

# CUSTOMER'S APPROVAL SHEET

|          |          |       |         |
|----------|----------|-------|---------|
| CUSTOMER | APPROVED |       |         |
|          |          |       |         |
| SUPPLIER | DRAWN    | CHECK | APPROV. |
|          |          |       |         |



# Contents

1. Feature
2. Cautions
3. Specification
4. Connector
5. Block Diagram
6. Reliability
7. Function
8. Protocol
9. Command List
10. UTC (Up the Coax) Protocol
11. OSD Menu
12. Drawing
13. Revision History

**Feature**

- **1/2.8" Sony STARVIS CMOS sensor**

2.16M Pixels(Total) / 2.13M Pixels(Effective)

- **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 / 30fps(25fps)

1920x1080p / 60fps(50fps)

1280x720p / 30fps(25fps)

1280x720p / 60fps(50fps)

- **DAY & NIGHT (ICR)**

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

- **WDR (Wide Dynamic Range)**

WDR, more effectively than previous models,

by applying an optimum fusion ratio when combining the high speed shutter used in bright areas and the low speed shutter used in dark areas.

- **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 supports the OSD function. And so, the camera can be controlled by selecting text displayed on the monitor screen.

- **Intelligent motion detection**

You can transmit an alert signal when it detects motion of an object on the screen. This feature is useful when you have to monitor several screens simultaneously.

- **Output**

Digital output : HD-TVI, HD-SDI, EX-SDI

Analog output : NTSC, PAL Composite (without WDR)

- **Protocol**

This camera supports the multi-protocol (VISCA, PELCO-D, PELCO-P) and UTC (UP t  
he Coax) control (Pelco-C)

**Cautions****• Power Supply**

This camera must always be operated a 9V to 15V DC

**• Handling of the unit**

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

Be cautions 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 °C ~ 50 °C, however, we recommend that the unit be used within a temperature range of 0 °C ~ 45 °C)

Damp or dust place

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).

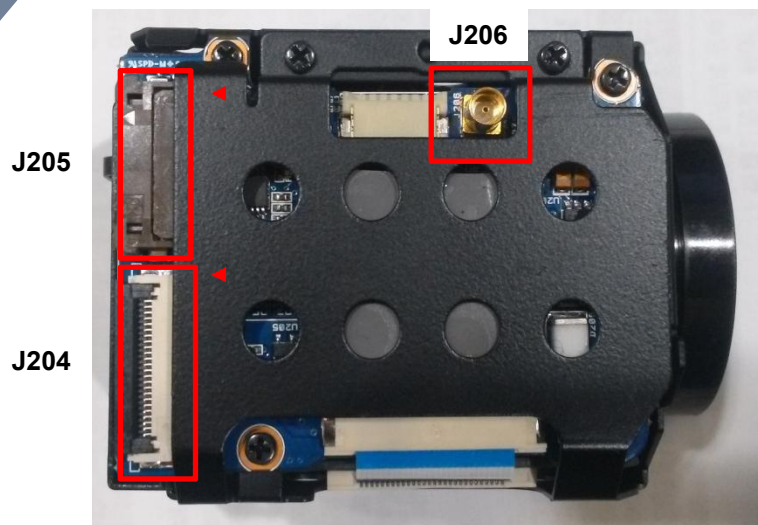
## Specification

| Model                      | LD-109                                                                                        |                                                                 |      |      |
|----------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------|------|
| Image Sensor               | 1/2.8" Sony IMX462LQR-C CMOS Sensor                                                           |                                                                 |      |      |
| Total Pixels               | 1,945(H) x 1,109(V), 2.16M Pixels                                                             |                                                                 |      |      |
| Effective pixels           | 1,945(H) x 1,097(V), 2.13M Pixels                                                             |                                                                 |      |      |
| Scanning system            | Progressive Scan                                                                              |                                                                 |      |      |
| Sync. System               | Internal                                                                                      |                                                                 |      |      |
| Resolution                 | Digital : 1080p/60(50)fps, 1080p/30(25)fps, 720p/60(50)fps, 720p/30(25)fps<br>Analog : 700TVL |                                                                 |      |      |
| Min. illumination          | Color(1/30s, 60dB) : 0.003 lux<br>Color DSS(1/8s, 60dB) : 0.00075 lux                         | BW(1/30s, 60dB) : 0.0004 lux<br>BW DSS(1/8s, 60dB) : 0.0001 lux |      |      |
| Video Output               | HD : HD-TVI / HD-SDI / EX-SDI<br>Analog SD : VBS(without WDR)                                 |                                                                 |      |      |
| 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 = 5.1mm ~ 51mm                                                                              |                                                                 |      |      |
| Aperture Ratio             | F1.6 (wide) ~ F1.8 (tele)                                                                     |                                                                 |      |      |
| Angle of View (D, H, V)    | Wide                                                                                          | 64°                                                             | 57°  | 34°  |
|                            | Tele                                                                                          | 7.1°                                                            | 6.2° | 3.5° |
| Function                   |                                                                                               |                                                                 |      |      |
| Focus                      | Focus / Distance /Zoom Speed/Lens Refresh / E.Zoom                                            |                                                                 |      |      |
| Mode                       | Auto / One Push / Manual                                                                      |                                                                 |      |      |
| Distance                   | 0.1 / 1.0 / 3.0 / 5.0 / 10.0 m                                                                |                                                                 |      |      |
| Zoom Speed                 | 0(Slow) ~ 7(Fast)                                                                             |                                                                 |      |      |
| Lens Refresh               | One Push / 1 ~ 10Day                                                                          |                                                                 |      |      |
| E.Zoom                     | Off / MAX x2 ~ x32                                                                            |                                                                 |      |      |
| Zoom Preset                | 5 preset                                                                                      |                                                                 |      |      |
| Exposure                   | Mode / AGC / Shut Speed / Iris / DSS / Flickerless / Brightness / WDR/BLC / D&N               |                                                                 |      |      |
| Mode                       | Auto / Iris. Priority / Shut. Priority / Manual                                               |                                                                 |      |      |
| Gain Control (AGC)         | Off / On                                                                                      |                                                                 |      |      |
| Shutter Speed              | 1/30(25) ~ 1/30,000 sec                                                                       |                                                                 |      |      |
| Iris                       | 0 ~ 20 steps                                                                                  |                                                                 |      |      |
| Digital Slow Shutter (DSS) | Off / x2 / x4 (/ x8 : 60 or 50 fps mode only)                                                 |                                                                 |      |      |
| Flickerless                | Off / On                                                                                      |                                                                 |      |      |
| Brightness                 | 0 ~ 20 steps                                                                                  |                                                                 |      |      |
| WDR/BLC                    | OFF / WDR / BLC                                                                               |                                                                 |      |      |
| Day&Night                  | Auto / Day / Night / Ext-in                                                                   |                                                                 |      |      |
| White Balance              | Auto / One Push / Manual / Indoor / Outdoor                                                   |                                                                 |      |      |

## Specification

| Model                    | LD-109                                                              |
|--------------------------|---------------------------------------------------------------------|
| Image                    | HLC / DNR / Mirror / Sharpness / ACE / Defog / Freeze / Gamma       |
| HLC                      | Off / On / Night Only                                               |
| DNR                      | Auto / Off / Low / Middle / High                                    |
| Mirror                   | Off / H / V / H&V                                                   |
| Sharpness                | 0 ~ 10 steps                                                        |
| ACE                      | Off / Low / Middle / High                                           |
| Defog                    | Off / On (Auto / Manual)                                            |
| Freeze                   | Off / On                                                            |
| Gamma                    | 0.45 / 0.55 / 0.65 / 0.75                                           |
| Intelligence             | Privacy / Motion / DIS                                              |
| Privacy Mask             | Off / On (24 points)                                                |
| Motion Detection         | Off / On (3 points)                                                 |
| Digital Image Stabilizer | Off / On                                                            |
| Special Func             | Defect / Image Range / System / HD Format / EX-SDI / HD-TVI / COMM  |
| Defect DET               | Off / On                                                            |
| Image Range              | Full / Comp. / User                                                 |
| 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 (※Module Type Only)                                        |
| HD-TVI                   | Off / On (※Module Type Only)                                        |
| Comm                     | ID : 1 ~ 255                                                        |
|                          | Baud Rate : 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200     |
|                          | Protocol : Pelco-P / Pelco-D / VISCA / Update                       |
| Display                  | Disp Sel / Set Title / Init Sel / Set Init Msg / Language           |
| 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             | 9V to 15V DC                                                        |
| Power Consumption        | MAX 400mA                                                           |
| General                  |                                                                     |
| Power Input              | Connector                                                           |
| Video Output             | 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       | 43(W) x 44(H) x 60.6(D)                                             |
| Weight                   | 112g                                                                |

## Connector



| J205    |                        | J204    |                        |         |         |
|---------|------------------------|---------|------------------------|---------|---------|
| Pin No. | Name                   | Pin No. | Name                   | Pin No. | Name    |
| 1       | RXD                    | 1       | GND                    | 13      | 485-DIR |
| 2       | TXD                    | 2       | TxD                    | 14      | F/W_SEL |
| 3       | GND                    | 3       | RxD                    | 15      | GND     |
| 4       | DC12V_IN               | 4       | TVI ON                 | 16      | +5V_OUT |
| 5       | GND                    | 5       | GND                    | 17      | GND     |
| 6       | VIDEO                  | 6       | TVI-OUT                | 18      | VBS-OUT |
| 7       | GND                    | 7       | GND                    | 19      | GND     |
| 8       | TVI_OUT                | 8       | ADKEY                  | 20      | DC 12V  |
| 9       | GND                    | 9       | IR-ON                  | 21      | DC 12V  |
|         |                        | 10      | D/N-IN                 | 22      | DC 12V  |
|         |                        | 11      | EX-SDI ON              | 23      | DC 12V  |
|         |                        | 12      | MD-OUT                 | 24      | DC 12V  |
| Ref     | 6200-509-130 (KYOCERA) | Ref     | 05002HR-24J05 (YEONHO) |         |         |
| J206    |                        |         |                        |         |         |
| 1       | HD-SDI Output          |         |                        |         |         |
| 2       | Board Ground           |         |                        |         |         |
| Ref     | RF Connector – MMCX    |         |                        |         |         |

## Connector

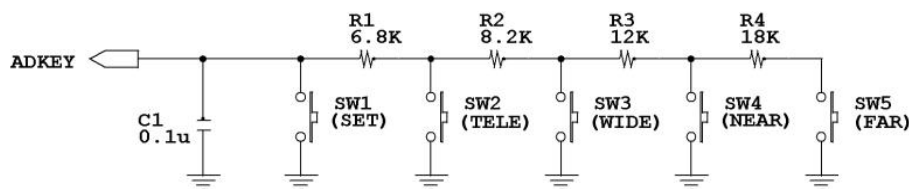
### 1. D&N IN (J204-10)

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

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

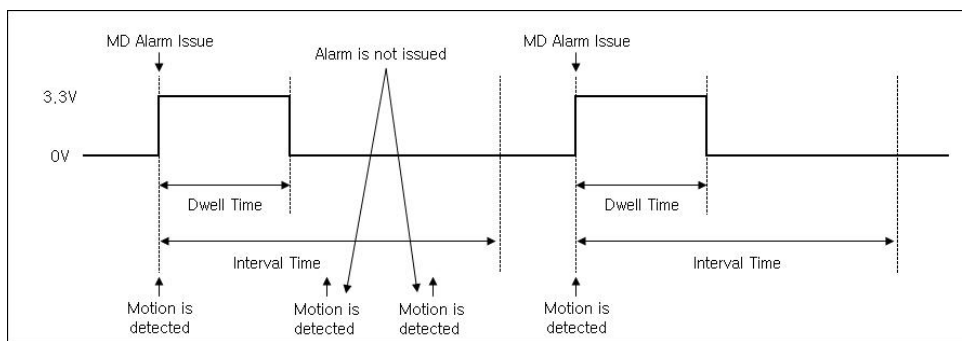
### 2. AD KEY (J204-8)

The external wired remote controller connector.



### 3. MD (J204-12)

Port giving signal output of Motion Detection Alarm



### 4. 485-DIR (J204-13)

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

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

### 5. TVI ON (J204-4)

Port giving input of HD-TVI ON/OFF

- OFF : High (+3.3V)
- ON : Low (Ground)

### 6. EX-SDI ON (J204-11)

Port giving input of EX-SDI ON/OFF

- OFF : High (+3.3V)
- ON : Low (Ground)

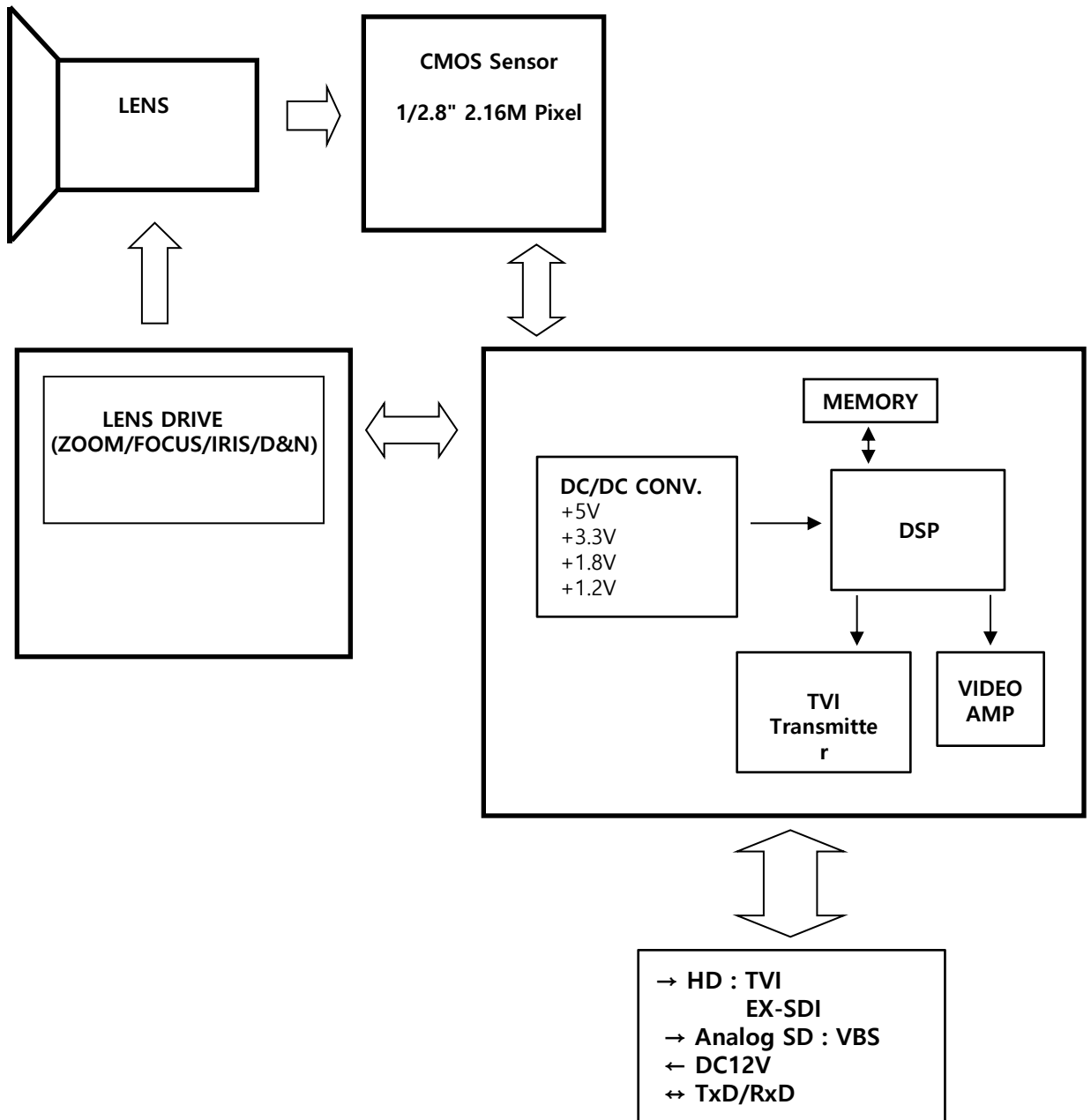

**Connector**
**7. F/W\_SEL (J204-14)**

Select Model type according to application.

- Module Type : Open
- Box Type : Connect to ground

|                                       | Module Type                                                                                                                                                                                                                        | Box Type                                                                                |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Use                                   | Select when apply to SpeedDome.<br>(Appropriate setting with using Visca Protocol control)                                                                                                                                         | Select when apply to Stand alone Camera.<br>(Appropriate setting with OSD Menu Control) |
| HD-TVI On/Off<br>EX-SDI On/Off        | OSD Menu, command or hot key<br><br>※ HD-TVI On/Off Toggle hot key<br>: Up > Down > Left > Right > Right<br><br>※ EX-SDI On/Off Toggle hot key<br>: Up > Down > Left > Right > Left<br><br>※ The hot key doesn't work in OSD menu. | TVI ON (J204-4) and EX-SDI ON (J204-11) Pin input                                       |
| OSD Display                           | Default : Off                                                                                                                                                                                                                      | Default : On                                                                            |
| Freeze                                | Zoom In/Out does not work in "Freeze On"<br>But, when you use Zoom/Focus Direct Command Zoom/Focus works in "Freeze On". (Preset Freeze function is available.)                                                                    | When you control Zoom/Focus in "Freeze On", Freeze "On" turns to "Off" automatically.   |
| Zoom Position when turn on the camera | Setting Position with CAM_CUSTOM Command. (Default : 1x)                                                                                                                                                                           | When the camera rebooted, Zoom position goes to last position.                          |

**Block Diagram**

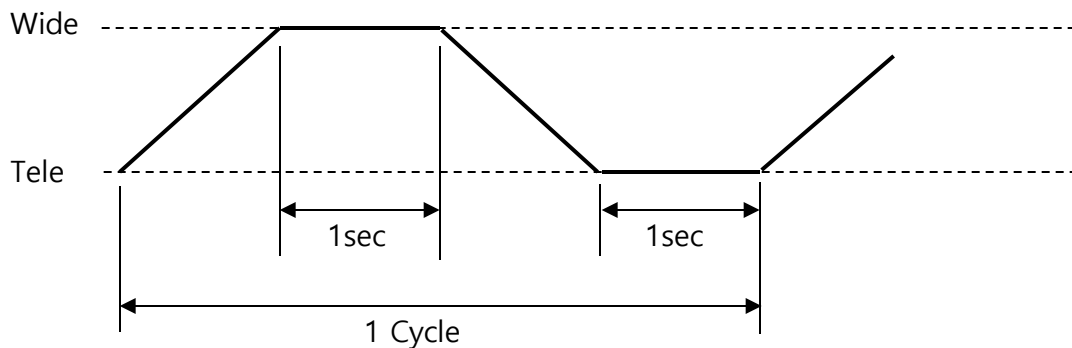


**Reliability**

## Reliability and Environment Condition(x10)

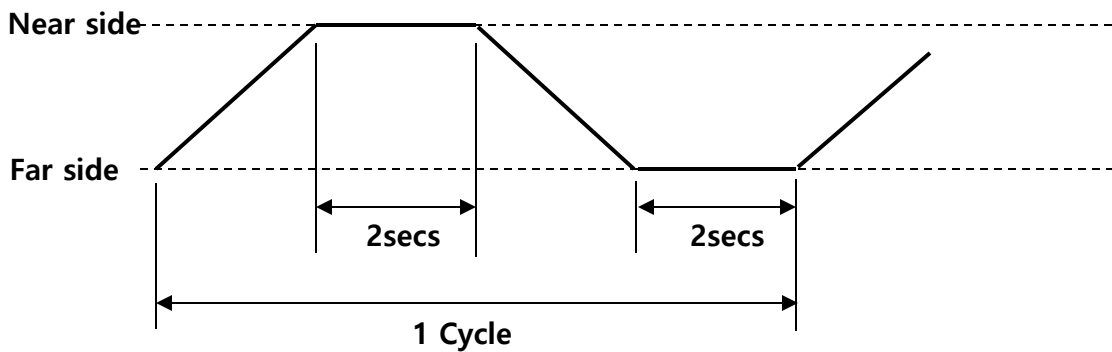
## 1. Zoom

- (1) Zoom operation cycle : 200,000 cycles
- (2) Operation condition : See below
- (3) Test condition : Normal temperature



## 2. Focus

- (1) Focus operation cycle : 200,000 cycles
- (2) Operation condition : See below
- (3) Test condition : Normal temperature

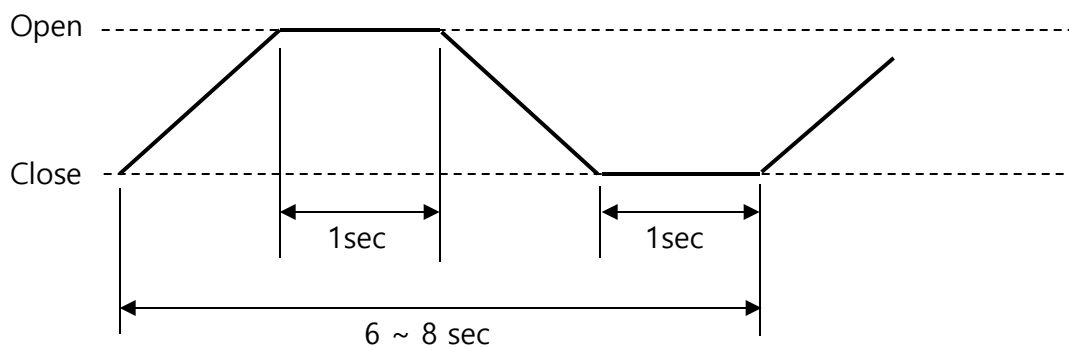


**Reliability**

## Reliability and Environment Condition(x10)

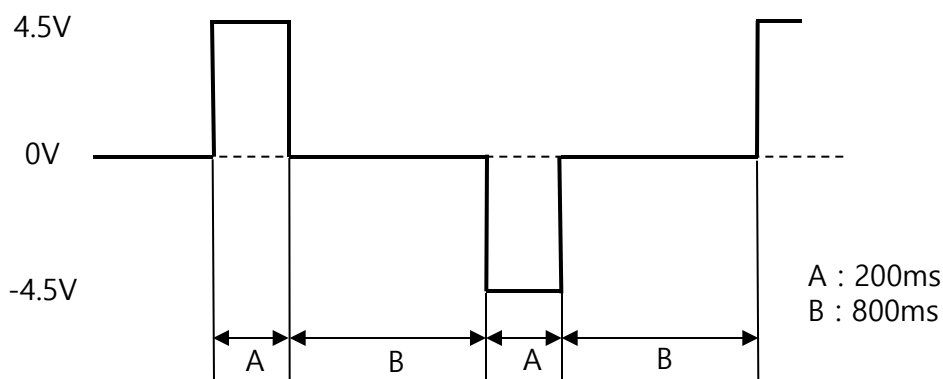
## 3. Auto-iris

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



## 4. IRCF

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



## Function

### 1. Zoom

- Max. zoom ratio
  - Optical Zoom : Max x10
  - Digital Zoom : Max x32
  - Optical + Digital Zoom : Max x320
- ※ Can't use Digital Zoom when the motion detection is turned on.
- Digital zoom mode
  - Combine mode
 

: After the optical zoom has reached its maximum level, the camera switches to digital zoom mode when zooming in. And the camera switches to optical zoom mode again after the digital zoom has reached its minimum level when zooming out.
  - Separate mode
 

: Optical zoom and digital zoom can be operated separately.

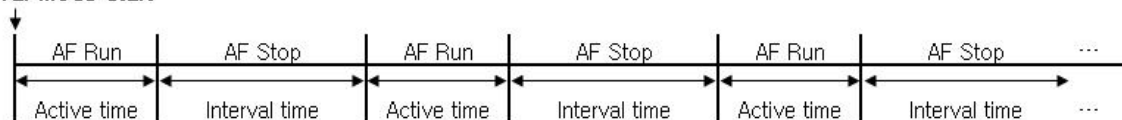
### 2. Focus

- 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.

**Function**

- *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 of 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. White balance**

- *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.*
- *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*

Function

#### 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.

#### 5. WDR (Wide Dynamic Range)

- The WDR function ensures that when images have been shot under conditions such as these, the images free from loss of dark detail or overexposure will be output, and it achieves this by combining a multiple number of images, shot at different exposure durations.

※ WDR doesn't work in Manual Exposure Mode and Shutter Priority Mode.


**Function**
**6. BLC (Back Light Compensation)**

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.

- ※ Can't use WDR and BLC at the same time.  
(When WDR On, BLC is Off. And when BLC is On, WDR is Off)
- ※ BLC doesn't work in Manual Exposure Mode.

**7. 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.

- IR Detection

on systems equipped with an IR light, the internal data of the camera is used to make the proper decisions to avoid malfunctions.

- 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.

**8. 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.

**9. Sharpness (Aperture)**

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

## Function

### 11. Privacy Mask

- Mask can be set on up to 24 places according to Pan/Tilt positions.
- Individual on/off zone masking settings.
- Two groups from among 14 colors in each group transparency can be individually set for each or 24 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 = 00h ~ Mask X = 17h
    - ※ Mask A has highest priority and Mask X 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# | -  | - | X | W | V | U | T | S | -  | - | R | Q | P | O | N | M | -  | - | L | K | J | I | H | G | -  | - | F | E | D | C | B | A |

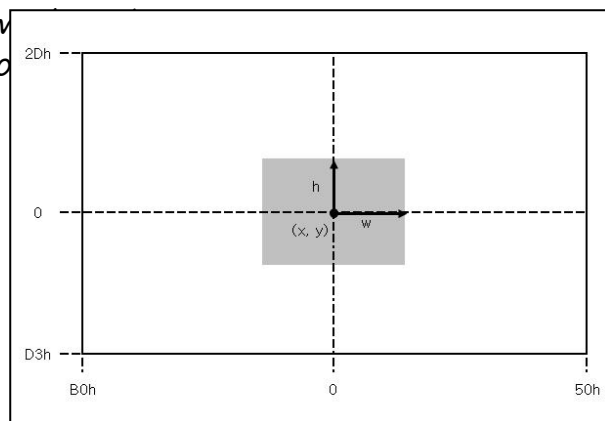
- Mask Modify setting (nn)
  - 00h = modifying the mask size for the existing mask size
  - 01h = setting newly the mask size to default value

#### - Mask Center Position

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

#### - Mask Size

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



## Function

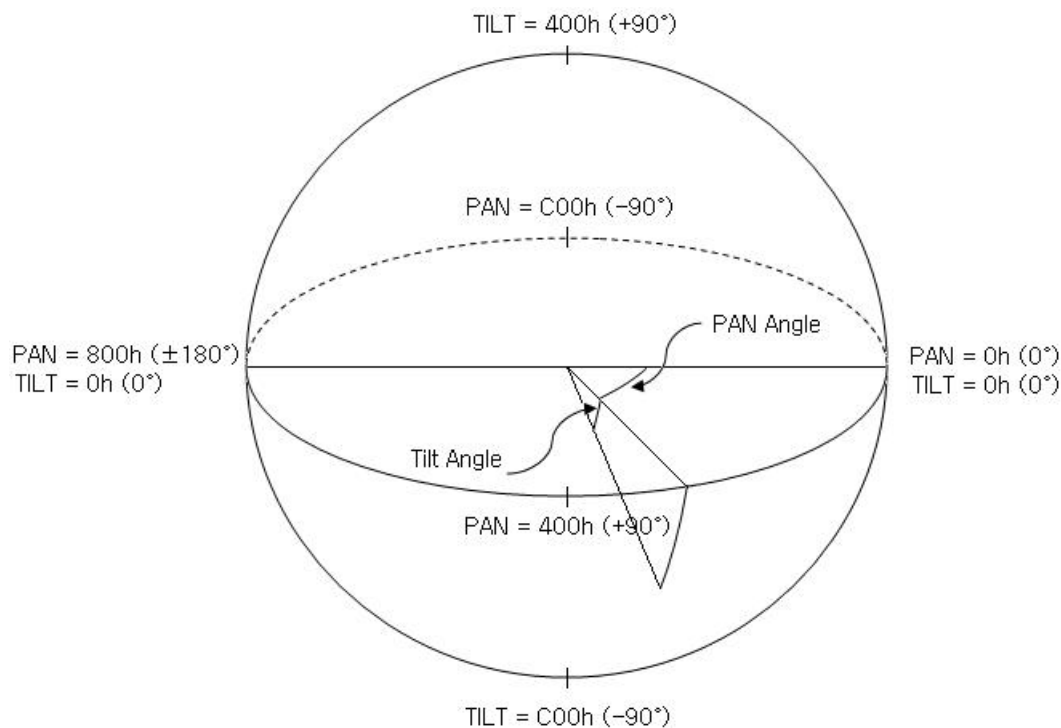
- Mask Color (qq, rr)

| Color   |                                               | Code(qq, rr)     |              |
|---------|-----------------------------------------------|------------------|--------------|
|         |                                               | Non-transparency | Transparency |
| Black   |                                               | 00h              | 10h          |
| 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 :  $-180^{\circ} \sim 180^{\circ}$ , TILT :  $-90^{\circ} \sim 90^{\circ}$ )

: Angle resolution ( 360 / 4096 )



Function**12. Motion Detection**

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

- You can set up to 3 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 : It keeps the MD Alarm Signal (MD-Out) and MD Zoom Preset Position during the set dwell time, after the alarm activated.

**13. 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 DNR Level is set too high, the camera malfunction of image ghost can be happened in dark environment.

**14. Mirror**

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

**15. 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.

**16. DEFOG**

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

**17. Lens Initialize**

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

**Function****18. 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.

※ When you use this function, you have to block the lens for blocking lights into the lens.

**19. 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.

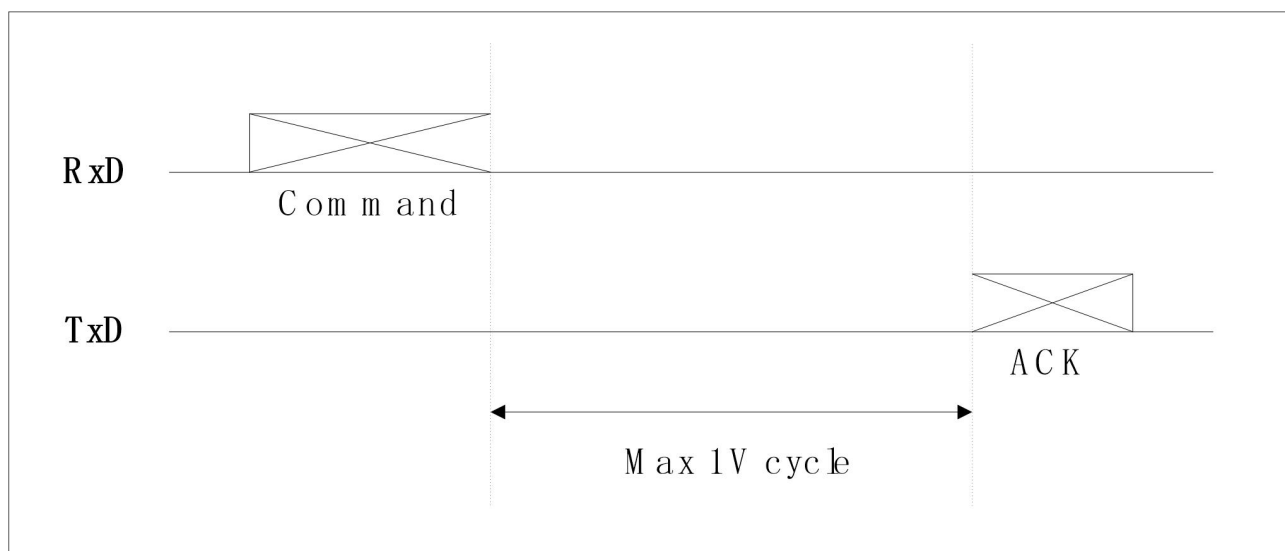
## Protocol

### 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, Pelco-P)
- Baud rate : 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
- Data bit : 8
- Start bit : 1
- Stop bit : 1
- Non parity bit


**Protocol**
**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    |
| 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 (01 ~ 05)       | CS    |
| Clear Zoom Preset | FF                   | ID    | 00    | 05       | 00         | Preset ID (01 ~ 05)       | CS    |
| Go to Zoom Preset | FF                   | ID    | 00    | 07       | 00         | Preset ID (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 8bit sum of byte 2 ~ 6 in the message.

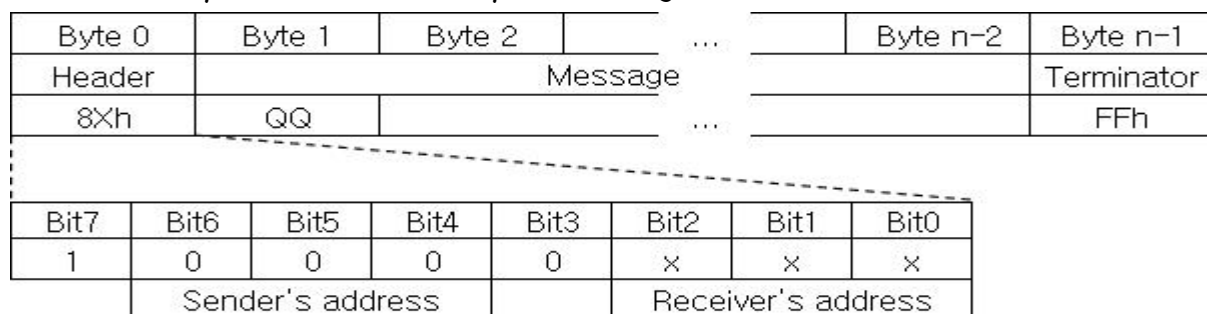
## Protocol

## 4. Pelco-P Protocol Command List

| Function                                                   | Message format (Hex) |        |        |          |            |                     |       |       |
|------------------------------------------------------------|----------------------|--------|--------|----------|------------|---------------------|-------|-------|
|                                                            | Byte1                | Byte 2 | Byte 3 | 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    |
| 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 (01 ~ 05) | AF    | CS    |
| Clear Zoom Preset                                          | A0                   | ID     | 00     | 05       | 00         | Preset ID (01 ~ 05) | AF    | CS    |
| • ID Preset Camera ID (1 ~ 255)                            | A0                   | ID     | 00     | 05       | 00         | Preset ID (01 ~ 05) | AF    | CS    |
| • XX : Speed (10h < XX < 40h)                              | A0                   | ID     | 00     | 07       | 00         | Preset ID (01 ~ 05) | AF    | CS    |
| • CS (Check Sum) : An XOR sum of byte 1 ~ 7 in the message | A0                   | ID     | 00     | 07       | 00         | Preset ID (01 ~ 05) | AF    | CS    |

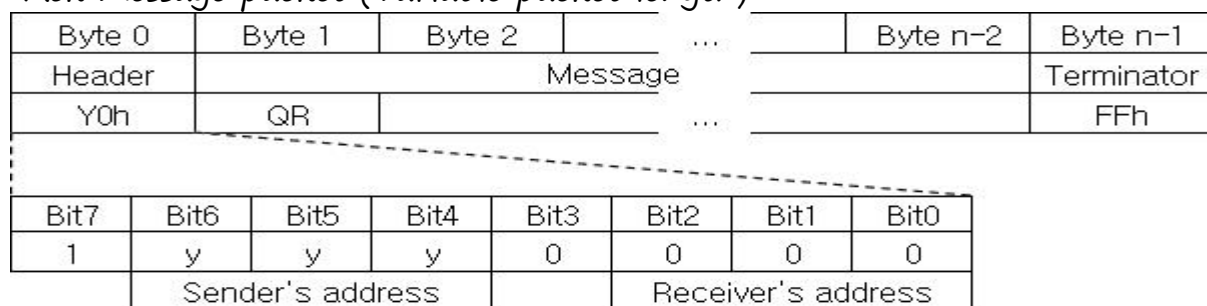

**Protocol**
**5. Visca Protocol**

- *Command packet (Variable packet length)*



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

- *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.

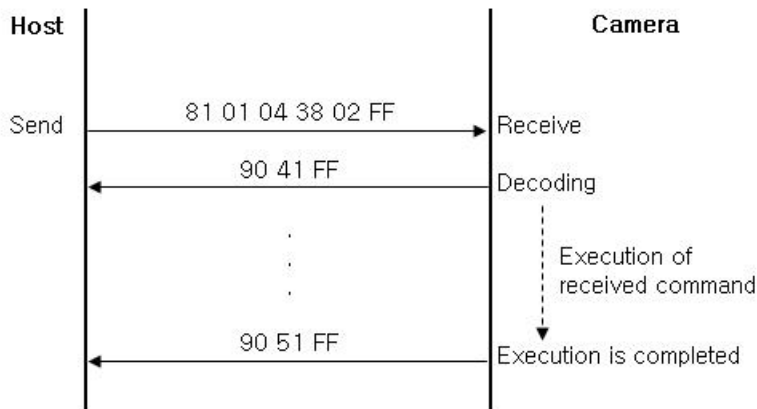
| Ack type               | Reply packet | SS | Description                 |
|------------------------|--------------|----|-----------------------------|
| Receive Ack            | Y0 4R FF     | 01 | Message length error        |
| Completion (Commands)  | Y0 5R FF     | 02 | Syntax error                |
| Completion (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      |

## Protocol

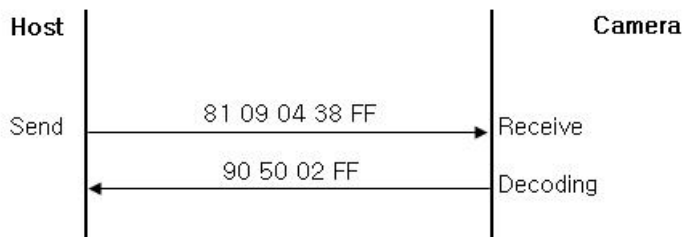
- *Example of communication*

- 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)


**Command List**

## &lt; Command &gt;

| 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                         |                                                              |
|                | 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                | pqrs : Zoom Position                                         |
| 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)<br>* Effective separate mode           |
|                | Wide (Variable)      | 8x 01 04 06 3p FF                         |                                                              |
|                | 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                         |                                                              |
|                | 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                                            |
|                | Active/Interval Time | 8x 01 04 27 0p 0q 0r 0s FF                | pq : Active Time(1~255),<br>rs : Interval Time(1~255)        |
| CAM_ZoomFocus  | Direct               | 8x 01 04 47 0p 0q 0r 0s<br>0t 0u 0v 0w FF | pqrs : Zoom Position<br>tuvw : Focus Position                |


**Command List**

## &lt; Command &gt;

| Command Set     | Command          | Command Packet             | Comments                                                                                     |
|-----------------|------------------|----------------------------|----------------------------------------------------------------------------------------------|
| CAM_Initialize  | Lens             | 8x 01 04 19 01 FF          | Lens Soft Reset                                                                              |
|                 | 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                                                                                  |
|                 | 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                                                                          |
|                 | 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(0~14h)                                                                           |
| 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(0~14h)                                                                           |
| CAM_Chroma      | Direct           | 8x 01 04 13 00 00 0p 0q FF | pq : Chroma level (0~14h)                                                                    |
| 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)                                                                 |
| 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 (0:x2, 1:x4, 2:x8)<br>※ You can't select "x8" in 30 or 25 fps 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                                                                        |
| 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                                                                           |
| 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 (0 ~ Ah)                                                                  |


**Command List**

## &lt; Command &gt;

| Command Set     | Command          | Command Packet             | Comments                                                                                               |
|-----------------|------------------|----------------------------|--------------------------------------------------------------------------------------------------------|
| CAM_AGC         | On               | 8x 01 04 5C 02 FF          | AGC Mode                                                                                               |
|                 | Off              | 8x 01 04 5C 03 FF          |                                                                                                        |
| 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                                                                                   |
| 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), 2(Night Only)                                                            |
|                 | 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 ~ Dh<br>(0:BLK, 1~6:Gray1~6, 7:WHT, 8:RED,<br>9:GRN, Ah:BLU, Bh:CYN, Ch:YEL, Dh:MAG) |
| CAM_WD          | On               | 8x 01 04 3D 02 FF          | Wide-D ON/OFF                                                                                          |
|                 | Off              | 8x 01 04 3D 03 FF          |                                                                                                        |
| CAM_WD_Level    | Direct           | 8x 01 04 7D 0p FF          | p : WDR Level (0 ~ 4)                                                                                  |
| 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 ~ 2)                                                                                  |
| 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 ~ 2)                                                                                |
|                 | Mode             | 8x 01 04 65 20 0p FF       | p : 0(Manual), 1(Auto)                                                                                 |
| 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<br>(0:0.45, 1:0.55, 2:0.65, 3:0.75)                                                   |
| 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~Ah)                                                                              |


**Command List**

## &lt; Command &gt;

| Command Set        | Command            | Command Packet                | Comments                                                                                                        |
|--------------------|--------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 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             |                                                                                                                 |
| 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                                                                                |
|                    | Threshold          | 8x 01 04 21 00 00 0p 0q FF    | pq : Threshhold level of Auto mode (0 ~ 1Ch)                                                                    |
|                    | Gap                | 8x 01 04 21 10 00 00 0p FF    | pq : On/Off Threshold Gap of Auto mode (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 - 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_StabilizerFunc | 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          | 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_DispSel        |                    | 8x 01 04 14 00 0p FF          | Display Item On(1)/Off(0)<br>p : bit[0] - ID, bit[1] - Title, bit[2] - Zoom Position<br>bit[3] - System Message |


**Command List**

## &lt; Command &gt;

| Command Set        | Command           | Command Packet                                     | Comments                                                                                                                                                                                    |
|--------------------|-------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_MultiLineTitle | Title Set1        | 8x 01 04 73 1L 00 nn 00<br>qq rr 00 00 00 00 FF    | L : Line Number (0 ~ Eh),<br>nn : H-Position (0 ~ 27h),<br>qq : Blink, rr : Opening Title                                                                                                   |
|                    | Title Set2        | 8x 01 04 73 2L mm nn pp<br>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<br>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                                  |                                                                                                                                                                                             |
| 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 ~ 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    | SetMask           | 8x 01 04 76 mm nn<br>0r 0r 0s 0s FF                | mm : MaskSettings<br>nn : 00=Modify, 01=New<br>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<br>qq rr 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, qq : Tilt                                                                                                                                             |
|                    | SetPTZMask        | 8x 01 04 7B mm 0p 0p 0p<br>0q 0q 0q 0r 0r 0r FF    | Pan/Tilt/Zoom Settings for Mask<br>mm : Mask Settings<br>ppp : Pan, qq : Tilt, rrrr : Zoom                                                                                                  |
|                    | Non_InterlockMask | 8x 01 04 6F mm<br>0p 0p 0q 0q 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 List**

## &lt; Command &gt;

| Command Set                 | Command         | Command Packet                   | Comments                                                                                                                                                                                                          |
|-----------------------------|-----------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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)<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)<br>p : Start Horizontal Position ( 00 ~ 0Eh)<br>q : Start Vertical Position (00 ~ 07)<br>r : End Horizontal Position (01 ~ 0Fh)<br>s : End Vertical Position (01 ~ 08h) |
|                             | 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                                                                                                                                                                       |
|                             | Alarm (Reply)   | y0 07 04 1B 0p FF                | p : Detection Frame Set                                                                                                                                                                                           |
| CAM_Continuous ZoomPosReply | On              | 8x 01 04 69 02 FF                | Zoom Positon data continues output On/Off                                                                                                                                                                         |
|                             | Off             | 8x 01 04 69 03 FF                |                                                                                                                                                                                                                   |
|                             | (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>qqqq : Zoom Position                                                                                                                                |
| CAM_Reply IntervalTimeSet   |                 | 8x 01 04 6A 00 00 0p 0q FF       | pq : Interval Time [Vertical timing]                                                                                                                                                                              |
| CAM_RegisterValue           |                 | 8x 01 04 24 mm 0p 0q FF          | mm : Register No.<br>(00, 52h, 60h, 72h, 73h, 90h, 91h, 9Ah, 9Bh)<br>pq : Register Value                                                                                                                          |


**Command List**

## &lt; Inquiry Command &gt;

| 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 02 FF          | Auto Focus                                                                                   |
|                         |                   | y0 50 03 FF          | Manual Focus                                                                                 |
| CAM_FocusPosInq         | 8x 09 04 48 FF    | y0 50 0p 0q 0r 0s FF | pqrs : Focus Position                                                                        |
| 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 00 FF          | Normal AF                                                                                    |
|                         |                   | y0 50 01 FF          | Interval AF                                                                                  |
|                         |                   | y0 50 02 FF          | Zoom Trigger AF                                                                              |
| 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_CompScanThrsInq     | 8x 09 04 19 03 FF | y0 50 00 00 0p 0q FF | pq : White spot compensation Threshold                                                       |
| 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                                                                                       |
| 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_AEModelInq          | 8x 09 04 39 FF    | y0 50 00 FF          | Full Auto                                                                                    |
|                         |                   | y0 50 03 FF          | Manual                                                                                       |
|                         |                   | y0 50 0A FF          | Shutter Priority                                                                             |
|                         |                   | y0 50 0B FF          | Iris Priority                                                                                |
|                         |                   | y0 50 0D FF          | Bright                                                                                       |
| CAM_SlowShutterModelInq | 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:x4, 2:x8)<br>※ You can't select "x8" in 30 or 25 fps mode |
| CAM_ShutterPosInq       | 8x 09 04 4A FF    | y0 50 00 00 0p 0q FF | pq : Shutter Position                                                                        |
| CAM_IrisPosInq          | 8x 09 04 4B FF    | y0 50 00 00 0p 0q FF | pq : Iris Position                                                                           |
| CAM_GainPosInq          | 8x 09 04 4C FF    | y0 50 00 00 0p 0q FF | pq : Gain Position                                                                           |
| CAM_AGCMModelInq        | 8x 09 04 5C FF    | y0 50 02 FF          | On                                                                                           |
|                         |                   | y0 50 03 FF          | Off                                                                                          |


**Command List**

## &lt; Inquiry Command &gt;

| Inquiry Command         | Command Packet    | Inquiry Packet       | Comments                                                                                               |
|-------------------------|-------------------|----------------------|--------------------------------------------------------------------------------------------------------|
| CAM_BrightPosInq        | 8x 09 04 4D FF    | y0 50 00 00 0p 0q FF | pq : Bright Position                                                                                   |
| CAM_ExpCompModelInq     | 8x 09 04 3E FF    | y0 50 02 FF          | On                                                                                                     |
|                         |                   | y0 50 03 FF          | Off                                                                                                    |
| CAM_ExpCompPosInq       | 8x 09 04 4E FF    | y0 50 00 00 0p 0q FF | pq : ExpComp Position                                                                                  |
| CAM_FlickerlessInq      | 8x 09 04 7A FF    | y0 50 02 FF          | On                                                                                                     |
|                         |                   | y0 50 03 FF          | Off                                                                                                    |
| CAM_BackLightModelInq   | 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 : 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_HLCModelInq         | 8x 09 04 32 00 FF | y0 50 0p FF          | p : HLC Mode - 0(Off), 1(On), 2(Night)                                                                 |
| 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 ~ Dh<br>(0:BLK, 1~6:Gray1~6, 7:WHT, 8:RED,<br>9:GRN, Ah:BLU, Bh:CYN, Ch:YEL, Dh:MAG) |
| CAM_WDModelInq          | 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)                                                                                  |
| CAM_ACEInq              | 8x 09 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_DefogModelInq       | 8x 09 04 65 20 FF | y0 50 0p FF          | p : Defog Mode - 0(Manual), 1(Auto)                                                                    |
| CAM_DNRModelInq         | 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 ~ 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                                                                                                    |
| CAM_ICRStateInq         | 8x 09 04 01 FF    | y0 50 02 FF          | Night                                                                                                  |
|                         |                   | y0 50 03 FF          | Day                                                                                                    |


**Command List**

## &lt; Inquiry Command &gt;

| Inquiry Command          | Command Packet    | Inquiry Packet          | Comments                                                                                 |
|--------------------------|-------------------|-------------------------|------------------------------------------------------------------------------------------|
| 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_ICRThresholdInq      | 8x 09 04 21 FF    | y0 50 00 00 0p 0q FF    | pq : Trheshold 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_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_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 (0:OFF, 1:Half, 2:Full)                                          |
| 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)                                                                      |
|                          |                   |                         | pqrs : 0000 ~ FFFFh (Data)                                                               |
| CAM_DisplayInq           | 8x 09 04 15 FF    | y0 50 02 FF             | On                                                                                       |
|                          |                   | y0 50 03 FF             | Off                                                                                      |
| CAM_DispSellInq          | 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<br>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 0r 0s FF | mm : Mask Number                                                                         |
|                          |                   |                         | 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 r  | pppppppp : Mask Color Setting                                                            |
|                          |                   | r FF                    | 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    | ppp : Pan, qq : Tilt                                                                     |
|                          |                   | 0q FF                   |                                                                                          |


**Command List**

## &lt; Inquiry Command &gt;

| 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, rrrr : 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_VersionInq                         | 8x 09 00 02 FF    | y0 50 00 20                               | mnpq : Model Code (0466h)                                                                                                                                                                                              |
|                                        |                   | mn pq rs tu vw FF                         | rstu : ROM version (0100h)<br>vw : Socket Number (3)                                                                                                                                                                   |
| CAM_ModelInq                           | 8x 09 00 37 FF    | y0 50 pp pp pp qq qq<br>FF                | pppppp : Model Code<br>*Module Type : YY565Ah<br>*Box Type : YY5658h<br>(YY : Custom. Code, standard model = 00)<br>qqqq : Version                                                                                     |
|                                        |                   |                                           |                                                                                                                                                                                                                        |
| 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[3]:3)<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)<br>p : Start Horizontal Position ( 00 ~ 0Eh)<br>q : Start Vertical Position ( 00 ~ 07)<br>r : Stop Horizontal Position ( 01 ~ 0Fh)<br>s : Stop Vertical Position ( 01 ~ 08h) |
|                                        |                   |                                           |                                                                                                                                                                                                                        |
| 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>(00, 52h, 60h, 72h, 73h, 90h, 91h, 9Ah, 9Bh)                                                                                                                                                      |
|                                        |                   |                                           | pp : Register Value                                                                                                                                                                                                    |

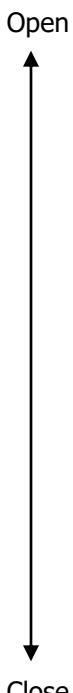

**Command List**

## &lt; Exposure control values &gt;

**Shutter Speed (Hex)**

| Step (Hex) | NTSC    | PAL     |
|------------|---------|---------|
| 0D         | 1/30000 | 1/30000 |
| 0C         | 1/10000 | 1/10000 |
| 0B         | 1/7000  | 1/7000  |
| 0A         | 1/5000  | 1/5000  |
| 9          | 1/2500  | 1/2500  |
| 8          | 1/1600  | 1/1600  |
| 7          | 1/1000  | 1/1000  |
| 6          | 1/700   | 1/700   |
| 5          | 1/250   | 1/250   |
| 4          | 1/120   | 1/100   |
| 3          | 1/60    | 1/50    |
| 2          | 1/30    | 1/25    |
| 1          | 1/15    | 1/12    |
| 0          | 1/8     | 1/6     |

**Iris (Hex)**

|    |                                                                                                                     |
|----|---------------------------------------------------------------------------------------------------------------------|
| 11 | <div>Open</div>  <div>Close</div> |
| 10 |                                                                                                                     |
| 0F |                                                                                                                     |
| 0E |                                                                                                                     |
| 0D |                                                                                                                     |
| 0C |                                                                                                                     |
| 0B |                                                                                                                     |
| 0A |                                                                                                                     |
| 09 |                                                                                                                     |
| 08 |                                                                                                                     |
| 07 |                                                                                                                     |
| 06 |                                                                                                                     |
| 05 |                                                                                                                     |
| 00 |                                                                                                                     |

**Bright (Hex)**

| Step | IRIS | GAIN |
|------|------|------|
| 1B   | 11   | A    |
| 1A   | 11   | 9    |
| 19   | 11   | 8    |
| 18   | 11   | 7    |
| 17   | 11   | 6    |
| 16   | 11   | 5    |
| 15   | 11   | 4    |
| 14   | 11   | 3    |
| 13   | 11   | 2    |
| 12   | 11   | 1    |
| 11   | 11   | 0    |
| 10   | 10   | 0    |
| 0F   | 0F   | 0    |
| 0E   | 0E   | 0    |
| 0D   | 0D   | 0    |
| 0C   | 0C   | 0    |
| 0B   | 0B   | 0    |
| 0A   | 0A   | 0    |
| 09   | 09   | 0    |
| 08   | 08   | 0    |
| 07   | 07   | 0    |
| 06   | 06   | 0    |
| 05   | 05   | 0    |
| 00   | 00   | 0    |

Command List

## &lt; Zoom &amp; Focus control values &gt;

## Optical Zoom

| Magnification | Zoom Position |
|---------------|---------------|
| ×1            | 0000          |
| ×2            | 1816          |
| ×3            | 240B          |
| ×4            | 2BC7          |
| ×5            | 31AB          |
| ×6            | 363D          |
| ×7            | 39B6          |
| ×8            | 3C65          |
| ×9            | 3E81          |
| ×10           | 4000          |

## Focus Near Limit

|      |      |
|------|------|
| 1000 | 10m  |
| 2000 |      |
| 3000 |      |
| 4000 | 5m   |
| 5000 |      |
| 6000 | 3m   |
| 7000 |      |
| 8000 |      |
| 9000 | 1m   |
| A000 |      |
| B000 |      |
| C000 |      |
| D000 | 10cm |
| E000 |      |
| F000 |      |
|      |      |

## D-Zoom : Combine 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            |


**Command List**

## &lt; OSD character values &gt;

|            |          |            |
|------------|----------|------------|
| 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   | Ò         |
| 09   | )         | 2A   | J         | 4B   | k         | 6C   | Ö         |
| 0A   | *         | 2B   | K         | 4C   | l         | 6D   | Ù         |
| 0B   | +         | 2C   | L         | 4D   | m         | 6E   | Ú         |
| 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         |      |           |


**Command List**

## &lt; Register Setting &gt;

| Function                            | Register No. | Value   |                                        |
|-------------------------------------|--------------|---------|----------------------------------------|
| BaudRate                            | 00           | 10      | 2400 bps                               |
|                                     |              | 11      | 4800 bps                               |
|                                     |              | 00      | 9600 bps                               |
|                                     |              | 01      | 19200 bps                              |
|                                     |              | 02      | 38400 bps                              |
|                                     |              | 03      | 57600 bps                              |
|                                     |              | 04      | 115200 bps                             |
| E.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      | 720p/30fps                             |
|                                     |              | 11      | 720p/25fps                             |
|                                     |              | 13      | 1080p/60fps                            |
|                                     |              | 14      | 1080p/50fps                            |
| Output Enabling                     | 73           | 02      | Analog output disabled                 |
|                                     |              | 03      | Analog output enabled                  |
|                                     |              | 04      | Analog output auto detection           |
| Image range mode                    | 90           | 0       | Full mode                              |
|                                     |              | 1       | Comp mode                              |
|                                     |              | 2       | User mode                              |
| Image range custom level            | 91           | 0 ~ 20  |                                        |
| EX-SDI mode<br>(※ Module type only) | 9A           | 0       | Off                                    |
|                                     |              | 1       | On                                     |
| HD-TVI mode<br>(※ Module type only) | 9B           | 0       | Off                                    |
|                                     |              | 1       | On                                     |

 **Command List**

## &lt; Other control values &gt;

|                        |           |   |              |
|------------------------|-----------|---|--------------|
| AF Active Time         | 00 (0sec) | ~ | FFh (255sec) |
| AF Interval Time       | 00 (0sec) | ~ | FFh (255sec) |
| R Gain                 | 00        | ~ | 14h          |
| B Gain                 | 00        | ~ | 14h          |
| Aperture Level         | 00        | ~ | 0Ah          |
| Threshold Level of ICR | 00        | ~ | 1Ch          |
| Gap Level of ICR       | 00        | ~ | 04h          |

## UTC Protocol

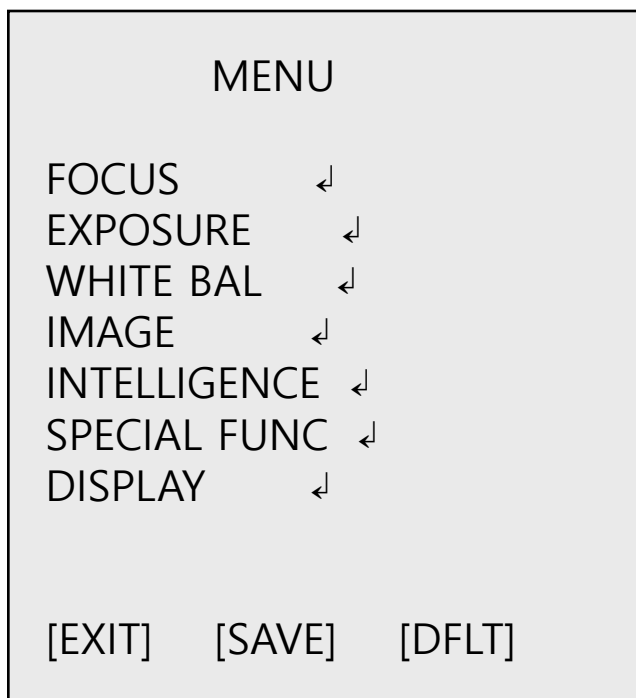
## 1. UTC (Up the Coax) Pelco-C(Digital Coaxitron) Protocol Command List

| 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    |
| 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 (01 ~ 05)       | CS    |
| Clear Zoom Preset | FF                   | ID    | 00    | 05       | 00         | Preset ID (01 ~ 05)       | CS    |
| Go to Zoom Preset | FF                   | ID    | 00    | 07       | 00         | Preset ID (01 ~ 05)       | CS    |
| Focus Mode        | FF                   | ID    | 00    | 2B       | 00         | 00,01:Auto<br>02 : Manual | CS    |

- ID : Camera ID is don't care
- XX : Speed ( $10h < XX \leq 40h$ )
- CS(Check Sum) : An 8bit sum of byte 2 ~ 6 in the message.

 OSD Menu

## ◆ Main Menu

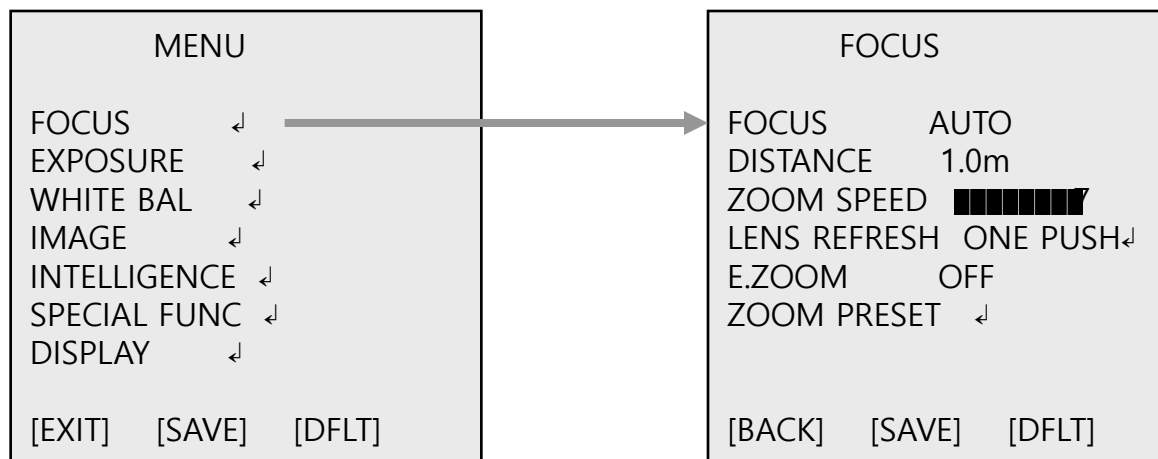


Functions can be setup using "Menu Key Command" of Visca protocol.  
The menu consists of the "Main Menu" and "Sub Menu".  
The main menu is displayed where 7 camera functions can be selected.  
To the push of each main menu selection, the sub-menu is displayed

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

If you want not save the menu, select [EXIT] (After select , Power off -> on)

If you want default the menu, select [DFLT]


**OSD Menu**
◆ **FOCUS**

- ◆ *FOCUS : Select auto focus mode*
  - ▶ AUTO, ONE PUSH, MANUAL
- ◆ *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)
- ◆ *E.ZOOM : Select maximum digital zoom magnification.*
  - ▶ OFF / ON (max x2 ~ x19, x21, x23, x25, x28, x32)
- ◆ *ZOOM PRESET : Select zoom preset*
  - ▶ PRESET # : Select Zoom preset number (1 ~ 5)
  - ▶ MODE : OFF / ON↓
    - ▷ ON↓ : Adjust the Zoom Position


**OSD Menu**
◆ **EXPOSURE**

| MENU         |               |
|--------------|---------------|
| FOCUS        | ↓             |
| EXPOSURE     | ↓             |
| WHITE BAL    | ↓             |
| IMAGE        | ↓             |
| INTELLIGENCE | ↓             |
| SPECIAL FUNC | ↓             |
| DISPLAY      | ↓             |
| [EXIT]       | [SAVE] [DFLT] |

| EXPOSURE    |                                                                                     |
|-------------|-------------------------------------------------------------------------------------|
| MODE        | AUTO                                                                                |
| AGC         | ON                                                                                  |
| SHUT SPEED  | ---                                                                                 |
| IRIS        | ---                                                                                 |
| DSS         | OFF                                                                                 |
| FLICKERLESS | OFF                                                                                 |
| BRIGHTNESS  |  |
| WDR/BLC     | OFF                                                                                 |
| DAY&NIGHT   | AUTO↓                                                                               |
| [BACK]      | [SAVE] [DFLT]                                                                       |

- ◆ **MODE** : Select Exposure Mode  
 ► AUTO / IRIS.P / SHUT.P / MANUAL
- ◆ **AGC** : Select Auto Gain Control  
 ► OFF / ON (AUTO, SHUT.P or IRIS.P Mode)  
 ► 0 ~ 10 (MANUAL Mode)
- ◆ **SHUT SPEED** : Can be set in SHUT.P or MANUAL mode
  - \* 60 / 50 fps mode
    - x8, x4, x2, 1/60(50), 1/120(100), 1/250, 1/700, 1/1000, 1/1600, 1/2500, 1/5000, 1/7000, 1/10000, 1/30000 sec
  - \* 30 / 25 fps mode
    - x4, x2, 1/30(25), 1/60(50), 1/120(100), 1/250, 1/700, 1/1000, 1/1600, 1/2500, 1/5000, 1/7000, 1/10000, 1/30000 sec
- ◆ **IRIS** : Iris level can be set in IRIS.P or MANUAL mode  
 ► 0 ~ 20
- ◆ **DSS** : Select maximum DSS (Digital Slow Shutter)
  - \* 60 / 50 fps mode
    - OFF / x2, x4, x8
  - \* 30 / 25 fps mode
    - OFF / x2, x4


**OSD Menu**

- ◆ *FLICKERLESS : Select flickerless mode*
  - ▶ *OFF / ON (remove screen flicker)*
- ◆ *BRIGHTNESS : Adjust brightness level*
  - ▶ *0(dark) ~ 20(bright) steps*
- ◆ *WDR/BLC : Select WDR(Wide Dynamic Range) or BLC(Back Light compensation)*
  - ▶ *WDR↓*
    - ▷ *LEVEL : Adjust WDR level.*
      - ▶ *LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH*
  - ※ *WDR doesn't work in Manual Exposure Mode and Shutter Priority Mode*
  - ※ *When WDR on, CVBS output is disabled.*
  - ▶ *BLC↓*
    - ▷ *POSITION : Adjust the window position*
    - ▷ *SIZE : Adjust the window size*
  - ※ *Can't use WDR and BLC at the same time.*  
*(When WDR On, BLC is Off. And when BLC is On, WDR is Off)*
  - ※ *BLC doesn't work in Manual Exposure Mode.*
- ◆ *DAY&NIGHT : Select Day&Night*
  - ▶ *MODE : AUTO↓ / EXT-IN↓ / DAY / NIGHT↓*
    - ▷ *AUTO*
      - ▶ *DELAY : 0 ~ 255 sec*
      - ▶ *THRS : 0 ~ 28*  
*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*

 OSD Menu

## ▷ EXT-IN

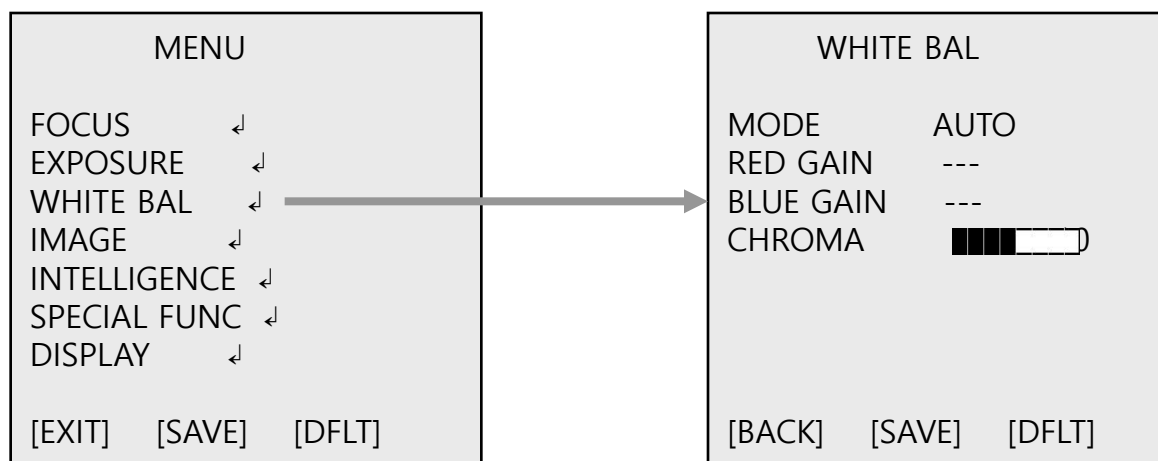
▶ DELAY : 0 ~ 255 sec

▶ BURST : OFF / ON

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

## ▷ NIGHT

▶ BURST : OFF / ON

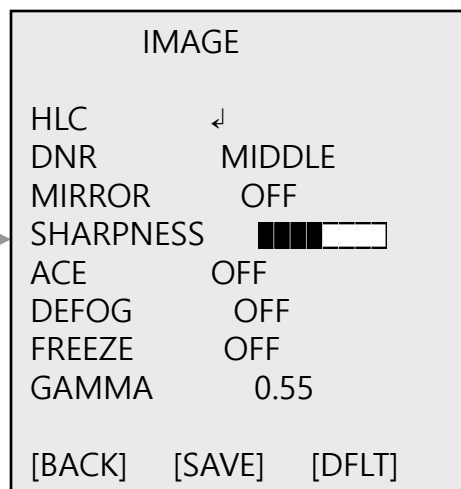
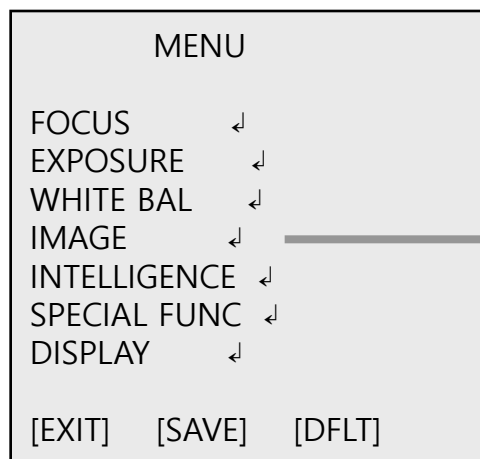

**OSD Menu**
◆ **WHITE BALANCE**◆ **AWB : Select WHITE BALANCE mode**► **AUTO / ONE PUSH↓ / MANUAL / INDOOR / OUTDOOR**

- ▷ **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**

## OSD Menu

## ◆ IMAGE



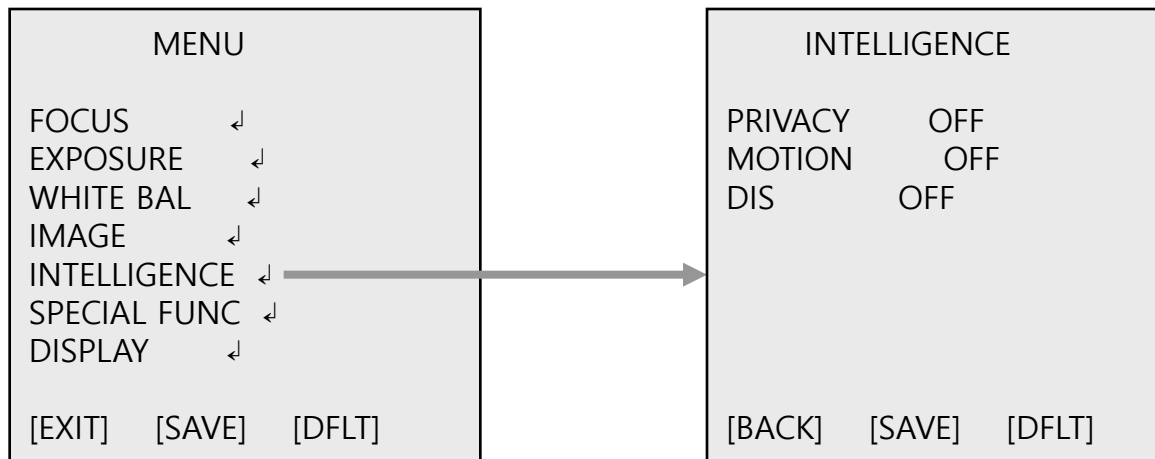
- ◆ HLC : Select High Light Compensation.  
When extremely bright light is projected to the camera masking is used on the portion to prevent partial saturation on the monitor.
    - ▷ MODE : OFF / ON / NIGHT
    - ▷ LEVEL : 0 ~ 20 steps
    - ▷ COLOR : 0 ~ 13 steps
  - ◆ DNR : Select Digital Noise Reduction
    - ▷ OFF / LOW / MIDDLE / HIGH / AUTO
  - ◆ 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 / LOW / MIDDLE / HIGH
  - ◆ DEFOG : Carry out defog function
    - ▷ OFF / ON↓
      - ▷ MODE : AUTO / MANUAL
      - ▷ LEVEL : LOW / MIDDLE / HIGH
- ※ Can't use DEFOG and ACE at the same time  
(When DEFOG is On, ACE is Off)

 OSD Menu

- ◆ *Freeze : Select real or still mode*
  - ▶ *OFF / ON*
- ◆ *GAMMA : Select GAMMA*
  - ▶ *0.45 / 0.55 / 0.65 / 0.75*


**OSD Menu**

## ◆ INTELLIGENCE

◆ *PRIVACY : Hide an area you want to hide on the screen*▶ *OFF / ON↓*

- ▷ *MASK# : Select mask area number (1 ~ 24)*
- ▷ *MODE : Mask enable or disable (OFF / ON)*
- ▷ *POSITION : Adjust the mask position*
- ▷ *SIZE : Adjust the mask size*
- ▷ *COLOR : Select mask color (0 ~ 13)*
- ▷ *TRANS : Select mask transparency level (0 ~ 4)*

◆ *MOTION : When there is movement of the subject in the screen, there will be an motion detection*▶ *OFF / ON↓*

- ▷ *AREA# : Setting 3 areas(1~3) 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↓ )*

 OSD Menu

- ◆ DIS : Select Digital Image Stabilizer mode
  - ▶ OFF / ON↓
    - ▷ RANGE : Setting the image compensation range. (10%, 20%, 30%)
    - ▷ FILTER : Setting the sensitivity to hold DIS function in worst case.  
(LOW, MIDDLE, HIGH)
    - ▷ AUTO C : Setting Auto Centering mode (OFF, HALF, FULL)


**OSD Menu**
◆ **SPECIAL FUNC**

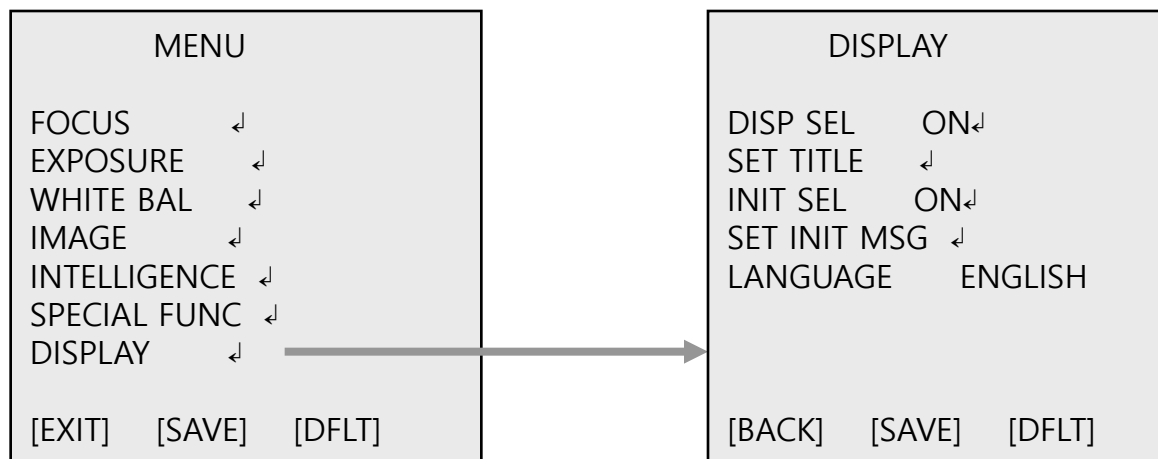
| MENU         |               |
|--------------|---------------|
| FOCUS        | ↓             |
| EXPOSURE     | ↓             |
| WHITE BAL    | ↓             |
| IMAGE        | ↓             |
| INTELLIGENCE | ↓             |
| SPECIAL FUNC | ↓             |
| DISPLAY      | ↓             |
| [EXIT]       | [SAVE] [DFLT] |

| SPECIAL FUNC |               |
|--------------|---------------|
| DEFECT       | ↓             |
| IMAGE RANGE  | COMP          |
| SYSTEM       | NTSC          |
| HD FORMAT    | 1080p/30fps   |
| EX-SDI       | OFF           |
| HD-TVI       | OFF           |
| COMM         | ↓             |
| [BACK]       | [SAVE] [DFLT] |

- ◆ **DEFECT** : Compensates for bad pixels that may occur. Occurs when the whole screen is in full black or if there is bad pixelation and it changes the THRS values until the screen is fixed.
- ※ When you use this function, you have to block the lens for blocking lights into the lens.
- ◆ **IMAGE RANGE** : Select image bit range. (Full : 100%, Compressed : 75%)
  - ▶ **FULL, COMP, USER**↓
    - ▷ **LEVEL** : Select user mode level (0 ~ 32)
- ◆ **SYSTEM** : Select NTSC(30/60fps) or PAL(25/50fps).
- ◆ **HD FORMAT** : Select Digital output  
(1080p/30(25)fps, 1080p/60(50)fps, 720p/30(25)fps, 720p/60(50)fps)
- ◆ **EX-SDI** : Select EX-SDI mode (OFF / ON) (※ Module type only)
- ◆ **HD-TVI** : Select HD-TVI mode (OFF / ON) (※ Module type only)
- ※ When the HD-TVI is on, you can't select 1080p/60(50)fps mode.

 OSD Menu

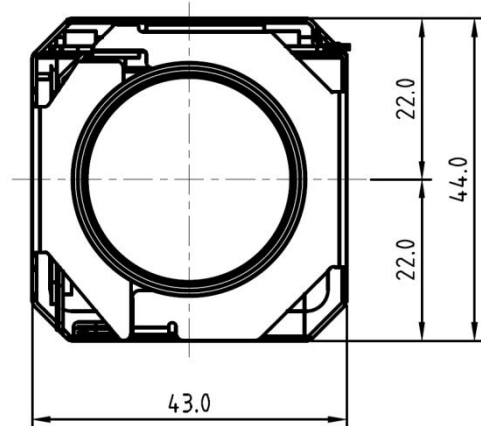
- ◆ *COMM : Set up the camera ID, baud rate, protocol*
  - ▷ *ID : Select the camera ID*
    - *1 ~ 255*
  - ▷ *BAUD RATE : Select serial communication speed*
    - *2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200bps*
  - ▷ *PROTOCOL : Select operating protocol*
    - *VISCA / PELCO-D / PELCO-P / UPDATE*


**OSD Menu**
◆ **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*

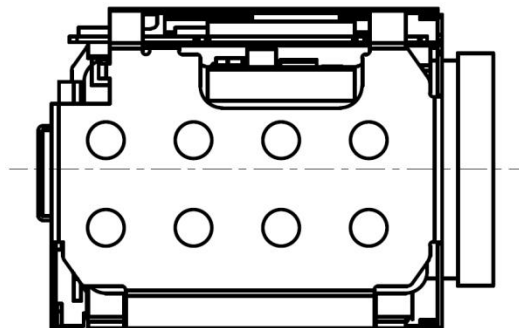
A B C D E F G H I J K L M N O P Q R S T  
 U V W X Y Z a b c d e f g h i j k l m n  
 o p q r s t u v w x y z , . ( ) { } [ ]  
 0 1 2 3 4 5 6 7 8 9 \* + - / = ~ ! ? " "

**Drawing**

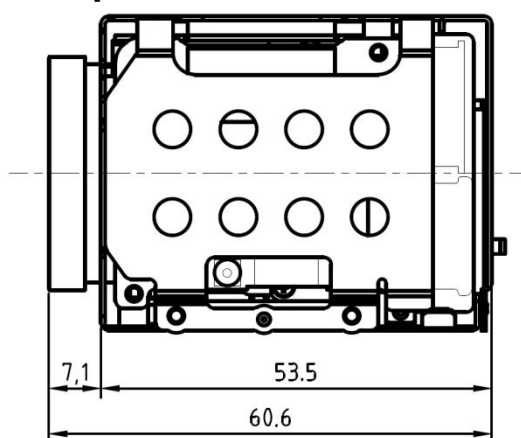
**Front**



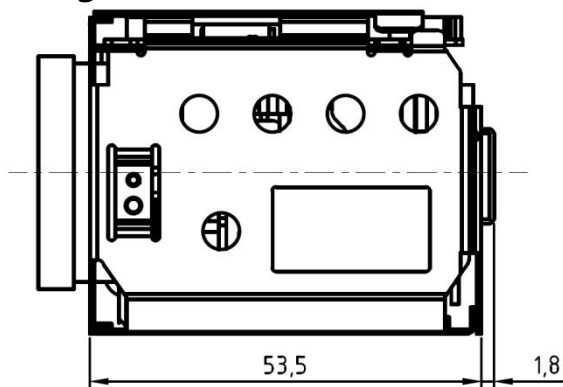
**Left side**



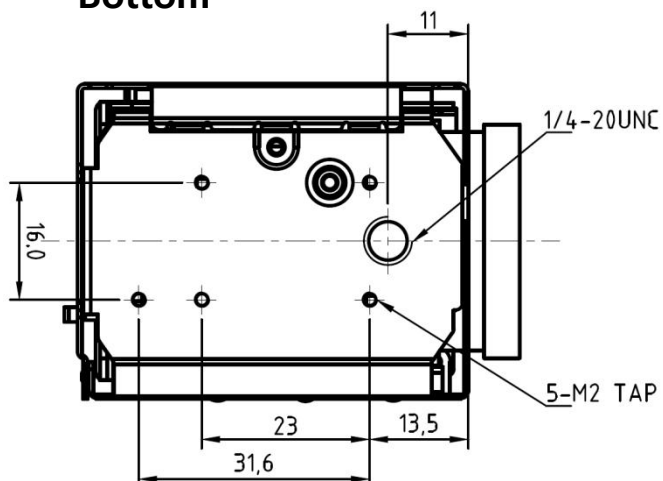
**Top**



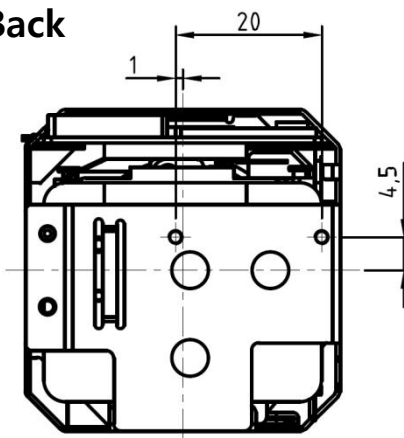
**Right side**



**Bottom**



**Back**



[illegible]