | On | 8x 01 04 3E 02 FF | Exposure Compensation ON/OFF |
| | Off | 8x 01 04 3E 03 FF | |
| | Reset | 8x 01 04 0E 00 FF | Exposure Compensation amount setting |
| | 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 ~ 14h) |
| CAM_Flickerless | On | 8x 01 04 7A 02 FF | Flickerless ON/OFF |
| | Off | 8x 01 04 7A 03 FF | |
| CAM_BLC | On | 8x 01 04 33 02 FF | Back Light Compensation |
| | Off | 8x 01 04 33 03 FF | |
| 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 ~ 36h) |
| | Area Start Y | 8x 01 04 3C 20 00 0p 0q FF | pq : Start Vertical Position (0 ~ 3Ch) |
| | Area End X | 8x 01 04 3C 30 00 0p 0q FF | pq : End Horizontal Position (4~3Ah) |
| | Area End Y | 8x 01 04 3C 40 00 0p 0q FF | pq : End Vertical Position (4~40h) |
| CAM_HLC | Mode | 8x 01 04 32 0p FF | p : HLC Mode - 0(Off), 1(On) |
| | Level | 8x 01 04 32 10 00 0p 0q FF | pq : HLC Level (0~14h) |
| | Clip Grey | 8x 01 04 32 3p FF | p : HLC Gray - 0 ~ Ah<br>(0:BLK ~ A:WHITE) |
| CAM_ACE | On | 8x 01 04 1A 02 FF | ACE ON/OFF |
| | Off | 8x 01 04 1A 03 FF | |
| CAM_ACELevel | Direct | 8x 01 04 1A 10 0p FF | p : ACE Level (0 ~ 11) |
| 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 : Defog Level(0 ~ 11) |
| CAM_DNR | Mode | 8x 01 04 53 0p FF | p : 0 (Off), 1 ~ 3 (Manual Level), 4 ( Auto) |
| CAM_GAMMA | Direct | 8x 01 04 5B 0p FF | p: Gamma setting (0~6):<br>(0.3, 0.35, 0.4, 0.45, 0.55, 0.65, 0.75) |
| 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 (0~14h) |
| 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 | |

| Command Set | Command | Command Packet | Comments |
|---|---|---|---|
| CAM_PictureFlip | On | 8x 01 04 66 02 FF | Picture Reverse On/Off (Rotate 180º) |
| | Off | 8x 01 04 66 03 FF | |
| 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 automaticaly by AGC Gain |
| | Ext-In | 8x 01 04 51 05 FF | ICR is changed by external input |
| | Threshold | 8x 01 04 21 00 00 0p 0q FF | pq : Threshold level (0 ~ 14h) |
| | Margin | 8x 01 04 21 10 00 0p 0q FF | pq : Threshold margin (0 ~ 14h) |
| | 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 - 0(0sec) ~ FFh(255sec) |
| | Burst On | 8x 01 04 72 02 FF | Burst On/Off |
| | Burst Off | 8x 01 04 72 03 FF | |
| | IR Detection On | 8x 01 04 6E 02 FF | IR Detection On/Off |
| | 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_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_Stabilizer Func | Range | 8x 01 04 54 00 0p FF | p : DIS Dzoom Range (0:10%, 1:20%, 2:30%) |
| | Filter | 8x 01 04 54 10 0p FF | p : DIS Filter (0:Low, 1:Middle, 2:High) |
| | Auto Center | 8x 01 04 54 20 0p FF | p : Auto centering mode (0:OFF, 1:Half, 2:Full) |
| CAM_MEMORY | Reset | 8x 01 04 3F 00 0p FF | |
| | Set | 8x 01 04 3F 01 0p FF | p : Memory number (0 ~ 8) |
| | 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_DispSel | | 8x 01 04 14 00 0p FF | Display Item : On(1)/Off(0)<br>p : bit[0] - ID, bit[1] - Title,<br>bit[2] - Zoom Position,<br>bit[3] - System Message (MD, Zoom Preset) |
| CAM_MultiLineTitle | Title Set1 | 8x 01 04 73 1L 00 nn 00 00 00 00 00 00 00 00 FF | L : Line Number (0 ~ Eh)<br>nn : H-Position (0 ~ 27h) |
| | Title Set2 | 8x 01 04 73 2L mm nn pp qq 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 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_Use OSD | Display String | 8x 01 05 10 xx yy cc ss "nnnnnnnnnnnnn" FF | xx : X position ( 0 ~ 27h )<br>yy : Y Position ( 0 ~ Eh )<br>cc : Color (Fixed, 07 : White)<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 | Display | 8x 01 04 77 pp pp pp pp FF | Mask Display On/Off<br>pppppppp: Mask Settings (0: OFF, 1: ON) |
| | SetMaskColor | 8x 01 04 78 pp pp pp pp qq rr FF | pppppppp: Mask Color Settings<br>qq: Color Setting when 0 is selected rr : Color Setting when 1 is selected |
| | Non_InterlockMask | 8x 01 04 6F mm 0p 0p 0q 0q 0r 0r 0s 0s FF | mm : Non-Interlock Mask Number<br>pp: X, qq: Y, rr: W, ss: H |
| CAM_KeyLock | Off | 8x 01 04 17 02 FF | Key Lock On/Off |
| | On | 8x 01 04 17 03 FF | |
| CAM_IDWrite | | 8x 01 04 22 0p 0q 0r 0s FF | pqrs: Camera ID（0000 ~ FFFFh) |
| 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 parameter<br>bit[0] : Estimate on/off<br>bit[1] : Mask OSD on/off<br>bit[2] : Text Alarm on/off<br>bit[3] : Signal Output on/off<br>bit[4] : Quick Zoom on/off<br>bit[6] : Tracking on/off<br>bit[7] : Repeat on/off<br>pq: Threshold Level (00 ~ 14h)<br>r: Zoom speed (0 ~ 2) |
| | Window Set | 8x 01 04 1D 0m 0p 0q 0r 0s FF | m: Select Detection Frame Number (0,1,2,3)<br>p: Start Horizontal Position (00 ~ 0Fh)<br>q: Start Vertical Position (00 ~ 08h)<br>r: End Horizontal Size (00 ~ 0Fh)<br>s: End Vertical Size (00 ~ 08h) |
| | Alarm (Reply) | y0 07 04 1B 0p FF | p: Detection Frame Number |
| CAM_RegisterValue | | 8x 01 04 24 mm 0p 0q FF | mm : Register No.<br>(00, 52h, 60h, 72h, 73h, 90h, 91h, 9Ah)<br>pq : Register Value |

## VISCA Inquiry Command List

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|---|---|---|---|
| CAM_DZoomModeInq | 8x 09 04 06 FF | y0 50 02 FF | D-Zoom On |
| | | y0 50 03 FF | D-Zoom Off |
| CAM_DZoomPosInq | 8x 09 04 46 FF | y0 50 00 00 0p 0q FF | pq : D-Zoom Position |
| CAM_CompScanThrsInq | 8x 01 04 19 03 FF | y0 50 00 00 0p 0q FF | pq : White spot compensation Threshold (0~FFh) |
| CAM_WBModeInq | 8x 09 04 35 FF | y0 50 00 FF | Auto |
| | | y0 50 01 FF | One Push AWB |
| | | y0 50 02 FF | 3000K Manual |
| | | y0 50 03 FF | 5000K Manual |
| | | y0 50 05 FF | 8000K Manual |
| CAM_RGainInq | 8x 09 04 43 FF | y0 50 00 00 0p 0q FF | pq : R Gain (0~14h) |
| CAM_BGainInq | 8x 09 04 44 FF | y0 50 00 00 0p 0q FF | pq : B Gain (0~14h) |
| CAM_ChromaInq | 8x 09 04 13 FF | y0 50 00 00 0p 0q FF | pq : Chroma level (0~14h) |
| CAM_LensModeInq | 8x 09 04 49 01 FF | y0 50 00 00 0p 00 FF | p : Lens Mode (0: Indoor) |
| CAM_ShutterPosInq | 8x 09 04 4A FF | y0 50 00 00 0p 0q FF | pq : Shutter Position |
| CAM_SlowShutterModeInq | 8x 09 04 5A FF | y0 50 02 FF | Auto |
| | | y0 50 03 FF | Off |
| CAM_MaxDSSLevInq | 8x 09 04 5A 10 FF | y0 50 0p FF | p :Max Slow shutter level (0:x2, 1:x3, 2:x4, 3:x5, .. 9:x12, 10:x15) |
| CAM_AGCModeInq | 8x 09 04 2C FF | y0 50 0p FF | p : Auto gain limit (0 ~ 10) |
| CAM_ExpCompModeInq | 8x 09 04 3E FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_ExpCompPosInq | 8x 09 04 4E FF | y0 50 00 00 0p 0q FF | pq : ExpComp Position |
| CAM_FlickerlessInq | 8x 09 04 7A FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_BLCModeInq | 8x 09 04 33 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_BLCAreaInq | 8x 09 04 3C 00 FF | y0 50 0p FF | p : BLC Mode – 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 ~ 36h) |
| CAM_BLC_StartYInq | 8x 09 04 3C 20 FF | y0 50 00 00 0p 0q FF | pq : Start Vertical Position (0 ~ 3Ch) |
| CAM_BLC_EndXInq | 8x 09 04 3C 30 FF | y0 50 00 00 0p 0q FF | pq : End Horizontal Position (4~3Ah) |
| CAM_BLC_EndYInq | 8x 09 04 3C 40 FF | y0 50 00 00 0p 0q FF | pq : End Vertical Position (4~40h) |
| CAM_HLCModeInq | 8x 09 04 32 00 FF | y0 50 0p FF | p : HLC Mode - 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 Gray - 0 ~ Ah (0:BLK ~ A:WHITE) |
| CAM_WDModeInq | 8x 09 04 3D FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_WDLevelInq | 8x 09 04 7D FF | y0 50 0p FF | p : WDR Level (0 ~ 4) |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|---|---|---|---|
| CAM_ACEInq | 8x 01 04 1A FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_ACELevelInq | 8x 09 04 1A 10 FF | y0 50 0p FF | p : ACE Level (0 ~ 2) |
| 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 ~ 2) |
| CAM_DNRModeInq | 8x 09 04 53 FF | y0 50 0p FF | p : 0 (Off), 1 ~ 3 (Manual Level), 4 (Auto) |
| CAM_GammaInq | 8x 09 04 5B FF | y0 50 0p FF | p: Gamma setting<br>(0:0.45, 1:0.55, 2:0.65, 3:0.75) |
| CAM_ApertureInq | 8x 09 04 42 FF | y0 50 00 00 0p 0q FF | pq: Aperture Gain (0 ~ 14h) |
| CAM_LR_ReverseModeInq | 8x 09 04 61 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_FreezeModeInq | 8x 09 04 62 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_PictureFlipModeInq | 8x 09 04 66 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_ICRStateInq | 8x 09 04 01 FF | y0 50 02 FF | Night |
| | | y0 50 03 FF | Day |
| CAM_ICRModeInq | 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_ICRThresholdInq | 8x 09 04 21 FF | y0 50 00 00 0p 0q FF | pq : Threshold level (0 ~ 14h) |
| CAM_ICRMaginInq | 8x 09 04 21 10 FF | y0 50 00 00 0p 0q FF | pq : Threshold Margin (0 ~ 14h) |
| 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 -<br>0(0sec)~FFh(255sec) |
| 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_StabilizerModeInq | 8x 09 04 34 FF | y0 05 02 FF | On |
| | | y0 05 03 FF | Off |
| | | y0 05 00 FF | Hold |
| CAM_StabilizerRangeInq | 8x 09 04 54 00 FF | y0 50 0p FF | p : DIS Dzoom Range (0:10%, 1:20%, 2:30%) |
| CAM_StabilizerFilterInq | 8x 09 04 54 10 FF | y0 50 0p FF | p : DIS Filter (0:Low, 1:Middle, 2:High) |
| CAM_StabilizerAutoCInq | 8x 09 04 54 20 FF | y0 50 0p FF | p : Auto centering mode<br>(0:OFF, 1:Half, 2:Full) |
| CAM_MemoryInq | 8x 09 04 3F FF | y0 50 0p FF | p: Last Recall Memory No. |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|---|---|---|---|
| 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)<br>p : bit[0] - ID,<br>bit[1] - Title,<br>bit[2] - Zoom Position,<br>bit[3] - System Message |
| CAM_TitleDisplayModeInq | 8x 09 04 74 FF | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| CAM_MenuModeInq | 8x 09 04 16 FF | y0 50 02 FF | OSD menu On |
| | | y0 50 03 FF | OSD menu Off |
| CAM_BlueScreenModeInq | 8x 09 05 20 FF | y0 50 0p FF | p : Blue Screen Display - 0(Off), 1(On) |
| CAM_MuteModeInq | 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 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 | ppppppppp: Mask Display (0: OFF, 1: ON) |
| CAM_PrivacyColorInq | 8x 09 04 78 FF | y0 50 pp pp pp pp qq rr FF | ppppppppp: Mask Color Setting<br>qq: Color Setting when 0 is selected<br>Rr: Color Setting when 1 is selected |
| CAM_PrivacyMonitorInq | 8x 09 04 6F FF | y0 50 pp pp pp pp FF | ppppppppp : 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_VersionInq | 8x 09 00 02 FF | y0 50 00 20<br>mn pq rs tu vw FF | mnpq: Model Code (0466h)<br>rstu: ROM version (0100h)<br>vw: Socket Number (3) |
| CAM_ModelInq | 8x 09 00 37 FF | y0 50 pp pp pp qq qq FF | pppppp: Model Code<br>*DM-G15-42: YY4D3Ah<br>(YY : Custom. Code, standard model = 00)<br>qqqq : Version |
| CAM_MDModeInq | 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 0s FF | m : Display mode<br>n : Detection parameter<br>bit[0] : Estimate on/off<br>bit[1] : Mask OSD on/off<br>bit[2] : Text Alarm on/off<br>bit[3] : Signal Output on/off<br>bit[4] : Quick Zoom on/off<br>bit[6] : Tracking on/off<br>bit[7] : Repeat on/off<br>pq : Threshold Level (00 ~ 14h)<br>r Zoom Speed (0 ~ 2) |
| 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 ( 00 ~ 0Fh)<br>q : Start Vertical Position (00 ~ 08)<br>r : Stop Horizontal Position (01 ~ 0Fh)<br>s : Stop Vertical Position (01 ~ 08h) |
| CAM_RegisterValueInq | 8x 09 04 24 mm FF | y0 50 0p 0p FF | mm : Register No.<br>(00, 52h, 60h, 72h, 73h, 90h,91h,9Ah)<br>pp : Register Value |

### Exposure control values

#### Shutter Speed (Hex)

| Step (Dec) | NTSC | PAL |
|---|---|---|
| 21 | 1/10000 | 1/10000 |
| 20 | 1/5000 | 1/5000 |
| 19 | 1/2000 | 1/2000 |
| 18 | 1/1000 | 1/1000 |
| 17 | 1/500 | 1/500 |
| 16 | 1/300 | 1/250 |
| 15 | 1/240 | 1/200 |
| 14 | 1/180 | 1/150 |
| 13 | 1/120 | 1/100 |
| 12 | 1/60 | 1/50 |
| 11 | 1/30 | 1/25 |
| 10 | X2 | X2 |
| 9 | X3 | X3 |
| 8 | X4 | X4 |
| 7 | X5 | X5 |
| 6 | X6 | X6 |
| 5 | X7 | X7 |
| 4 | X8 | X8 |
| 3 | X9 | X9 |
| 2 | X10 | X10 |
| 1 | X12 | X12 |
| 0 | X15 | X15 |

### D-Zoom control values

#### D-Zoom: Separate Mode

| Magnification | Zoom Position |
|---|---|
| x1 | 00 |
| x2 | 1E |
| x3 | 28 |
| x4 | 2D |
| x5 | 30 |
| x6 | 32 |

## OSD character values

| | | |
|---|---|---|
| **V position** | 00 ~ 0Eh | 15 Rows |
| **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 | ô |
| 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**

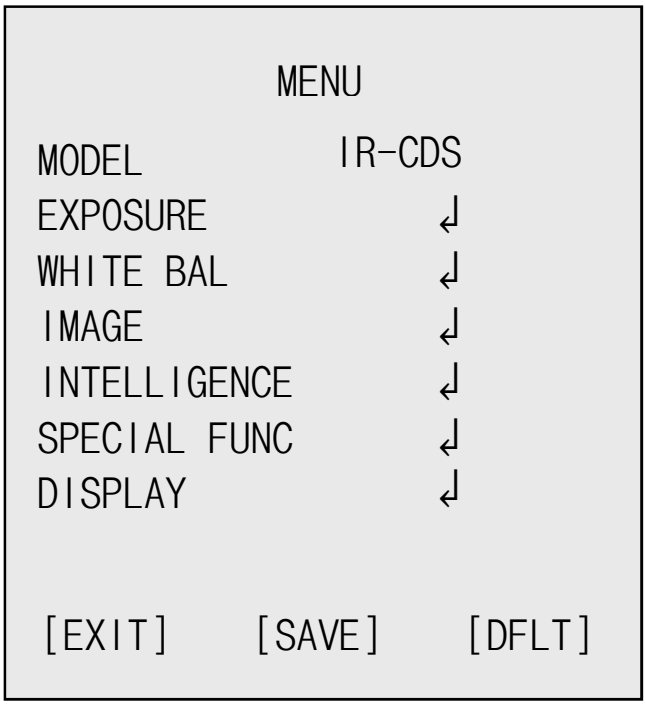
| Function | Register No. | Register Value | Setting |
|---|---|---|---|
| BaudRate | 00 | 10 | 2400 bps |
| | | 11 | 4800 bps |
| | | 00 | 9600 bps |
| | | 01 | 19200 bps |
| | | 02 | 38400 bps |
| | | 03 | 57600 bps |
| | | 04 | 115200 bps |
| Digital ZOOM Max | 52 | 00 ~ F8 | Max. DZoom Ratio = 256 / (256 - Value) |
| Language | 60 | 00 | English |
| | | 01 | Japanese |
| | | 03 | Simplified Chinese |
| | | 05 | Traditional Chinese |
| Monitoring Mode | 72 | 06 | 1080p/30fps |
| | | 08 | 1080p/25fps |
| | | 09 | 720p/60fps |
| | | 0C | 720p/50fps |
| | | 0E | |
| | | 11 | |
| | | 13 | 1080p/60fps |
| | | 14 | 1080p/50fps |
| | | 15 | |
| | | 16 | |
| | | 17 | |
| | | 18 | |
| EX-SDI mode | 9A | 0 | Off |
| | | 1 | On (270M 1.0) |
| | | 2 | On (135M 2.0) |

**Other Control Values**

| Setting | Value Range |
|---|---|
| R Gain | 00 ~ 14h |
| B Gain | 00 ~ 14h |
| Aperture Level | 00 ~ 0Ah |
| Threshold Level of ICR | 00 ~ 1Ch |
| Gap Level of ICR | 00 ~ 04h |

OSD Menu

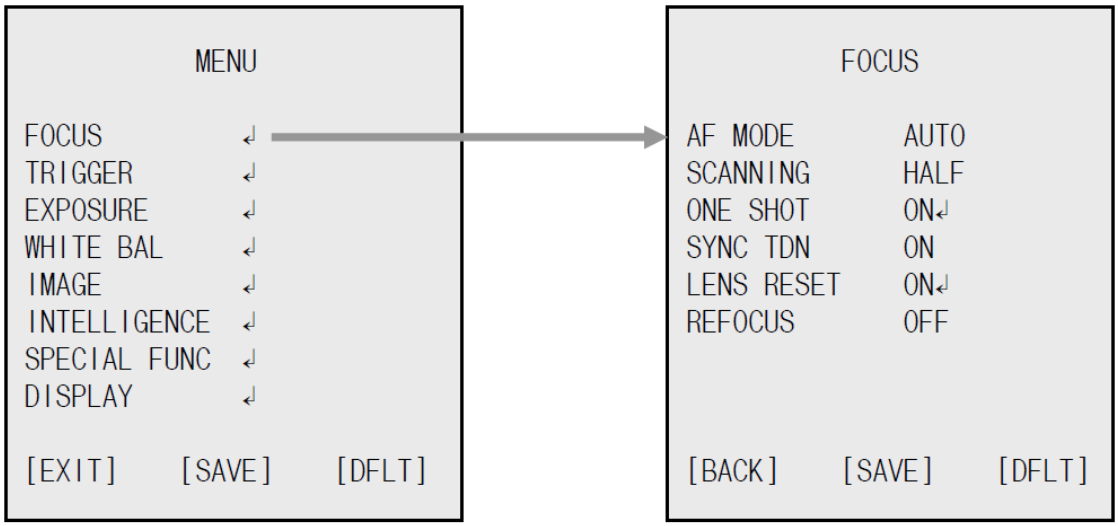
### ◆ MAIN MENU




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 7 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]

## ◆ FOCUS




※ This 'FOCUS' menu only applies to modules with zoom/focus motorized lens.

◈ AF MODE : Select auto focus mode

▶ AUTO, MANUAL

◈ SCANNING : Select focus scan range

▶ HALF, FULL

◈ ONE SHOT : Select readjust focus

▶ ON : Pressing the [**SET**] button more than 3 seconds activates the One-push Auto Focus.

◈ SYNC TDN : Select the One-shot AF when the switch TDN

▶ OFF, ON

◈ LENS RESET : Lens origin calibrated automatically

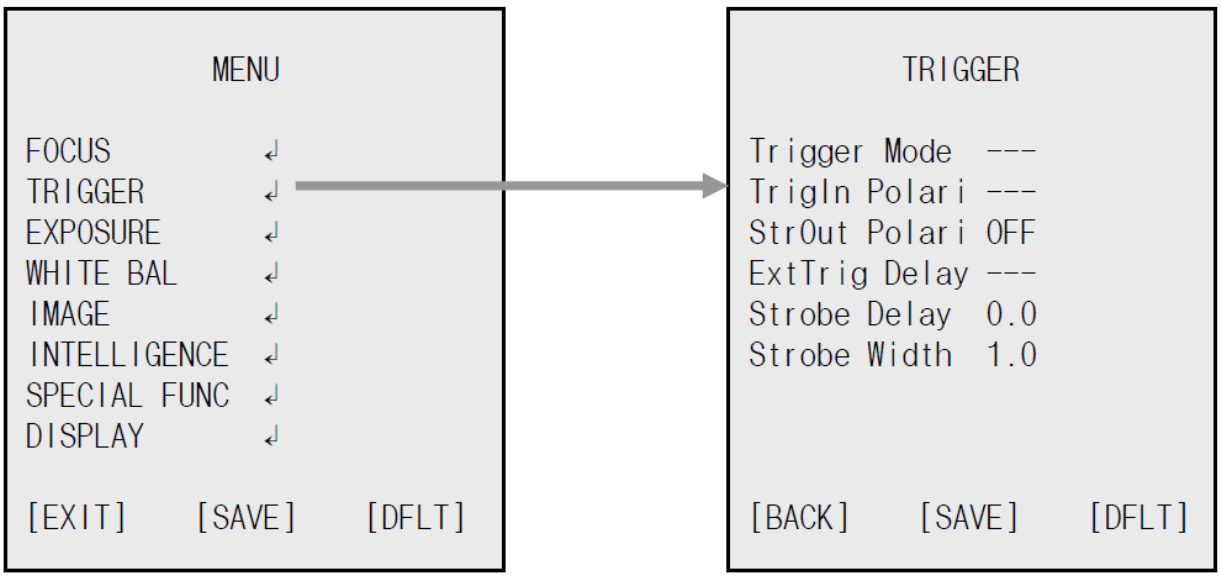
▶ ON : Pressing the [**SET**] button more than 3 seconds activates the Lens initialization.

◈ REFOCUS : select the refocus interval time

▶ OFF, ON↲

▷ INTERVAL TIME : 1day ~ 10days

## ◆ TRIGGER




※ This 'TRIGGER' menu should set the 'MODE' of the 'EXPOSURE' menu to 'MANUAL'

◈ Trigger Mode : Select trigger mode
- ▶ FreeRun / ExtTrig
  - ▷ FreeRun : Continuous image output mode
  - ▷ ExtTrig : External trigger synchronous image output mode

◈ TrigIn Polari : Trigger Input Polarity
- ▶ OFF / ON

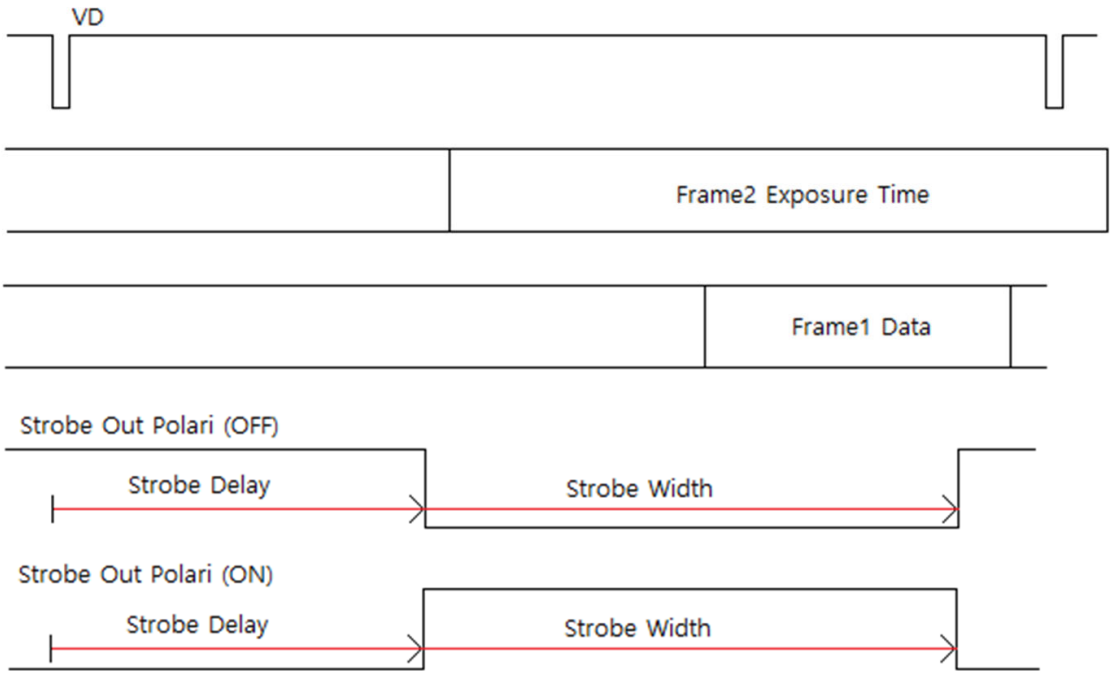
◈ StrOut Polari : Strobe Output Polarity
- ▶ OFF / ON

◈ ExtTrig Delay : External Trigger Delay
- ▶ 0 ~ 255 steps
  - ▷ 1step = 1ms

◈ Strobe Delay : Strobe Output Delay
- ▶ 1 ~ 32 steps : FreeRun Mode (@ 30fps)
  - ▷ 1step = 1ms
- ▶ 0 ~ 255 steps : Trigger Mode
  - ▷ 1step = 1ms

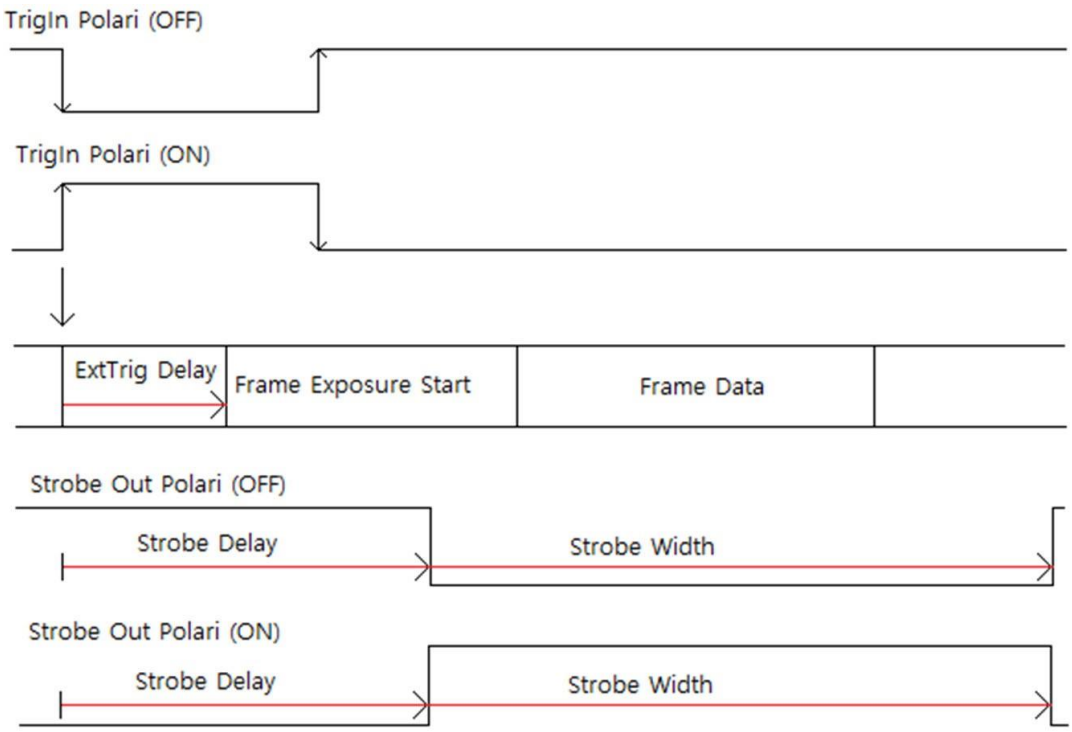
◈ Strobe Width : Strobe Output Width
- ▶ 1 ~ 33 steps : FreeRun Mode (@ 30fps)
  - ▷ 1step = 1ms
- ▶ 1 ~ 255 steps : Trigger Mode
  - ▷ 1step = 1ms

※ Timing Chart : FreeRun Mode




<FreeRun Mode>

※ Timing Chart : Ext. Trig Mode

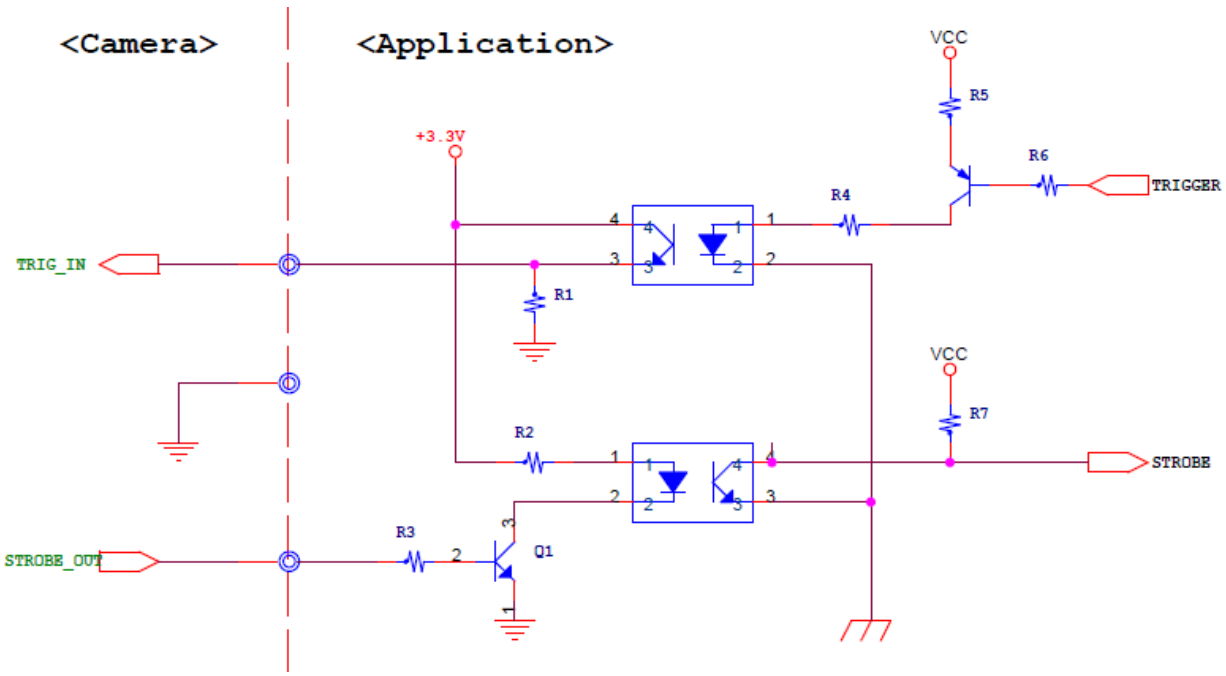



<ExTrig Mode>

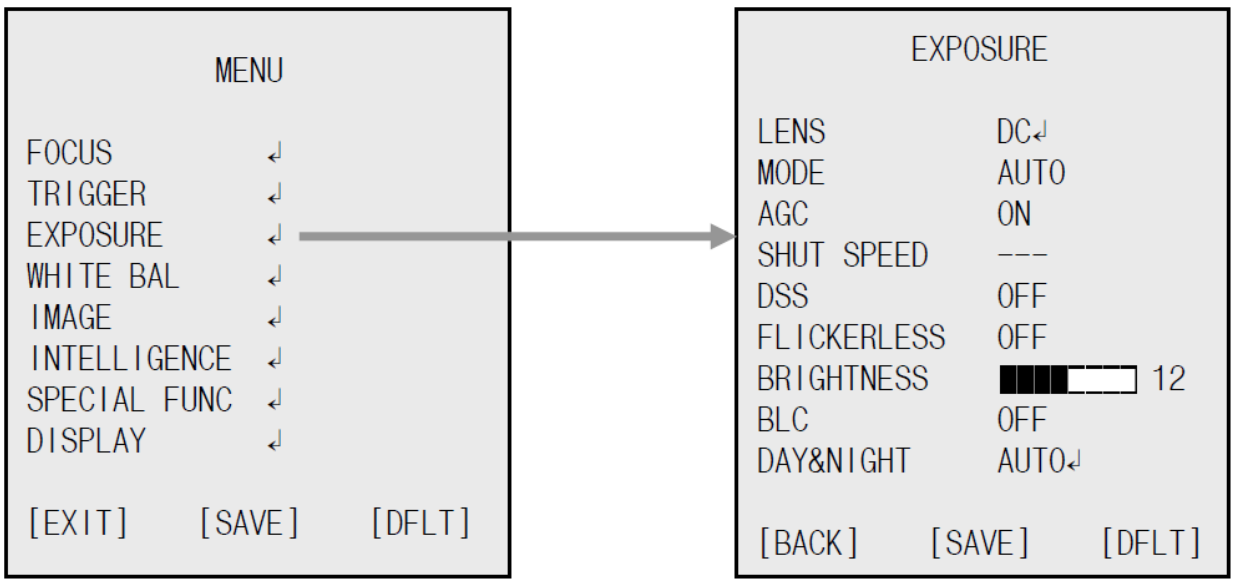
※ Electrical interface : Trigger and Strobe

► 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 flash light 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.



## ◆ EXPOSURE




◈ LENS : Select LENS type
- ▶ DC / MANUAL
  - ▷ DC lens mode : Include IRIS
  - ▷ Manual lens mode : Except IRIS

◈ MODE : Select AE type
- ▶ AUTO / SHUTTER.PRIORITY / MANUAL

◈ AGC : Select Auto Gain Control
- ▶ OFF / ON
  - ▷ Manual Gain
    Analog gain : 0dB, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 27dB
    Digital gain : d3X,5,7,9,11,13,15,17,19,21,23,25,27,29,31,d33X

◈ SHUT SPEED : Can be set in SHUT.P or MANUAL
- ▶ SHUT.P / MANUAL
  - ▷ Manual Shutter Speed
    * 30 / 25 fps mode
    : 1/30(25), 1/60(50), 1/120(100), 1/180(150), 1/240(200), 1/300(250), 1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec

◈ DSS : Select maximum DSS(Digital Slow Shutter)
* 30 / 25 fps mode
- ▶ OFF / x2, x3, x4, x5, x6, x7, x8, x9, x10, x12, x15

◈ FLICKERLESS : Select Flickerless mode

▶ OFF / ON (remove screen flicker)

◈ BRIGHTNESS : Adjust brightness level

▶ 0(dark) ~ 20(bright) steps

◈ BLC : Select BLC(Back Light compensation)

▶ BLC↲

▷ POSITION : Adjust the window position

▷ SIZE : Adjust the window size

※ Can't use MD&PM, HLC and BLC at the same time.

(When MD&PM, HLC On, BLC is Off. And when BLC is On, others is Off)

◈ DAY&NIGHT : Select Day&Night

▶ MODE : AUTO↲/ EXT-IN↲/ DAY / NIGHT↲

▷ AUTO

※ When using AUTO↲mode of D&N and COLOR model

▶ DELAY : 0 ~ 255 sec

▶ THRS : 0 ~ 28

Day↔Night switching level in Auto Mode.
Switching in lower lux with higher threshold level.

▶ GAP : LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH

Margin between Day→Night switching level and
Night→Day switching level.

▶ BURST: OFF / ON

▶ IR-CUT FILTER OFF: OFF / ON

▷ EXT-IN / AUTO

▶ DELAY : 0 ~ 255 sec

▶ BURST : OFF / ON

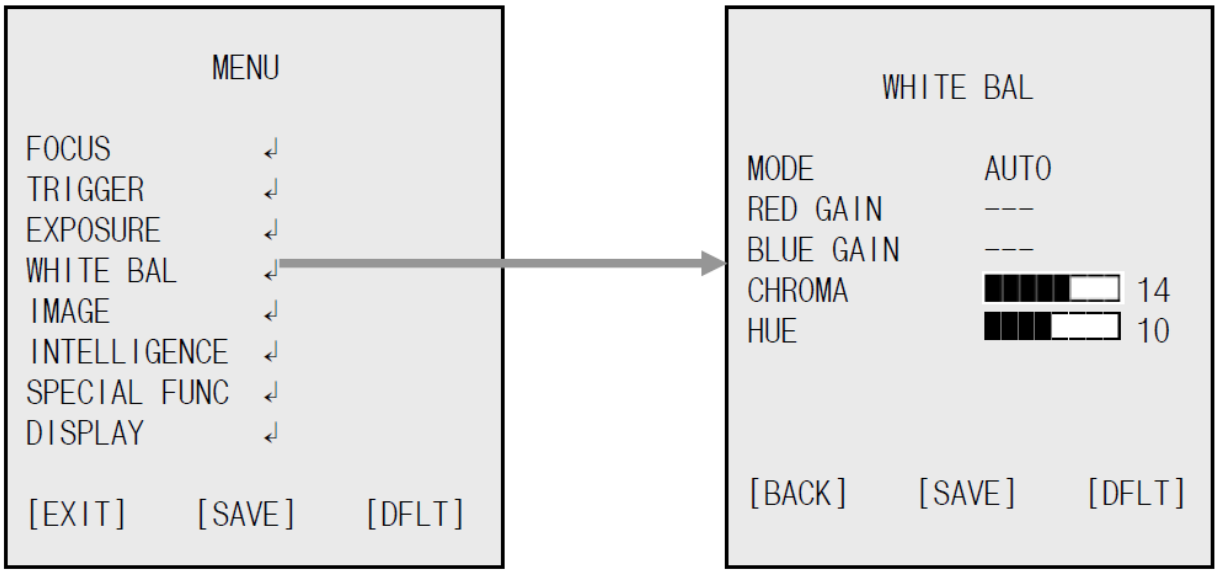
▶ POLARITY : External Input polarity (ACTIVE LOW / ACTIVE HIGH)

▷ NIGHT

▶ BURST : OFF / ON

| Differently configurable OSD Menu Items at Day & Night | |
|---|---|
| TRIGGER | Strobe |
| EXPOSURE | MODE |
| EXPOSURE | AGC |
| EXPOSURE | SHUT SPEED |
| IMAGE | SHARPNESS |

## ◆ WHITE BALANCE




◈ AWB : Select WHITE BALANCE mode

▶ AUTO / ONE PUSH↲ / MANUAL / INDOOR / OUTDOOR

▷ 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)

◈ RED GAIN : Adjust R gain value

▶ 0 ~ 20 steps

◈ BLUE GAIN : Adjust B gain value

▶ 0 ~ 20 steps

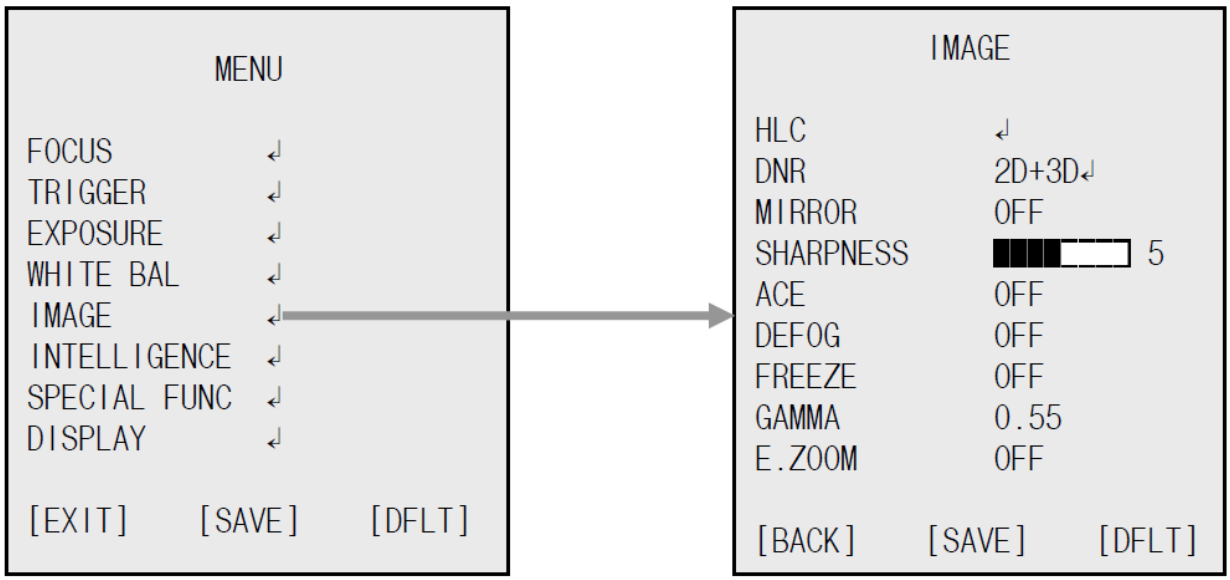
◈ CHROMA : Adjust CHROMA gain value

▶ 0 ~ 20 steps

◈ HUE : Adjust HUE gain value

▶ 0 ~ 20 steps

## ◆ IMAGE




◈ HLC : Select High Light Compensation.
When extremely bright light is projected to the camera masking is used on the portion to prevent partial saturation on the monitor.

- ▶ MODE : OFF / ON
- ▶ LEVEL : 0 ~ 20 steps
- ▶ POSITION : Adjust the window position
- ▶ SIZE : Adjust the window size
- ▶ GRAY LEVEL : 0 ~ 10 steps

※ Can't use MD&PM, HLC and BLC at the same time.
(When MD&PM, HLC On, BLC is Off. And when BLC is On, others is Off)

◈ DNR : Select Digital Noise Reduction

- ▶ OFF / 2D / 3D / 2D+3D
  - ▷ LEVEL : AUTO / LOW / MIDDLE/ HIGH

◈ MIRROR : Select a flip mode

- ▶ OFF / H / V / H&V
  - ▷ 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

◈ ACE : Select Digital WDR (Wide Dynamic Range)

- ▶ OFF / MANUAL↲
  - ▷ LEVEL : 0 ~ 11 steps

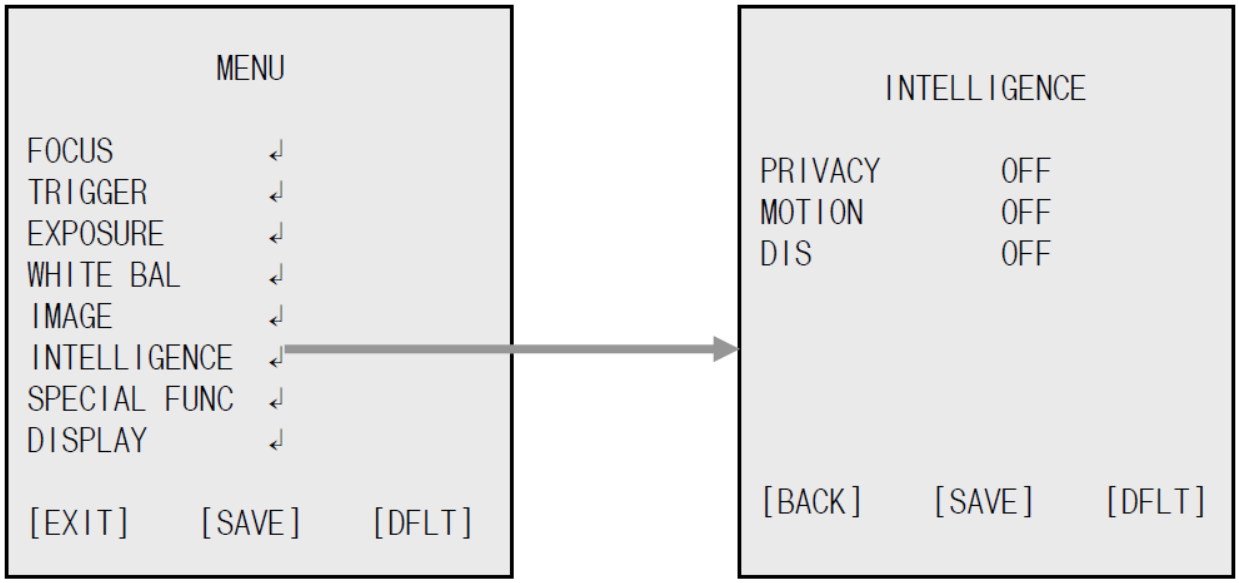
◈ DEFOG: Carry out defog function
- ▶ OFF / MANUAL↲
  - ▷ LEVEL: 0 ~ 11 steps

◈ FREEZE: Select real or still mode
- ▶ OFF / ON

◈ GAMMA: Select GAMMA
- ▶ 0.45 / 0.55 / 0.65 / 0.75

◈ E.ZOOM (Digital zoom)
- ▶ OFF / ON↲
  - ▷ LIMIT: Max x1.0 ~ x6.0
  - ▷ POSITION: Select digital zoom magnification.

## ◆ INTELLIGENCE




◈ PRIVACY: Hide an area you want to hide on the screen

▶ OFF / ON↲

▷ MASK#: Select mask area number (1 ~ 8)

▷ MODE: Mask enable or disable (OFF / ON)

▷ POSITION: Adjust the mask position

▷ SIZE: Adjust the mask size

▷ COLOR: Select mask color (0 ~ 14)

◈ MOTION: When there is movement of the subject in the screen, there will be an motion detection

▶ OFF / ON↲

▷ AREA#: Setting 4 areas(1~4) of motion detection

▷ MODE: OFF / ON (Limit and define areas of motion detection)

▷ AREA DISPLAY: OFF / ON (Event areas of motion detection)

▷ POSITION: Adjust the Area position

▷ SIZE: Adjust the Area size

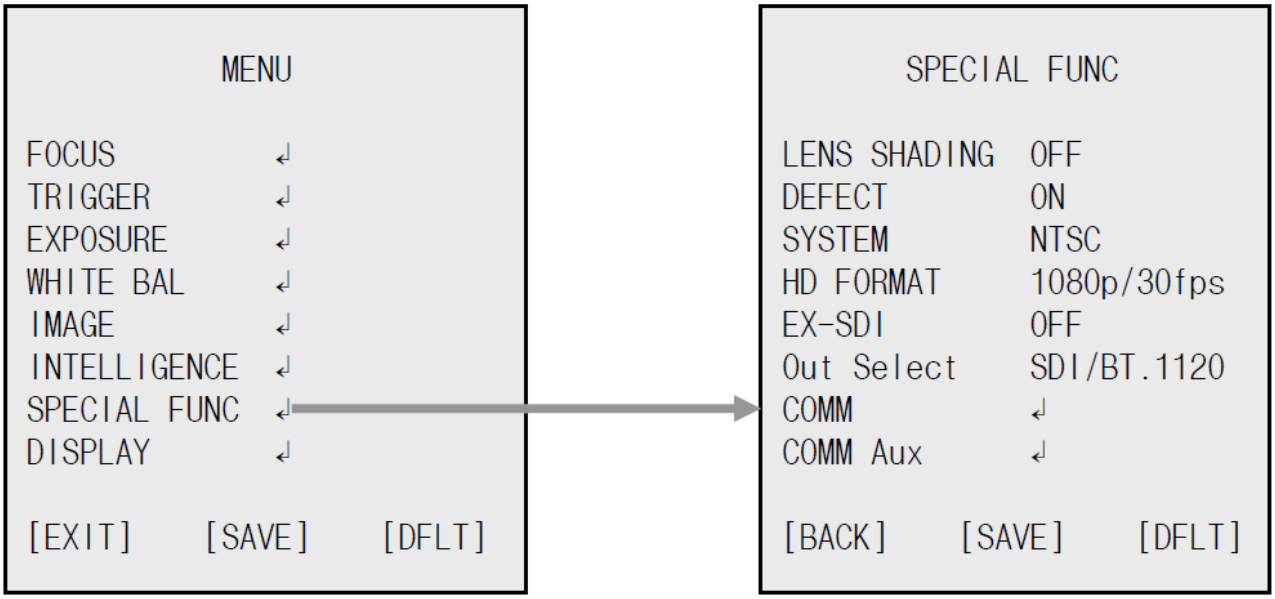
▷ MOTION VIEW: Show the detection event

▷ SENSITIVITY: Adjust sensitivity of MD (0 ~ 35 steps)

More sensitive to setting to low step with sensitivity

▷ INTERVAL TIME: Select the alarm interval time of Motion Detection Out (0 ~ 255sec)

▷ DWELL TIME: Select the duration time about changing MD mode (0 ~ 255sec)




## ◆ SPECIAL FUNC

◈ LENS SHADING : Improve light fall-off observed towards the edges of an images.

◈ DEFECT : ON / OFF↲

Compensates for bad pixels that may occur. Occurs when the whole screen is in full black or if there is bad pixelation.
To run the defect function, first full cover all area of lens.
and then press enter in OFF↲ OSD menu.

◈ SYSTEM : Select NTSC(60/30fps) or PAL(50/25fps).

◈ HD FORMAT : Select Digital output

(1080p 60/50/30/25fps, 720p 60/50/30/25fps)

◈ EX-SDI : Select EX-SDI mode

OFF (HD-SDI) / 270M V1.0 / 135M V2.0

◈ Out Select : Select signal output

SDI/BT.1120, SDI/CVBS, BT.1120/SDI, BT.1120/CVBS

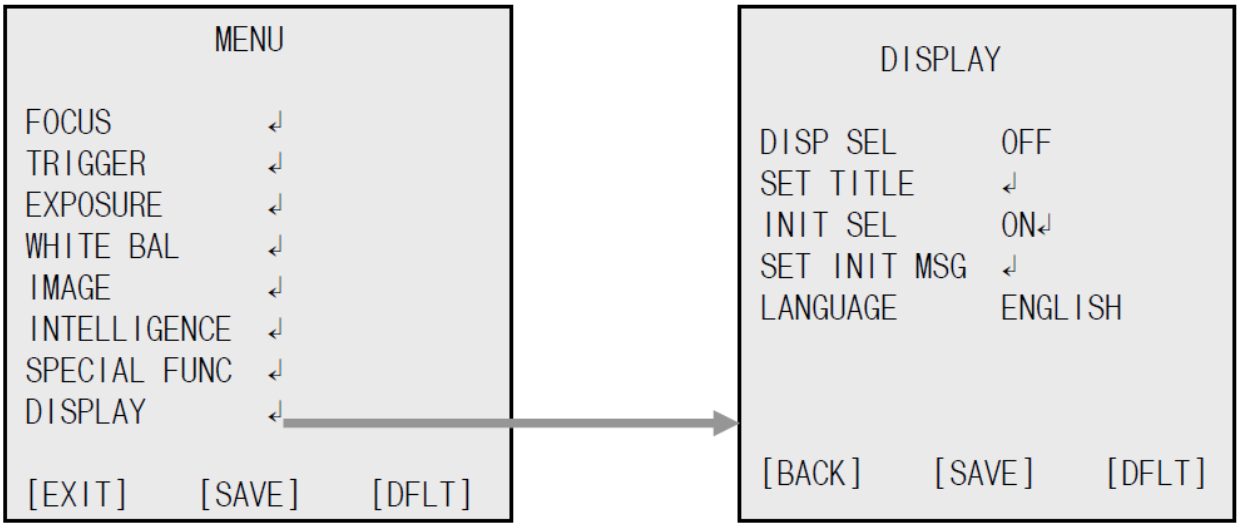
◈ COMM / COMM Aux : Set up the camera ID, baud rate, protocol

▶ ID : Select the camera ID
▷ 1 ~ 255

▶ BAUD RATE : Select serial communication speed
▷ 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200bps

▶ PROTOCOL : Select operating protocol
▷ VISCA / PELCO-D / PELCO-P / WEZ

## ◆ 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)

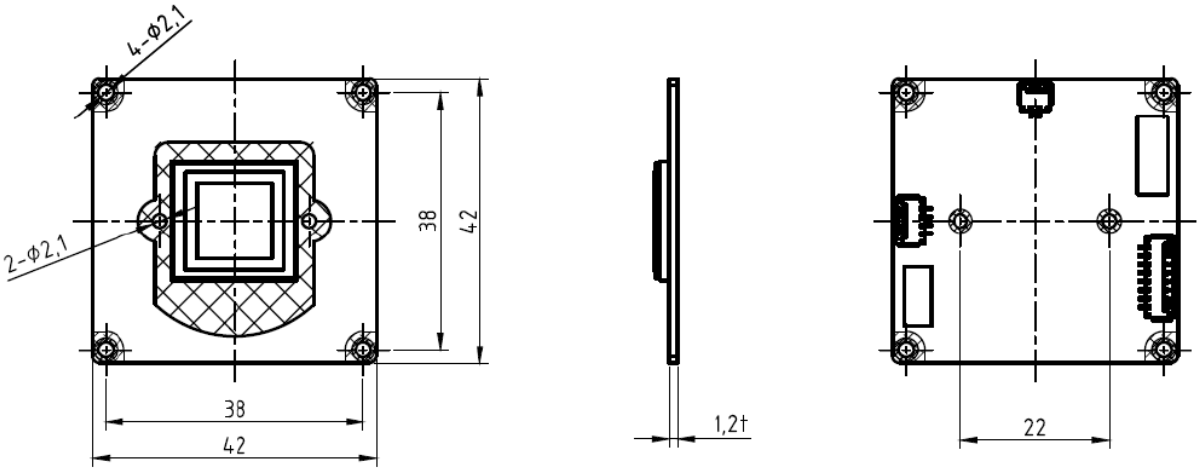
◈ LANGUAGE : Select language.
- ▶ English / Simplified Chinese / Traditional Chinese / Japanese

※ Character Table of Text edit Mode

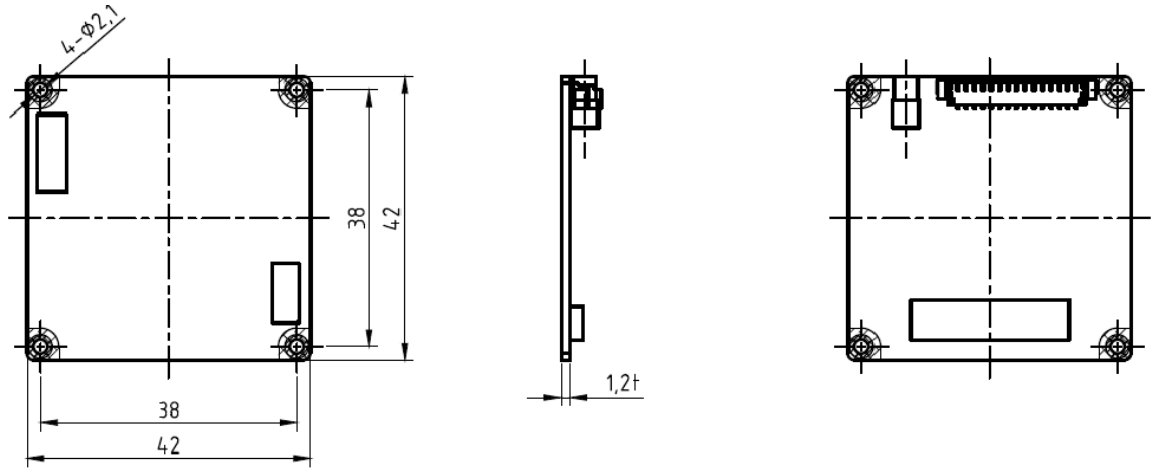
A B C D E F G H I J K L M N O P Q R S T
U V W X Y Z a b c d e f g h i j k l m
n o p q r s t u v w x y z , . ( ) { } [ ]
0 1 2 3 4 5 6 7 8 9 * + - / = ~ ! ? "'

## Camera Dimensions

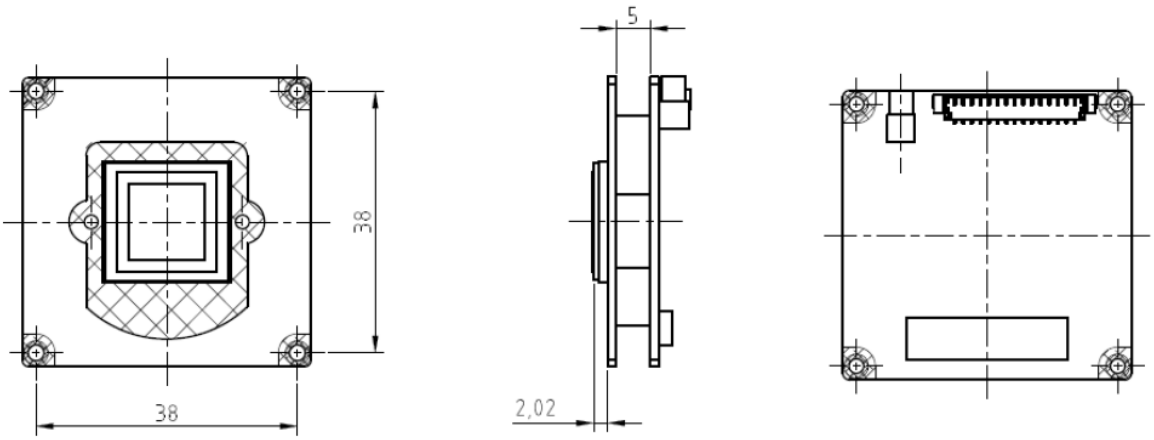
### SENSOR Board



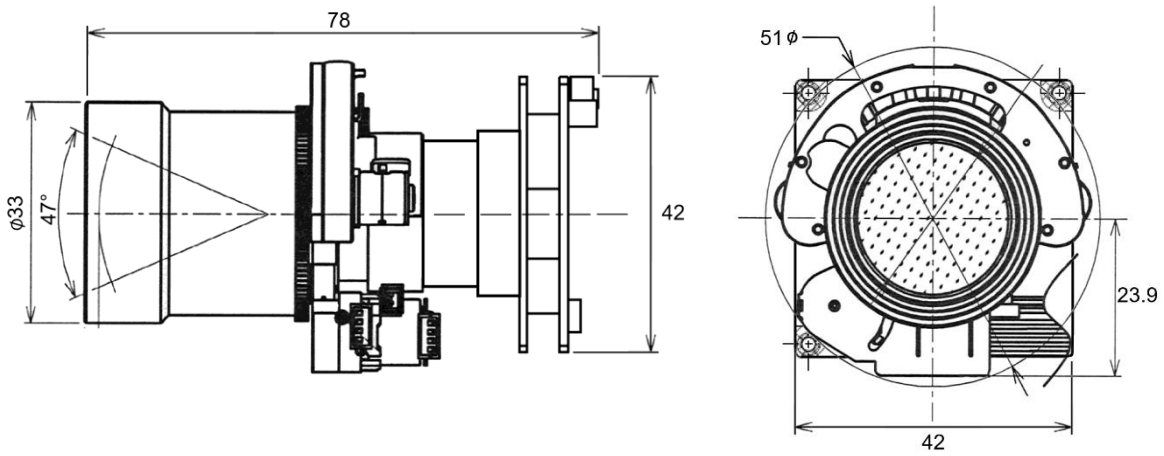

### MAIN Board




### Assembled Board Module



### ◆ Assembled Board + Lens Module




## APPROVALS

| Active Silicon makes the following approval statements: | |
|---|---|
| ***CE*** | In accordance with the CE Marking regulations, the **Oriole 3x AF-Zoom HD-SDI Board Camera** 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.<br>Therefore, no CE marking or Declaration of Conformity is required or allowed. |
| ***RoHS3*** | This product is compliant with the RoHS3 requirements (Directive 2015/863/EU). |
| ***REACH*** | Please contact Active Silicon for the latest formal REACH declaration (EC 1907/2006). |
| ***EMC*** | This product is designed to be compliant with the following requirements when housed in a suitable enclosure:<br>• EN 55022:2010 (Class A) and EN 55024:2010 (EU Directive 2014/30/EU Electromagnetic Compatibility<br>• FCC Rules for Class A digital devices |

## ORDERING INFORMATION

| ***PART NUMBER*** | ***DESCRIPTION*** |
|---|---|
| ***AS-BCAM-3SG42-00-A*** | Oriole 3x AF-Zoom HD-SDI Board Camera with Global Shutter (also EX-SDI output). |
| ***AS-BCAM-3SG42-EVAL-A*** | Evaluation Kit for Oriole 3x AF-Zoom HD-SDI Board Camera with Global Shutter. Includes power supply, cables and the Harrier Evaluation Board.<br>Not included: Camera. |

*Headquarters:*

Active Silicon Ltd
1 Waterside Court, Waterside Drive,
Langley, Berks, SL3 6EZ, UK.

Tel: +44 (0)1753 650600
Email info@activesilicon.com
Website: www.activesilicon.com

*North America:*

Active Silicon, Inc.
479 Jumpers Hole Road, Suite 301,
Severna Park, MD 21146, USA.

Tel: +1 410-696-7642
Email: info@activesilicon.com
Website: www.activesilicon.com

14-Jul-2024 TRM BCAM-3SG42 (w Jan2024 v1.04)