

Messrs.

DATE

09, Aug, 2018

Rev No.

1.1

# **APPROVAL SHEET**

|             |                            |
|-------------|----------------------------|
| Description | Full-HD Zoom Camera Series |
| Model Name  | VTC-Z7833H-LA/LT           |

**Receipt stamp**

|        |         |          |
|--------|---------|----------|
| Issued | Checked | Approved |
|        |         |          |

**vision***ite*

VISIONITE Inc.

# Revision History

| Date       | Rev. No | Contents                                                            |
|------------|---------|---------------------------------------------------------------------|
| 2018.06.05 | 1.0     | Release Document                                                    |
| 2018.08.09 | 1.1     | Change pin connection : CN304 (3pin → 4pin)<br>Command : DVR select |
|            |         |                                                                     |
|            |         |                                                                     |
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# FEATURES

*This Product is a high performance CCTV camera with built-in 33x optical zoom and 12x digital zoom technologies. This product can be applied to various fields such as security camera for surveillance (CCTV camera), data viewer, Video presenter(VP) and speed dome camera*

- This camera uses a 1/2.8" 2.13M Exmor R CMOS Image Sensor that supports FULL HD (high definition) to produce high-quality images.
- Using progressive scan, images with a wide dynamic range can be obtained with the newly developed image signal processor (Wide Dynamic Range function, WDR).
- The camera is equipped with a bright zoom lens with 33× optical zoom and F1.6 aperture (optical zoom + digital zoom = 396×)
- Low-noise images can be obtained even in low-light environments using the Noise Reduction function(3DNR/2DNR)
- Video signals can be output as digital only. Depending on register settings, you can select from a variety of digital output methods:  
1080p/60,1080p/50,1080p/30, 1080p/25,  
720p/60,720p/50,720p/30, 720p/25, 1080i/60,  
1080i/50
- An infrared (IR) Cut-Filter can be disengaged from the image path for increased sensitivity in low light environments. The ICR will automatically engage depending on the ambient light, allowing the camera to be effective in day/night environment.
- A Privacy Zone Masking function (max. 16 blocks) is available.

- A Motion Detection function is available.
- A title composed of up to 21 lines can be set for displaying on the screen. 30 characters can be used on one line (VISCA).
- Support 256 internal zoom/focus presets.
- Digital Image Stabilizer function reduces image blurring caused by vibration.
- Output format  
HD-SDI/EX-SDI(V1.0)/LVDS/CVBS/AHD/TVI
- LVDS output mode can be set.  
Single / Dual output



**VTC-Z7833H**  
1/2.8" Sensor

# PRECUTION

*Operation is subject to the following conditions;*

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.
- A regulated DC 12V 500mA power supply is recommended for use with this camera for the best image and the most stable operation. An unregulated power supply can cause damage to the camera. When unregulated power supply is applied, product warranty will be out of subject.
- If it is used for CVBS application. It is recommended that the camera is used with a monitor that has a CCTV quality 75 Ohm video impedance level. If your monitor is switched to high impedance then please adjust accordingly.
- Do not attempt to disassemble the camera to gain access to the internal components. Refer servicing to tour dealer.
- Never face the camera towards the sun or any bright or reflective light, which may cause smear on the image and possible damage to the CMOS.
- Do not remove the serial sticker for the warranty service.
- Do not drop the thing or give a strong impact to the product.
- Avoid the place where is so dusty, humid or soot-covered. It may cause electric shock or fire.
- Do not expose to an intense light source such as direct sunlight or spotlight. It may damage the CMOS.
- If the camera operates more than 24 hours, It is recommended that you execute the lens initial action or reset the camera.
- **Since the color representation differs depending on the DVR, you have to select the type of DVR to use in the menu.**
- **When outputting video with CVBS, DVR selection must be set to CVBS. When outputting images using AHD / TVI DVR, you must select the appropriate DVR.**

## ***Information may be changed without notice***

*This document provides technical information for the user. Visionite reserves the right to modify the information in this document as necessary. The customer should make sure that they have the most recent manual version.*

# SPECIFICATION

| Format                       | VTC-Z7833H-LA                                                       | VTC-Z7833H-LT              |
|------------------------------|---------------------------------------------------------------------|----------------------------|
| <b>Video System</b>          |                                                                     |                            |
| Image Sensor                 | 1/2.8" Exmor R CMOS (STARVIS)                                       |                            |
| Effective Pixels             | 2.13 million pixels (1945(H) x 1097(V))                             |                            |
| Output Format                | LVDS/HD-SDI/CVBS : 1080p60/50/30/25, 720p60/50/30/25, 1080i60/50    |                            |
|                              | EX-SDI: 1080p30/25, 720p60/50/30/25                                 |                            |
|                              | AHD : 1080p30/25                                                    | TVI: 1080p30/25, 720p30/25 |
| Sync System                  | Internal                                                            |                            |
| CVBS scale                   | 16:9 / 4:3 (CVBS 720H)                                              |                            |
| LVDS mode                    | Single / Dual                                                       |                            |
| Video Output                 | HD-SDI / EX-SDI(V1.0) / CVBS / LVDS                                 |                            |
|                              | HD-AHD                                                              | HD-TVI                     |
| Min. illumination            | (condition : DSS OFF, AGC28dB)                                      |                            |
| Day                          | 0.1 Lux @ F1.6                                                      |                            |
| Night (IR-cut filter on)     | 0.06 Lux @ F1.6                                                     |                            |
| S/N ratio(AGC off , DSS off) | More than 52 dB                                                     |                            |
| <b>Optical Lens</b>          |                                                                     |                            |
| Zoom Magnification           | X33                                                                 |                            |
| Practical f-value            | 4.6 to 152.0 mm                                                     |                            |
| Practical Horizontal-Angle   | 60.08°(W) ~ 2.08°(T)                                                |                            |
| Practical Vertical Angle     | 35.32°(W) ~ 1.18°(T)                                                |                            |
| Practical Diagonal Angle     | 66.10°(W) ~ 2.46°(T)                                                |                            |
| F-value                      | F1.6(W) ~ F4.8(T)                                                   |                            |
| <b>Zoom</b>                  |                                                                     |                            |
| Maximum Zoom Ratio           | x1 ~ x396                                                           |                            |
| Optical Zoom Ratio           | x1 ~ x33                                                            |                            |
| Digital Zoom Ratio           | x1 ~ x12                                                            |                            |
| Speed (Focus Tracking On)    | 4.6 ~ 40 sec                                                        |                            |
| (Focus Tracking Off)         | 3.6 sec                                                             |                            |
| <b>Focus</b>                 |                                                                     |                            |
| Control Mode                 | Auto / Manual / Interval / One Shot(=Zoom Trigger, One Push)/PRESET |                            |
| IR correction                | Standard/IR Light                                                   |                            |
| Focal Range                  | Infinity~1.5m(T)/0.1m(W)                                            |                            |
| <b>Day &amp; Night</b>       |                                                                     |                            |
| D&N mode                     | Auto / Day (Color) / Night (BW) / External-H / External-L           |                            |
| Night Color                  | Off/On                                                              |                            |
| <b>White Balance</b>         | Auto / ATW / Indoor / Outdoor / Push / Manual                       |                            |
| <b>Exposure</b>              |                                                                     |                            |
| AE mode                      | Auto / Shutter Priority / Iris Priority/ Manual/Bright              |                            |
| Brightness                   | 0~14                                                                |                            |
| AGC Limit                    | -3dB ~ 58dB                                                         |                            |
| Manual Shutter               | X32~x2, 1/25(30)/1/50(60) ~ 1/30000                                 |                            |
| Manual AGC                   | -3dB ~ 58dB                                                         |                            |
| Manual Iris                  | F1.6 ~ F19, Close                                                   |                            |
| Sens-Up                      | Off ~ 32fields                                                      |                            |
| ETC                          | Spot AE, Slow AE response                                           |                            |

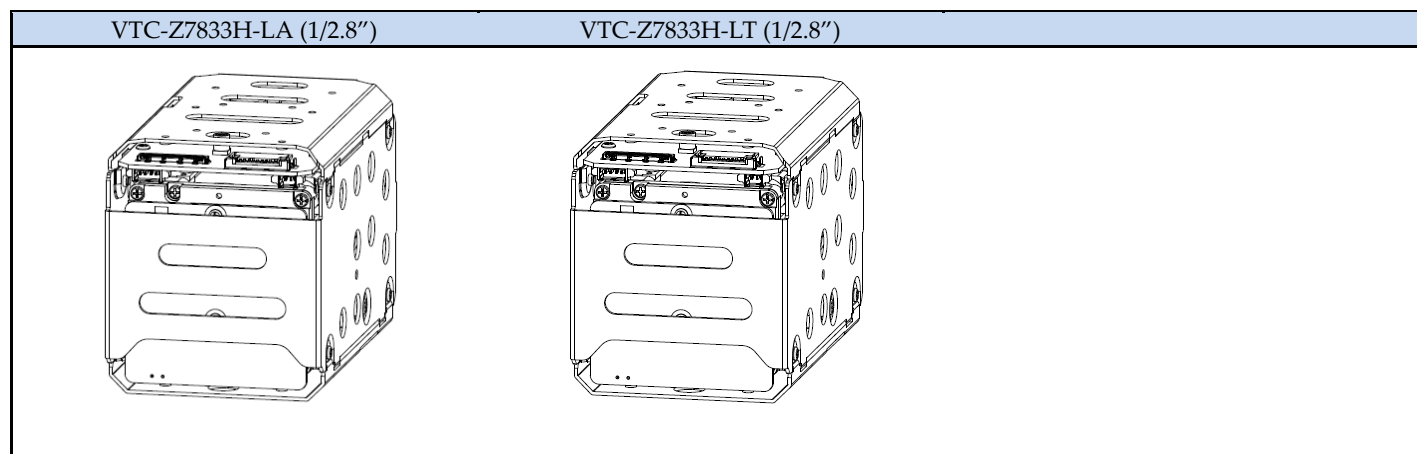
| Format                       | VTC-Z7833H-LA                                                                 | VTC-Z7833H-LT               |
|------------------------------|-------------------------------------------------------------------------------|-----------------------------|
| OSD                          | English / Japanese / Russian / Spanish / German /France/ Portuguese / Chinese |                             |
| DSP functions                |                                                                               |                             |
| Digital Slow Shutter         | Max. 32 fields                                                                |                             |
| Image Freeze                 | Off / On                                                                      |                             |
| Image Reverse (E-FLIP)       | Off / Horizontal(mirror) / Vertical / H+V(180° flip)                          |                             |
| Privacy Masking              | Spherical Privacy                                                             |                             |
|                              | - 16-zone                                                                     |                             |
|                              | - Interlock / Non-Interlock Mask                                              |                             |
|                              | - 14 mask color selectable, semi-transparency                                 |                             |
|                              | - Pan(0°~360°), Tilt(+90°~-90°)                                               |                             |
| Title Display                | 16 characters (display position selectable)                                   |                             |
| Motion Detect                | 4-Zone                                                                        |                             |
|                              | - Alarm output : OSD / Serial Communication                                   |                             |
| D-WDR                        | Off / Low/Middle/High                                                         |                             |
| WDR <sup>(NOTE1)</sup>       | WDR (Low/Middle/High)                                                         |                             |
| BLC                          | Off / On, Area selectable                                                     |                             |
| HLC                          | Off / 0 ~ 20, Color selectable                                                |                             |
| AGC                          | Max. 58dB                                                                     |                             |
| Sharpness                    | Adjustable(0~15)                                                              |                             |
| 3DNR                         | Off/On(1~5)                                                                   |                             |
| 2DNR                         | Auto/Manual(Weight High/Low)                                                  |                             |
| Defog                        | Off / Low / Middle / High                                                     |                             |
| Gamma                        | 0.45/0.50/0.55/0.60/0.65/0.70/0.75                                            |                             |
| Lens Shading                 | Off / Low / Middle / High                                                     |                             |
| Defect Detection             | Support                                                                       |                             |
| Digital Image Stabilizer     | On / Off                                                                      |                             |
| Picture Effect               | Negative/Positive, Blanck&White(Monochrome Image)                             |                             |
| Position Preset (zoom/focus) | Non-volatile 256 position(zoom/focus) presets.                                |                             |
| Memory Preset                | 16-presets & custom preset                                                    |                             |
| HD-SDI UCC                   | VTC-HZ78xxxxU model only                                                      |                             |
| HD- UTC                      | AHD UTC                                                                       | TVI UTC (PelcoC/HikvisionC) |
| Communication (UART)         |                                                                               |                             |
| Camera ID                    | 0~255                                                                         |                             |
| Remote Control               | RS-232 TTL +5.0V (+3.3V Compatible) / RS485                                   |                             |
| Control Protocol             | VISCA /Pelco-D/Pelco-P/HITACHI : automatically detection                      |                             |
| Communication Speed          | 2400/4800/9600(default)/19200/38400/57600/115200bps selectable                |                             |
| Power                        |                                                                               |                             |
| Supply Voltage               | DC 12V (+7.0V ~ +15V)                                                         |                             |
| Supplied Current(motor on)   | 260mA(430mA)                                                                  |                             |
| Consumption (motor on)       | 3.2W(5.2W)                                                                    |                             |
| Physical                     |                                                                               |                             |
| Dimension (WxHxD) [mm]       | 50.0x58.8x95.8                                                                |                             |
| Weight                       | 260g                                                                          |                             |
| Temperature& Humidity        |                                                                               |                             |
| Operating condition          | Temperature (-10°C~50 °C / 14°F~122°F), Humidity (20% ~ 80%)                  |                             |
| Storage condition            | Temperature (-20°C~60 °C / -4°F~140°F), Humidity (20% ~ 95%)                  |                             |

<sup>(NOTE1)</sup> When CVBS is connected, WDR automatically turns off and Digital WDR operates.

## INTERFACE SUMMARY

| Interface & Video |                                             | VTC-Z7833H-LA | VTC-Z7833H-LT |
|-------------------|---------------------------------------------|---------------|---------------|
| Video Output      | EX-SDI (V1.0)                               | O             | O             |
|                   | HD-SDI                                      | O             | O             |
|                   | HD-TVI                                      |               | O             |
|                   | HD-AHD                                      | O             |               |
|                   | CVBS                                        | O             | O             |
|                   | LVDS                                        | ⊙             | ⊙             |
| Interface         | 30pin Micro Coaxial<br>(USL00-30L-C, 0.4mm) | ⊙             | ⊙             |
|                   | 24pin FFC<br>(SFV24R-1STE1HLF, 0.55mm)      |               |               |
|                   | 9pin FFC<br>(52207-0985, 1.0mm)             | O             | O             |
|                   | 3pin External D&N<br>(SM03B-SRSS-TB, 1.0mm) | O             | O             |
|                   | 4pin AHD/TVI<br>(53261-0471, 1.25mm)        | O             | O             |
|                   | 2pin RS-485<br>(53261-0271, 1.25mm)         | O             | O             |
|                   | MMCX                                        | O             | O             |

⊙ : Main Video Output / Main Control Connector

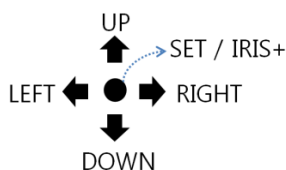




# OSD & MENU

## MAIN MENU

|               |     |
|---------------|-----|
| FOCUS         | [←] |
| EXPOSURE      | [←] |
| WHITE BALANCE | [←] |
| WDR/BLC       | [←] |
| DAY&NIGHT     | [←] |
| IMAGE         | [←] |
| SPECIAL       | [←] |
| FACTORY DEF   | OK  |
| EXIT          |     |



UP/DOWN : move cursor

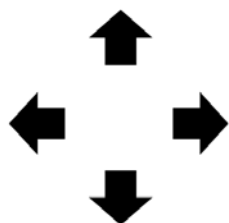
LEFT/RIGHT : change data, enter to submenu

SET (or IRIS OPEN) : used for SET key

► FACTORY DEF : factory default setting

It changes the entire menu in the initial state except "SYSTEM" menu items.

## SIZE & POSITION



RETURN : [SET] KEY

Adjust SIZE or POSITION.

- CAM TITLE POSITION MENU
- CAM ID POSITION MENU
- ZOOM MAG POSITION MENU
- PRIVACY MASK PAN/TILT POSITION MENU
- PRIVACY MASK SIZE MENU
- FOCUS PRESET POSITION SETTING MENU

## FOCUS

|                 |      |
|-----------------|------|
| AF MODE         | AUTO |
| D-ZOOM          | ON   |
| ZOOM START      | x1   |
| ZOOM STOP       | x120 |
| ZOOM SPEED      | 6    |
| FOCUS LIMIT     | 1M   |
| AF INTERVAL     | 1min |
| HOME POSITION   | OFF  |
| PRESET POSITION | [←]  |
| PRESET MARGIN   | 10   |
| INITIAL         | OK   |
| RETURN          |      |

Setting Zoom/Focus function

- AF MODE : AUTO/ONE SHOT/INTERVAL/MAMUAL/PRESET
  - DIGITAL ZOOM : OFF/ON
  - ZOOM START/STOP
  - ZOOM SPEED : 0~7
  - FOCUS LIMIT : 10CM~INF, focus near limit.
  - AF INTERVAL :1min~10min  
Auto Focus interval when AF INTERVAL mode
  - HOME POSITION : OFF/ON  
Go to X1 position when power on.
  - PRESET POSITION : Select target position for PRESET AF
  - PRESET : Select PRESET auto focusing range, 4~255
- (\*)See. "FUNCTIONS"

## EXPOSURE

**AE MODE** **AUTO**  
**FLICKERLESS** **OFF**  
**IRIS** **F4.8**  
**SHUTTER** **1/30**  
**AGC** **32dB**  
**AGC MAX** **32dB**  
**SENS UP** **X32**  
**BRIGHTNESS** **8**  
**INITIAL** **OK**  
**RETURN**

Setting Auto Exposure function.

► AE MODE : AUTO/IRIS.P/SHUT.P/MANUAL

| MODE        | AUTO | IRIS.P | SHUT.P | MANUAL |
|-------------|------|--------|--------|--------|
| FLICKERLESS | O    | X      | X      | X      |
| IRIS        | X    | O      | X      | O      |
| SHUTTER     | X    | X      | O      | O      |
| AGC         | X    | X      | X      | O      |
| AGC MAX     | O    | O      | O      | X      |
| SENS UP     | O    | O      | O      | O      |
| WDR         | O    | X      | X      | X      |

► IRIS : F1.2~CLOSE, Select Manual Iris Value

► SHUTTER : X32~X2,1/30,~,1/30000, Manual Shutter Speed

► AGC : -3dB~58dB, Manual Gain Value

► AGC MAX : -3dB ~ 58dB, AGC maximum rate

► SENS UP : OFF,X2,X4,X8,X16,X32, Slow Shutter value

► BRIGHTNESS : 1~14, Image Brightness

## WHITE BALANCE

**WB MODE** **AUTO**  
**PUSH AUTO** **[ 1/2 ]**  
**COLOR GAIN** **5**  
**RED GAIN** **10**  
**BLUE GAIN** **10**  
**INITIAL** **OK**  
**RETURN**

Setting Auto White Balance Function.

► WB MODE :

AUTO/INDOOR/OUTDOOR/ATW/ONE PUSH/MANUAL

AUTO : Automatically adjusts color

INDOOR / OUTDOOR : Set color temperature to be indoor/outdoor light

ATW : Auto Trace White balance

ONE-PUSH : fix the color if pressed PUSH button

MANUAL : Adjust color manually.

► PUSH AUTO : if WB mode is ONE PUSH

► COLOR GAIN : 0~20, adjust chroma gain

► RED/BLUE GAIN : 0~255, adjust manual Red/Blue gain

## WDR/BLC

**MODE** **BLC**  
**LEVEL** **5**  
**BLC X-POSITION** **7**  
**BLC Y-POSITION** **6**  
**BLC X-SIZE** **4**  
**BLC Y-SIZE** **5**  
**COLOR** **BLACK**  
**INITIAL** **OK**  
**RETURN**

Setting WDR/BLC/HLC function

► WDR/BLC MODE : OFF/BLC/HLC/WDR

BLC : Backlight Compensation mode

HLC : Highlight Compensation mode

WDR : Wide Dynamic Range mode

► LEVEL : adjust HLC/WDR Level

HLC : 0~20

WDR : LOW/MIDDLE/HIGH

► BLC X- POSITION : adjust BLC X-window position

► BLC Y- POSITION : adjust BLC Y-window position

► BLC X-SIZE : adjust BLC X-window size

► BLC Y-SIZE : adjust BLC Y-window size

► HLC COLOR : BLACK/WHITE/YELLOW/CYAN/GREEN/MAGENTA/  
RED/BLUE

◆ (Caution !!!)

WDR is available if AE MODE is AUTO.

## DAY&NIGHT

|            |      |
|------------|------|
| MODE       | AUTO |
| DWELL TIME | 5sec |
| DAY->NIGHT | 28   |
| NIGHT->DAY | 4    |
| IR SMART   | 0    |
| INITIAL    | OK   |
| RETURN     |      |

### Setting Day&Night Function

- ▶ MODE : AUTO/DAY/NIGHT/EXT-H/EXT-L
- ▶ DWELL TIME : 0~20sec
- ▶ DAY->NIGHT : 1~28
- ▶ NIGHT->DAY : 0~27
- ▶ NIGHT COLOR : BW/COLOR  
Select color at night condition.
- ▶ IR SMART : 0~20

## IMAGE

|           |      |
|-----------|------|
| SHARPNESS | 8    |
| GAMMA     | 0.50 |
| MIRROR    | OFF  |
| FREEZE    | OFF  |
| D-WDR     | OFF  |
| DEFOG     | [↔]  |
| DNR       | [↔]  |
| DIS       | [↔]  |
| EFFECT    | [↔]  |
| INITIAL   | OK   |
| RETURN    |      |

### Setting Image Function

- ▶ SHARPNESS : 0~15
- ▶ GAMMA : 0.45/0.50/0.55/0.60/0.65/0.70/0.75
- ▶ MIRROR : OFF/H-MIR/V-MIR/HV-MIR
- ▶ FREEZE : OFF/ON
- ▶ D-WDR : OFF/LOW/MIDDLE/HIGH
- ▶ Defog : Setting Defog
- ▶ DNR : Setting Digital Noise Reduction
- ▶ DIS : Setting Digital Image Stabilization
- ▶ EFFECT : Setting Digital Effects

## DEFOG

|             |        |
|-------------|--------|
| MODE ON/OFF | ON     |
| MODE        | AUTO   |
| LEVEL       | MIDDLE |
| RETURN      |        |

### Setting Defog

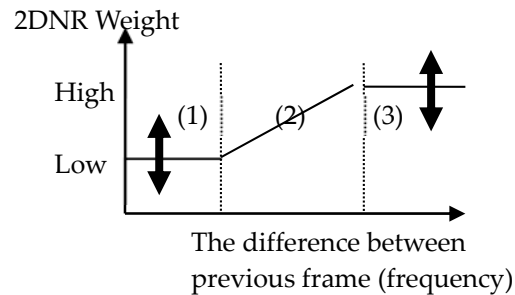
- ▶ MODE ON/OFF : OFF/ON
- ▶ MODE : AUTO/MANUAL
- ▶ LEVEL : LOW/MIDDLE/HIGH

## DNR

**3DNR** 1  
**2DNR MODE** AUTO  
**2DNR WEIGHT-H** 250  
**2DNR WEIGHT-L** 0  
**RETURN**

### Setting Digital Noise Reduction

- ▶ 3DNR : OFF/1~5, 3DNR weight
- ▶ 2DNR MODE : AUTO/MANUAL
- ▶ 2DNR WEIGHT-H : 2DNR MANUAL High frequency weight
- ▶ 2DNR WEIGHT-L : 2DNR MANUAL Low frequency weight



- (1) Low frequency area
- (2) Excluded area when 2DNR manual mode
- (3) High frequency area

## DIS

**MODE** OFF  
**RANGE** 30%  
**FILTER** MIDDLE  
**AUTO C** HALF  
**RETURN**

### Setting Digital image stabilization

- ▶ MODE : OFF/ON
- ▶ RANGE : 10%/20%/30%
- ▶ FILTER : LOW/MIDDLE/HIGH
- ▶ AUTO C : OFF/HALF/FULL

## EFFECT

**PIC.EFFECT** OFF  
**HR MODE** OFF  
**RETURN**

### Setting Digital Effect function

- ▶ PIC.EFFECT : OFF/NEGATIVE/BW
- ▶ HR MODE : OFF/ON  
High Resolution mode

## SPECIAL

|           |     |
|-----------|-----|
| CAM TITLE | [←] |
| DISPLAY   | [←] |
| PRIVACY   | [←] |
| MOTION    | [←] |
| SYSTEM    | [←] |
| INITIAL   | OK  |
| RETURN    |     |

### Setting Special Functions

- ▶ CAM TITLE : edit camera title
- ▶ DISPLAY : select display mode
- ▶ PRIVACY : adjust privacy mask status
- ▶ MOTION : adjust motion detect function
- ▶ SYSTEM : system setting
- ▶ INITIAL : (!!!) *SYSTEM menu is NOT initialized.*

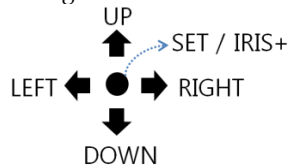
## CAM TITLE

↓  
TITLE: \_ \_ \_ \_ \_

ABCDEFGHIJKLMN  
OPQRSTUVWXYZ! - ( ) [ ]  
0123456789? \* : " / .  
SPA>> <<BAK

|          |     |
|----------|-----|
| DISPLAY  | OFF |
| LOCATION | ←   |
| RETURN   |     |

### Setting Camera Title



[ Title Edit ]

UP/DOWN : move cursor up&down

LEFT/RIGHT : move cursor left&right

SET (or IRIS OPEN) : select cursor character.

- ▶ DISPLAY : OFF/ON, enable/disable title display
- ▶ LOCATION : adjust TITLE display position

## DISPLAY

|               |    |
|---------------|----|
| CAM ID DISP   | ON |
| CAM ID POS    | ←  |
| ZOOM MAG DISP | ON |
| ZOOM MAG POS  | ←  |
| INITIAL       | OK |
| RETURN        |    |

### Setting On Screen Display

- ▶ CAM ID DISP : OFF/ON, Camera ID display mode
- ▶ CAM ID POS : Camera ID display position setting
- ▶ ZOOM MAG DISP : OFF/ON
- ▶ ZOOM MAG POS : Zoom ration display position setting

## PRIVACY

|              |       |
|--------------|-------|
| MODE         | ON    |
| ZONE NO      | 1     |
| DISPLAY      | ON    |
| P/T LOCK     | ON    |
| POSITION     | ON    |
| ZONE SIZE    | ↩     |
| COLOR        | BLACK |
| TRANSPARENCY | 25%   |
| ZONE RESET   | ↩     |
| INITIAL      | OK    |
| RETURN       |       |

### Setting Spherical Privacy mask

- ▶ MODE : OFF/ON, Privacy mask enable/disable
- ▶ ZONE NO : 1~24, Privacy mask zone number
- ▶ ZONE DISPLAY : OFF/ON, current mask zone display on/off.
- ▶ P/T INTERLOCK : interlocking Pan&Tilt.
- ▶ POS.ZOOM : select zoom position.  
[LEFT] zoom out, [RIGHT] zoom in
- ▶ POS.PAN/TILT : select pan/tilt position.(if P/T INTERLOCK OFF)
- ▶ ZONE SIZE : select mask zone width&height.
- ▶ COLOR : select mask zone color, BLACK,GRAY1~6,WHITE,RED, GREEN,BLUE,CYAN,YELLOW,MAGENTA
- ▶ TRANSPARENCY : select transparent level. OFF/25%/50%/75%
- ▶ ZONE RESET : reset the mask size, zoom, pan, tilt postion.

## MOTION

|             |        |
|-------------|--------|
| MODE        | ON     |
| ZONE NO     | 1      |
| ZONE DETECT | ON     |
| X-POSITION  | 1      |
| Y-POSITION  | 1      |
| X-SIZE      | 58     |
| Y-SIZE      | 32     |
| SENSITIVITY | MIDDLE |
| ALARM MODE  | TEXT   |
| INITIAL     | OK     |
| RETURN      |        |

### Setting Motion Detect

- ▶ MODE : OFF/ON, Enable/disable the Motion Detection.
- ▶ ZONE NO : 1~4, select the motion detection window.
- ▶ ZONE DETECT : OFF/ON, select the detection mode of current zone.
- ▶ X-POSITION : adjust motion detect zone X-position.
- ▶ Y-POSITION : adjust motion detect zone Y-position.
- ▶ X-SIZE : adjust motion detect zone X-size.
- ▶ Y-SIZE : adjust motion detect zone Y-size.
- ▶ SENSITIVITY : 0~10, select the motion detect sensitivity level.
- ▶ ALARM MODE: OFF/OSD/TEXT/OSD+TEXT, select the display method if motion is detected.

## SYSTEM

|            |          |
|------------|----------|
| LANGUAGE   | ENGLISH  |
| FRAMERATE  | 1080_60p |
| DVR        | STANDARD |
| APPLY      | [ F4 ]   |
| CVBS       | 16:9     |
| LVDS MODE  | SINGLE   |
| IR LED     | NO       |
| DEFECT DET | [ F4 ]   |
| COLOR      | [ F4 ]   |
| COM        | [ F4 ]   |
| RETURN     |          |

### Setting System Function

- ▶ LANGUAGE : English / Japanese / Russian / Spanish / German /France/ Portuguese/ Chinese
- ▶ FRAMERATE : 1080\_60p/1080\_50p/1080\_30p/1080\_25p/ 720\_60p/720\_50p/720\_30p/720\_25p/1080\_60i/1080\_50i
- ▶ DVR : Select DVR model. (\*) See. "Supported DVRs"
- ▶ APPLY : apply the <FRAMERATE>,<DVR> settings.

*Two messages are output when APPLY is executed.  
The first message is a message that is output before the status is changed, and the second message is a message that is output after the status is changed.  
If the status is changed, the image may not be output. In this case, if you wait 20 seconds without any keystroke, it will be restored to its original state.*

- ▶ CVBS : 16:9 / 4:3, select CVBS scale
- ▶ LVDS MODE : SINGLE/DUAL(=double)
- ▶ IR LED : YES(use IR LED at night) /NO
- ▶ DEFECT DET : defect detection
- ▶ COLOR : Adjust R/B gain, R/B hue
- ▶ COM : RS232 / RS485 communication Setting.

**(!!!) All of the SYSTEM menu items are NOT initialized.**

## COLOR

```

BY_GAIN-      80
BY_GAIN+      58
RY_GAIN-      68
RY_GAIN+      44
BY_HUE-       224
BY_HUE+       232
RY_HUE-       0
RY_HUE+      128
RED GAIN      60
GREEN GAIN    50
BLUE GAIN     60
RESET        ↵
RETURN

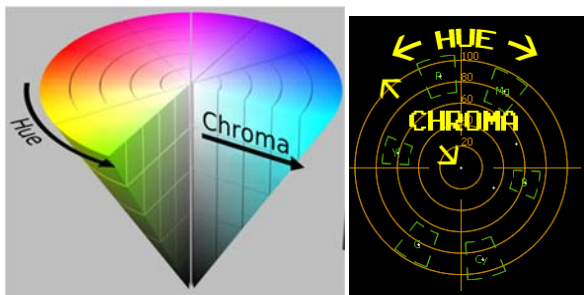
```

## Adjust Color Gain

► BY-GAIN ~ RY\_HUE, R/G/B-GAIN : adjust color

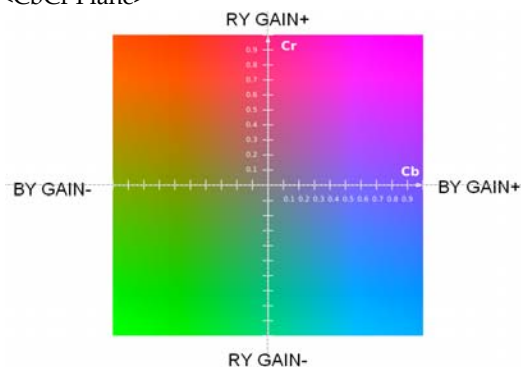
GAIN : Chroma (saturation) value

HUE : Hue



(!!!) These values are NOT initialized.

## <CbCr Plane>



(f.g) If you want to emphasize the GREEN color, adjust BY-GAIN- and RY-GAIN-.

## COM

```

CAM ID        1
BAUDRATE      9600
APPLY         ↵
RETURN

```

## Setting Serial Interface

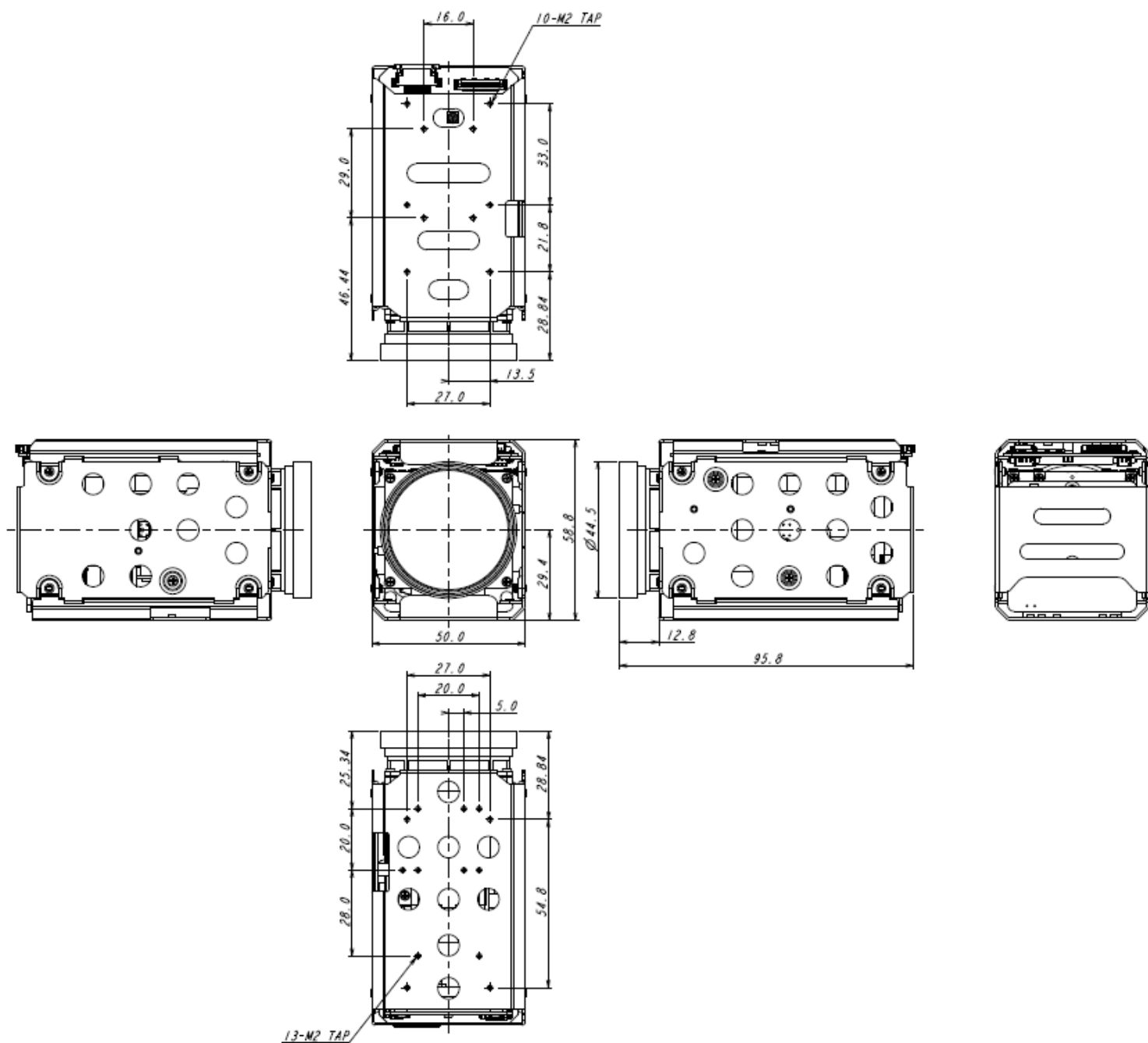
► CAM ID : 0~255

► BAUDRATE: 2400/4800/9600/19200/38400/57800/115200 bps

► APPLY : apply the <CAM ID>,<BAUDRATE> condition.

# DIMENSION

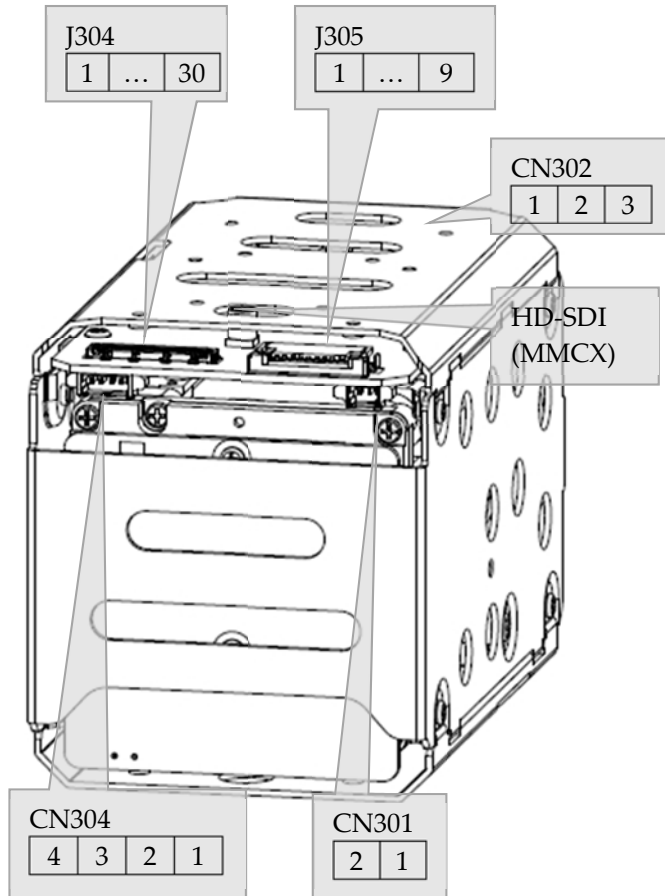
## Zoom module (VTC-Z7833H-LA/LT)





# INTERFACE

## PIN Assign (VTC-Z7833H-LA 1/2.8")



### J305 / Molex 52207-0985

| NO | Name    | Description                  |
|----|---------|------------------------------|
| 1  | GND     | (Optional RS485EN or AD KEY) |
| 2  | AHD_OUT | HD-AHD OUTPUT                |
| 3  | GND     |                              |
| 4  | CVBS    | CVBS OUTPUT                  |
| 5  | GND     |                              |
| 6  | DC_IN   | DC12V input                  |
| 7  | GND     |                              |
| 8  | TXD     | 5.0V (compatible 3.3V)       |
| 9  | RXD     | 5.0V (compatible 3.3V)       |

### J304 (Micro Co-Axial) / KEL Co. USL00-30L-C

| NO | Name       | Description                 |
|----|------------|-----------------------------|
| 1  | TX_OUT3+   |                             |
| 2  | TX_OUT3-   |                             |
| 3  | TX_CLKOUT+ |                             |
| 4  | TX_CLKOUT- |                             |
| 5  | TX_OUT2+   |                             |
| 6  | TX_OUT2-   |                             |
| 7  | TX_OUT1+   |                             |
| 8  | TX_OUT1-   |                             |
| 9  | TX_OUT0+   |                             |
| 10 | TX_OUT0-   |                             |
| 11 | GND        |                             |
| 12 | TXD        | 5.0V (compatible 3.3V)      |
| 13 | RXD        | 5.0V (compatible 3.3V)      |
| 14 | +12V DC    |                             |
| 15 | +12V DC    |                             |
| 16 | +12V DC    |                             |
| 17 | +12V DC    |                             |
| 18 | +12V DC    |                             |
| 19 | GND        |                             |
| 20 | GND        |                             |
| 21 | TX_OUT7+   | Single out mode : open      |
| 22 | TX_OUT7-   | Single out mode : open      |
| 23 | TX_OUT6+   | Single out mode : open      |
| 24 | TX_OUT6-   | Single out mode : open      |
| 25 | CVBS       | CVBS output                 |
| 26 | RESET_IN   | Reset:Low(GND),Normal(1.8V) |
| 27 | TX_OUT5+   | Single out mode : open      |
| 28 | TX_OUT5-   | Single out mode : open      |
| 29 | TX_OUT4+   | Single out mode : open      |
| 30 | TX_OUT4-   | Single out mode : open      |

### CN302 (External D&N) / JST : SM03B-SRSS-TB

| NO | Name    | Description            |
|----|---------|------------------------|
| 1  | Ext_D&N | External D&N Input     |
| 2  | GND     |                        |
| 3  | +3.3V   | +3.3V Out (For Sensor) |

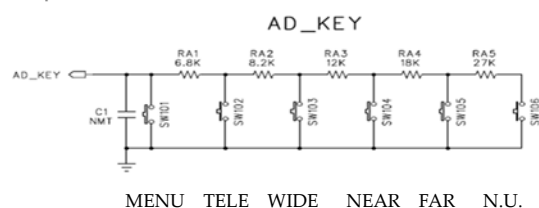
### CN304 (AHD) / 53261-0471

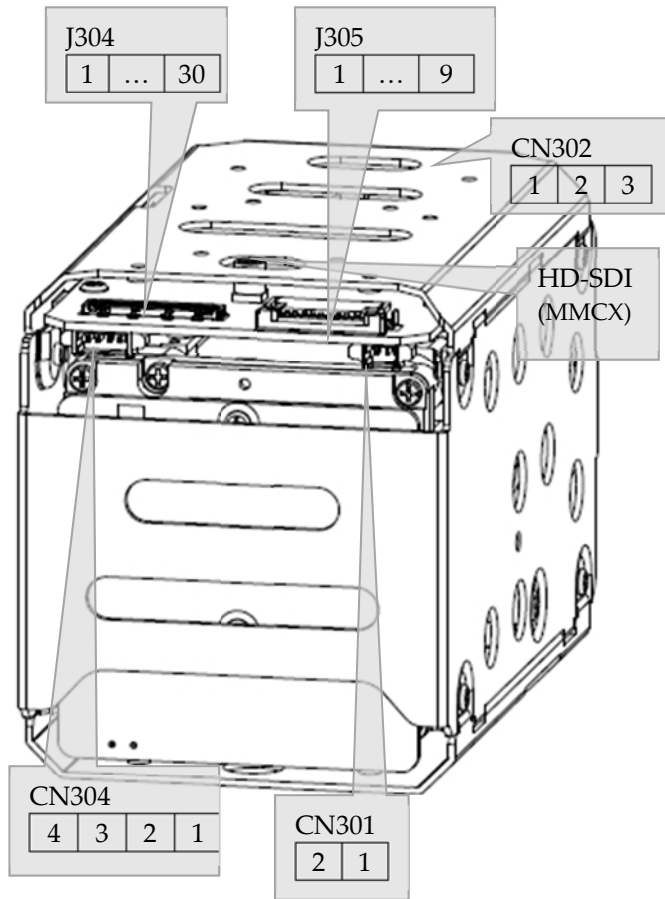
| NO | Name    | Description   |
|----|---------|---------------|
| 1  | +12V_IN | DC 12V INPUT  |
| 2  | GND     | GND (DC 12V)  |
| 3  | AHD_OUT | HD-AHD output |
| 4  | GND     | GND (HD-AHD)  |

### CN301 (RS485) / 53261-0271

| NO | Name | Description |
|----|------|-------------|
| 1  | TRX+ | RS485 TRX+  |
| 2  | TRX- | RS485 TRX-  |

(AD key External Circuit)





#### J305 / Molex 52207-0985

| NO | Name    | Description                  |
|----|---------|------------------------------|
| 1  | GND     | (Optional RS485EN or AD KEY) |
| 2  | TVI_OUT | HD-TVI OUTPUT                |
| 3  | GND     |                              |
| 4  | CVBS    | CVBS OUTPUT                  |
| 5  | GND     |                              |
| 6  | DC_IN   | DC12V input                  |
| 7  | GND     |                              |
| 8  | TXD     | 5.0V (compatible 3.3V)       |
| 9  | RXD     | 5.0V (compatible 3.3V)       |

#### J304 (Micro Co-Axial) / KEL Co. USL00-30L-C

| NO | Name       | Description                 |
|----|------------|-----------------------------|
| 1  | TX_OUT3+   |                             |
| 2  | TX_OUT3-   |                             |
| 3  | TX_CLKOUT+ |                             |
| 4  | TX_CLKOUT- |                             |
| 5  | TX_OUT2+   |                             |
| 6  | TX_OUT2-   |                             |
| 7  | TX_OUT1+   |                             |
| 8  | TX_OUT1-   |                             |
| 9  | TX_OUT0+   |                             |
| 10 | TX_OUT0-   |                             |
| 11 | GND        |                             |
| 12 | TXD        | 5.0V (compatible 3.3V)      |
| 13 | RXD        | 5.0V (compatible 3.3V)      |
| 14 | +12V DC    |                             |
| 15 | +12V DC    |                             |
| 16 | +12V DC    |                             |
| 17 | +12V DC    |                             |
| 18 | +12V DC    |                             |
| 19 | GND        |                             |
| 20 | GND        |                             |
| 21 | TX_OUT7+   | Single out mode : open      |
| 22 | TX_OUT7-   | Single out mode : open      |
| 23 | TX_OUT6+   | Single out mode : open      |
| 24 | TX_OUT6-   | Single out mode : open      |
| 25 | CVBS       | CVBS output                 |
| 26 | RESET_IN   | Reset:Low(GND),Normal(1.8V) |
| 27 | TX_OUT5+   | Single out mode : open      |
| 28 | TX_OUT5-   | Single out mode : open      |
| 29 | TX_OUT4+   | Single out mode : open      |
| 30 | TX_OUT4-   | Single out mode : open      |

#### CN302 (External D&N) / JST : SM03B-SRSS-TB

| NO | Name    | Description            |
|----|---------|------------------------|
| 1  | Ext_D&N | External D&N Input     |
| 2  | GND     |                        |
| 3  | +3.3V   | +3.3V Out (For Sensor) |

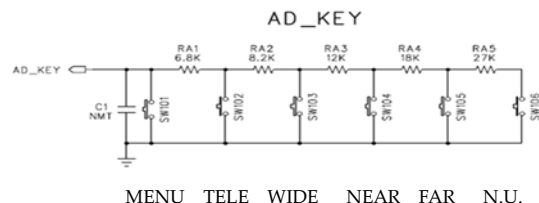
#### CN304 (TVI) / 53261-0471

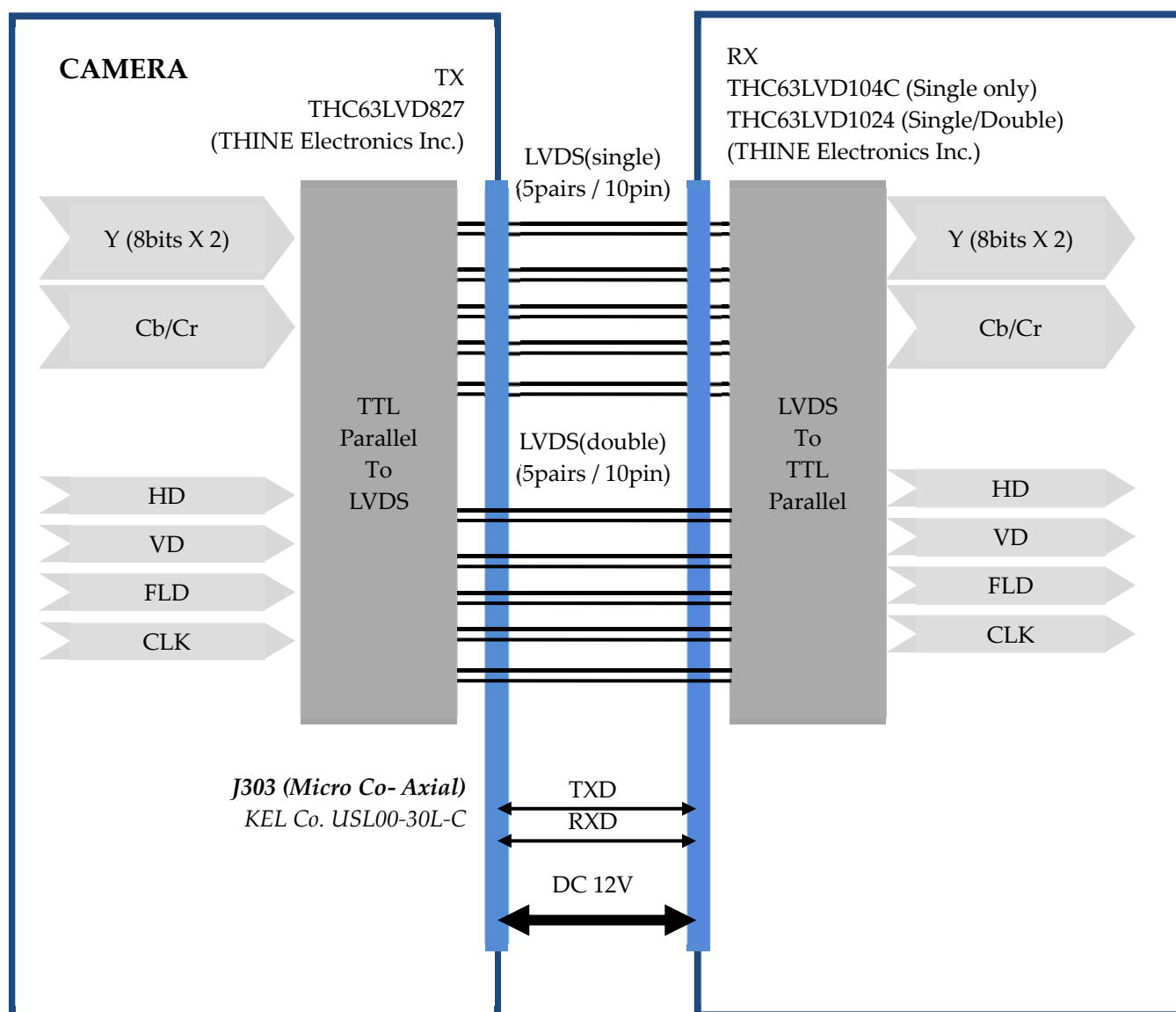
| NO | Name    | Description   |
|----|---------|---------------|
| 1  | +12V_IN | DC 12V INPUT  |
| 2  | GND     | GND (DC 12V)  |
| 3  | TVI_OUT | HD-TVI output |
| 4  | GND     | GND (HD-TVI)  |

#### CN301 (RS485) / 53261-0271

| NO | Name | Description |
|----|------|-------------|
| 1  | TRX+ | RS485 TRX+  |
| 2  | TRX- | RS485 TRX-  |

(AD key External Circuit)





HD Digital Video Sync Signal  
74.125MHz

Recommended LVDS receiver IC  
(1) Single Only : THC63LVD104C  
(2) Single or Double : THC63LVD1024

## Select LVDS output mode

### (1) MENU

SPECIAL -> SYSTEM -> LVDS MODE : SINGLE/DUAL

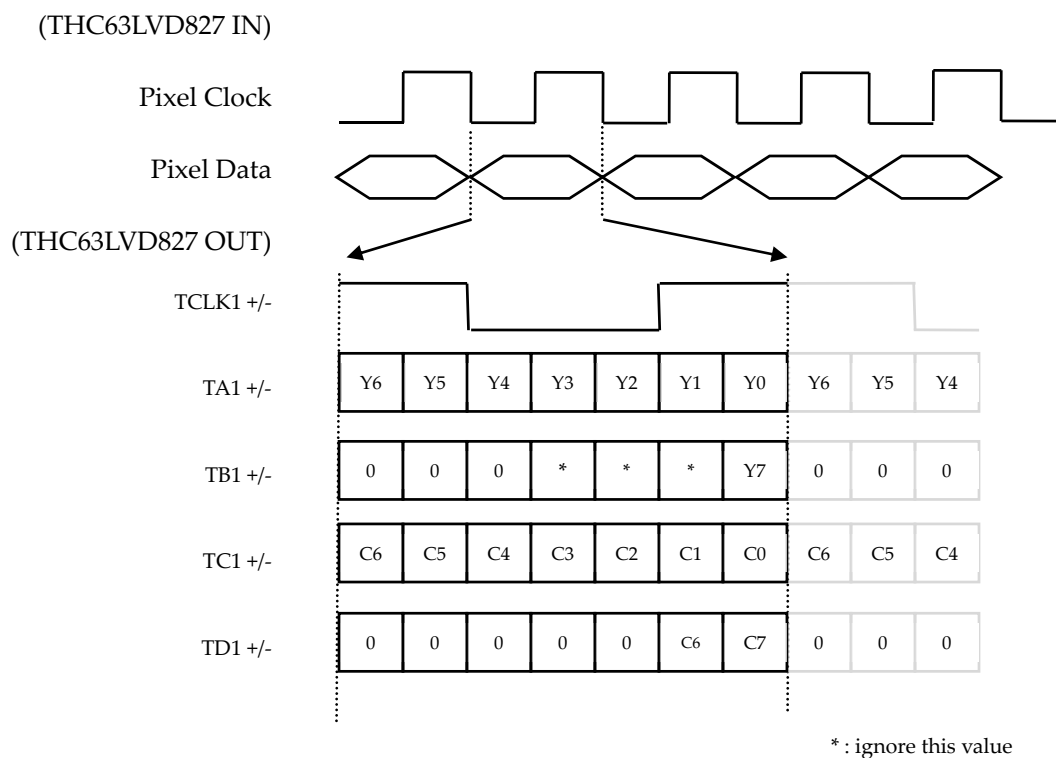
### (2) VISCA protocol

8x 01 04 24 74 0p 0q FF : pq=00 (single) / pq=01 (double)

(caution) If the frame rate is 25 fps / 30 fps, it works as SINGLE even if LVDS MODE is set to DUAL.

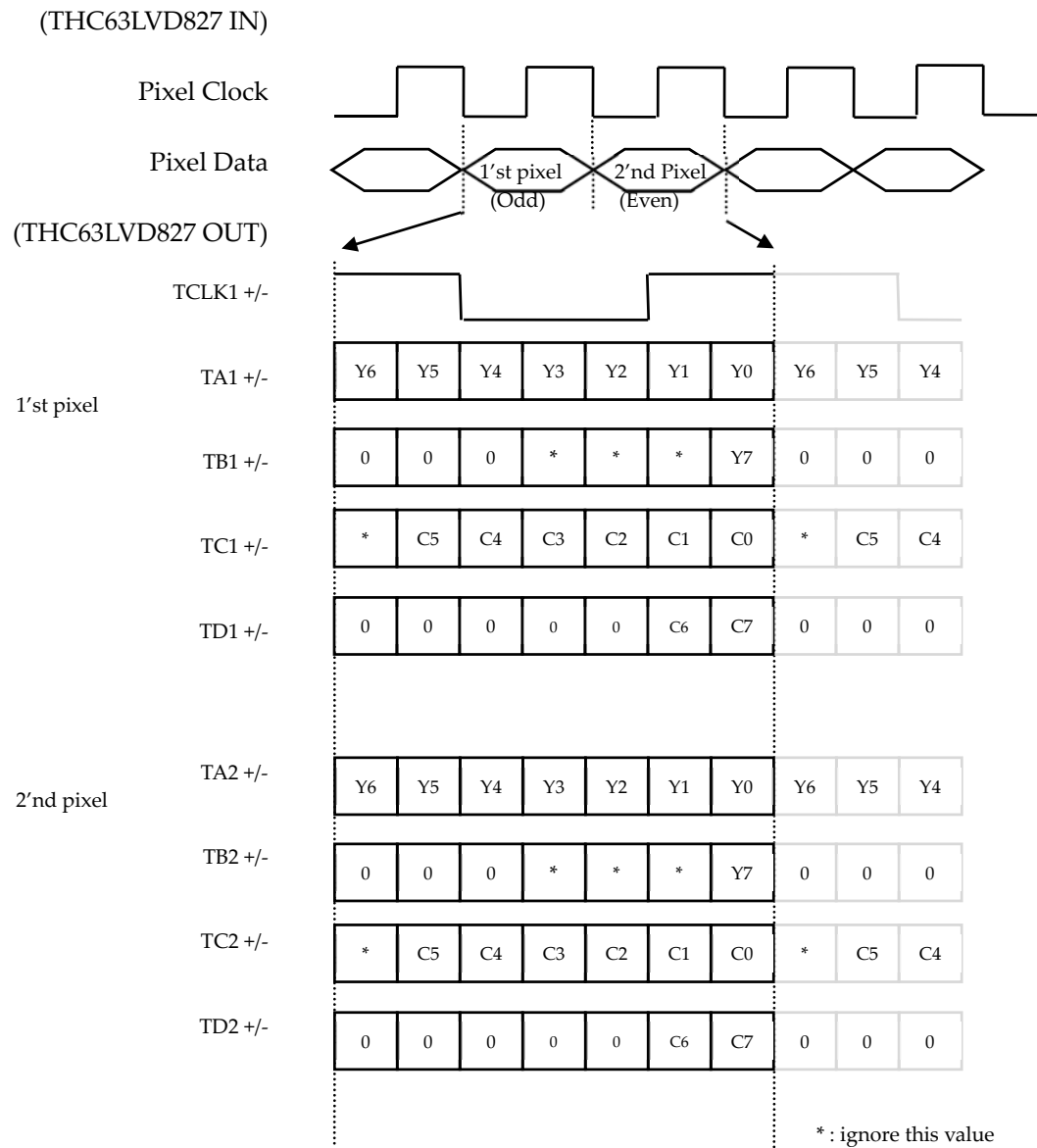
However, if the frame rate is 50 fps / 60 fps, LVDS MODE must be set to DUAL to operate as DUAL.

**Single Mode : THC63LVD827 (THINE Electronics Inc.)**



| Output Format | Pixel Clock [MHz] | TCLK+ [MHz] |
|---------------|-------------------|-------------|
| 1080p60       | 148.5             | 148.5       |
| 1080p50       | 148.5             | 148.5       |
| 1080i60       | 74.25             | 74.25       |
| 1080i50       | 74.25             | 74.25       |
| 1080p30       | 74.25             | 74.25       |
| 1080p25       | 74.25             | 74.25       |
| 720p60        | 74.25             | 74.25       |
| 720p50        | 74.25             | 74.25       |
| 720p30        | 74.25             | 74.25       |
| 720p25        | 74.25             | 74.25       |

## Double Mode : THC63LVD827 (THINE Electronics Inc.)



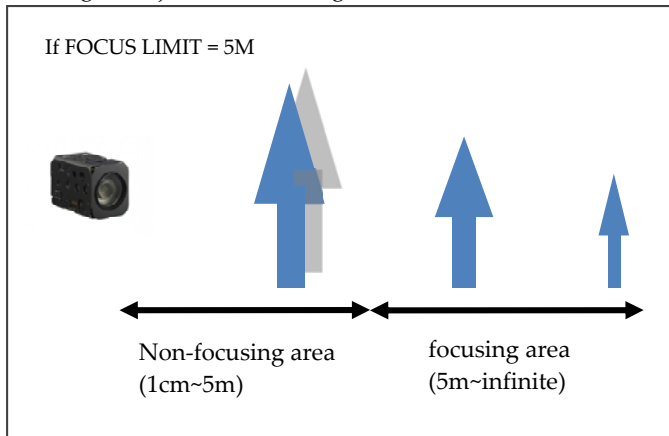
| Output Format | Pixel Clock [MHz] | TCLK+ [MHz] |
|---------------|-------------------|-------------|
| 1080p60       | 148.5             | 74.25       |
| 1080p50       | 148.5             | 74.25       |
| 1080i60       | 74.25             | 37.125      |
| 1080i50       | 74.25             | 37.125      |
| 1080p30       | 74.25             | 37.125      |
| 1080p25       | 74.25             | 37.125      |
| 720p60        | 74.25             | 37.125      |
| 720p50        | 74.25             | 37.125      |
| 720p30        | 74.25             | 37.125      |
| 720p25        | 74.25             | 37.125      |

# FUNCTIONS

## Auto Focus Near Limit

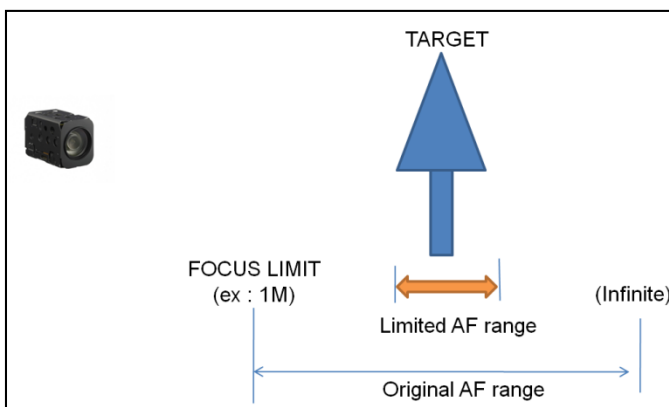
You can set the minimum focus distance from 1cm(or 10cm) to infinite. It is available only at high magnification zoom position.

This is called by FOCUS LIMIT or NEAR LIMIT or M.O.D (Minimum object distance). This is mostly used to avoid focusing on objects of close range.



## Auto Focus Mode

- **AUTO**  
When a change in the image is detected, the AF operation is automatically performed.
- **INTERVAL**  
It is used for AF movements carried out at particular intervals.
- **MANUAL**  
Adjust zoom and focus manually.
- **ONESHOT**  
When the zoom is changed, auto focus is executed only once.  
The AF range is from FOCUS LIMIT to infinity.  
It is called by "ONE PUSH" or "ZOOM TRIGGER" mode.
- **PRESET**  
Always focus on the specified subject. When the zoom is changed, auto focus is executed only once. The AF range (=PRESET MARGIN) is limited to a specific range.



- The PRESET AF mode is useful when you need to focus only on objects of a specific distance that require little PAN / TILT operation after installing the camera.

- The PRESET MARGIN is the AF operating range at the maximum zoom scale. This range is automatically adjusted according to the zoom magnification

### < PRESET setting method – 1 >

- (1) Enter MENU
- (2) Change AF mode to PRESET
- (3) Enter PRESET POSITION menu
- (4) Move to maximum zoom scale (OK is displayed on the screen)
- (5) Adjust focus
- (6) Exit PRESET POSITION menu
- (7) Adjust PRESET MARGIN data (4~255)



### < PRESET setting method – 2 >

|             |                     |                      |
|-------------|---------------------|----------------------|
| KT_PresetAF | Disp. Setting OSD   | 8x 01 70 02 00 FF    |
|             | Cancel & Exit       | 8x 01 70 02 01 FF    |
|             | Save & Exit         | 8x 01 70 02 02 FF    |
|             | Test PRESET         | 8x 01 70 02 10 FF    |
|             | Set Preset AF Range | 8x 01 70 03 0p 0q FF |

- (1) If you want to output the PRESET POSITION setting screen, send SETTING OSD command.
- (2) To save the current zoom and focus position in the PRESET position, send the SAVE & EXIT command. To end without saving, send CANCEL&EXIT command.
- (3) To save the current zoom and focus position to PRESET position without outputting PRESET POSITION menu, send SAVE & EXIT command.

## Automatic Exposure Mode

- Full Auto mode  
Iris, Gain, Shutter speed can be set automatically.
- Shutter Priority mode  
Variable shutter speed : 1/1(X32)~1/30000  
Auto Iris & Gain
- Iris Priority mode  
Variable Iris : F1.6 ~ Close, 14steps  
Auto Gain & Shutter
- Manual mode  
Variable Iris/Shutter/Gain
- Bright mode  
Variable Iris & Gain, F1.6~58dB  
Shutter speed is maintained at the speed in FULL AUTO or SHUTTER PRIORITY mode.  
The "BRIGHT" mode can be switched to "Full Auto" or "Shutter priority" mode only.

(NOTE) See "Command Setting Values"

## Exposure Compensation

It is a function which offsets the internal reference brightness level used in the AE mode.

|             |                         |                             |
|-------------|-------------------------|-----------------------------|
| CAM_ExpComp | 8x 01 04 4E 00 00 0p 0q | pq=compensation level<br>FF |
|-------------|-------------------------|-----------------------------|

(NOTE) See "Command Setting Values"

## Wide Dynamic Range (WDR)

Images with WDR are produced by combining long-exposure signals(normal shutter) with the signal of the high-intensity portions obtained a short-exposure (high-speed shutter).

(NOTE1) When CVBS is connected, WDR automatically turns off and Digital WDR operates.

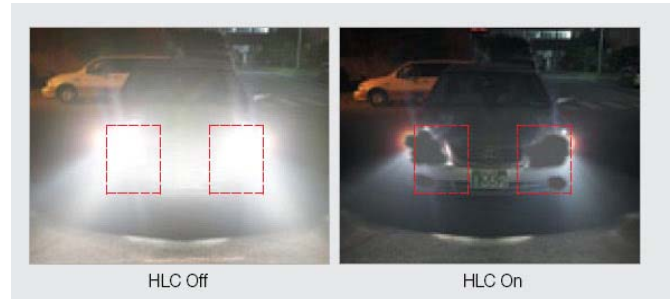


WDR OFF

WDR ON

## High-Light Compensation (HLC)

It's ability to reverse bright points in the picture to black. As an effective approach to recognize vehicle plate number at night, HLC function can detect any spotlight diffused by object-vehicle and compensate it for obtaining clearer image.



## Spot AE

- Available in Full Auto AE mode.
- A particular section of the subject can be designated, and then that portion of the image can be weighted and a value computed so that iris and gain can be optimized to obtain an image.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 6 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

|            |          |                            |                         |
|------------|----------|----------------------------|-------------------------|
| CAM_SpotAE | On       | 8x 01 04 59 02 FF          | Spot AE mode            |
|            | Off      | 8x 01 04 59 03 FF          |                         |
|            | Position | 8x 01 04 29 0p 0q 0r 0s FF | pq:X(0~F),<br>rs:Y(0~F) |

## Noise Reduction

- 3D-NR
- 2D-NR

## Defog

- Sharpens cloudy images such as fog.

## Slow AE Response

The Slow AE Response function allows you to reduce the exposure response speed.

(example) If the headlights of a car are caught by the camera, the camera automatically adjusts the exposure so that it can shoot a high-intensity subject. Since AE responds slowly, it can prevent images from being shot.

|                 |                   |                            |
|-----------------|-------------------|----------------------------|
| CAM_AE_Response | 8x 01 04 5D pp FF | pp: 01 to 30<br>default 01 |
|-----------------|-------------------|----------------------------|

## Digital Image Stabilizer

This function reduces image blurring caused by vibration

- **RANGE** : Set the compensation range. Up to 30% of the input image range is used, and digital zoom is required up to 1.4 times according to the setting.
- **FILTER**: Correction filter for the worst case of the image (built-in Hold filter). If you increase the setting value, the correction becomes less. If you decrease the setting value, the correction becomes better. However, a malfunction may occur in a moving subject or a low-illuminance / no-pattern image.
- **AUTO C** : Auto Centering to distinguish camera shake from PANNING. It compensates for high frequency vibrations such as tremor and allows the screen to move naturally to the camera's PANNING. In the case of **FULL**, the camera always corrects the direction in which the image is positioned at the center of the image. In the case of **HALF**, the center of the correction area is completely corrected (PANNING is ignored) and only the periphery is centered.



(before)



(after)

## Home Position Mode

After power on, you can choose whether to move to the last position before power off or to x1 position.

|                |     |                   |                                         |
|----------------|-----|-------------------|-----------------------------------------|
| KT_HomePowerOn | On  | 8x 01 70 24 02 FF | Moving to x1 position                   |
|                | Off | 8x 01 70 24 03 FF | Move to final position before power off |

## Memory Preset

16 sets of camera shooting conditions can be stored and recalled.

- Zoom Position
- Digital Zoom Mode
- Focus Mode
- AE mode
- Shutter control parameters
- Bright , Iris, Gain
- Exposure Compensation mode
- Exposure Level
- Backlight Compensation mode
- Auto Slow Shutter On/Off
- White Balance mode
- Red/Blue Gain
- Aperture Control
- ICR mode, Defog, WDR mode

|            |        |                      |                      |
|------------|--------|----------------------|----------------------|
| CAM_Memory | Reset  | 8x 01 04 3F 00 0p FF | p:Memory Number(0~F) |
|            | Set    | 8x 01 04 3F 01 0p FF |                      |
|            | Recall | 8x 01 04 3F 02 0p FF |                      |

(See. Custom/Memory Preset Setting Items)

## Custom Preset

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

- The above memory preset contents
- Privacy mask, Motion detect , Title
- Flip, mirror, negative, BW, Gamma, DNR, DIS, AF controls, camera ID, HLC, ETC.

|            |          |                      |                                                    |
|------------|----------|----------------------|----------------------------------------------------|
| CAM_Custom | Reset    | 8x 01 04 3F 00 7F FF | Starts up in this mode when the power is turned on |
|            | Set      | 8x 01 04 3F 01 7F FF |                                                    |
|            | Recall   | 8x 01 04 3F 02 7F FF |                                                    |
|            | Inactive | 8x 01 04 3F 10 7F FF |                                                    |
|            | Active   | 8x 01 04 3F 11 7F FF |                                                    |

(See. Custom/Memory Preset Setting Items)

(NOTE)

You can decide whether to use a custom preset.

When the product is shipped, custom preset is disabled(inactive mode)

To enable the custom preset, the user must send **SET/RECALL** or **ACTIVE** command.

To disable the custom preset, send **INACTIVE** command.

<Custom Preset Mode>

When the power is turned on,

- **Active** : starts up in the custom preset settings

- **Inactive** : starts up in the settings before the power is turned off

(factory shipment default : Inactive mode)

## User Memory Area

You can use up to 16 bytes to store data such as camera number.



## Position Preset

The current zoom / focus position can be stored in the internal memory and moved to that position if necessary. A total of 256 locations can be stored.

|                           |                           |                                           |                                                                                                                |
|---------------------------|---------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| KT_ZoomFocus<br>Preset    | Set                       | 8x 01 70 3F 01 0p<br>0q 0r FF             | pqr : preset Number<br>(0x000~0x0FF)                                                                           |
|                           | Recall                    | 8x 01 70 3F 02 0p<br>0q 0r FF             |                                                                                                                |
|                           | Clear                     | 8x 01 70 3F 03 0p<br>0q 0r FF             |                                                                                                                |
|                           | Clear All Preset          | 8x 01 70 3F 0F 00<br>00 00 FF             |                                                                                                                |
| KT_ZoomFocus<br>PresetInq | 8x 09 703F 0n 0n<br>0n FF | y0 50 0v 0z 0z<br>0z 0z 0f 0f 0f 0f<br>FF | nnn: preset number<br>(0x000~0x0FF)<br>v : 1(saved), 0(empty)<br>zzzz : zoom position<br>ffff : focus position |

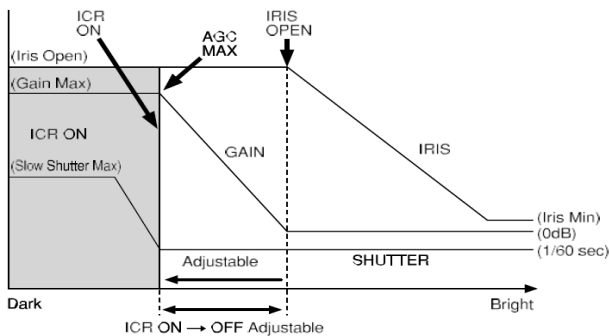
## Day & Night Setting

### • AUTO Mode

If the current illumination is darker than the ICR ON level, the IR cut filter is removed. If it is brighter than the ICR OFF level, the IR cut filter is enabled.

ICR ON level = Day To Night level

ICR OFF level = Night To Day level



### • DAY Mode (=ICR OFF fixed)

It always maintains the DAY (color) state regardless of the current illumination.

### • NIGHT Mode (=ICR ON fixed)

It always maintains the NIGHT (B/W) state regardless of the current illumination.

### • EXT-L/H Mode

DAY / NIGHT is determined according to the external input signal.

In EXT-H mode, when the input signal level is greater than DAY TO NIGHT LEVEL, it switches to NIGHT.

In EXT-L mode, if the input signal level is lower than DAY TO NIGHT LEVEL, it switches to NIGHT.

|                                         |                   |                         |
|-----------------------------------------|-------------------|-------------------------|
| KT_DayNightMod<br>e <sup>(*)</sup>      | Auto              | 8x 01 70 04 00 FF       |
|                                         | Day               | 8x 01 70 04 01 FF       |
|                                         | Night             | 8x 01 70 04 02 FF       |
|                                         | Ext-High          | 8x 01 70 04 03 FF       |
|                                         | Ext-Low           | 8x 01 70 04 04 FF       |
| KT_ExtICRthreshold<br>ld <sup>(*)</sup> | Day->Night(EXT-H) | 8x 01 70 05 10 0p 0q FF |
|                                         | Night->Day(EXT-H) | 8x 01 70 05 11 0p 0q FF |
|                                         | Day->Night(EXT-L) | 8x 01 70 05 20 0p 0q FF |
|                                         | Night->Day(EXT-L) | 8x 01 70 05 21 0p 0q FF |

## Motion Detect Function

Motion Detect functions instructs the camera to detect movement within monitoring area and then send an alarm signal automatically.

### ◇ Frame

You can set up to 4-frames

Each frame can be set up :

Using VISCA : 16 (horizontally)×8 (vertically) blocks

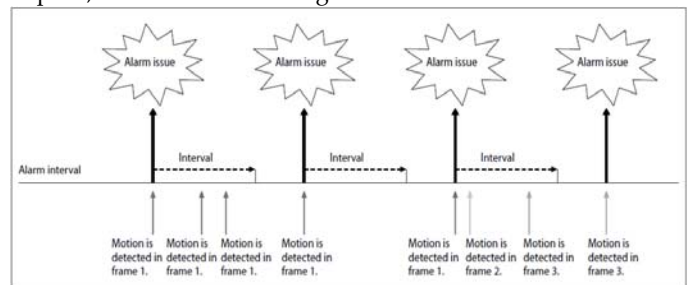
Using MENU : 60 (horizontally)×34 (vertically) blocks

### ◇ Sending Alarms

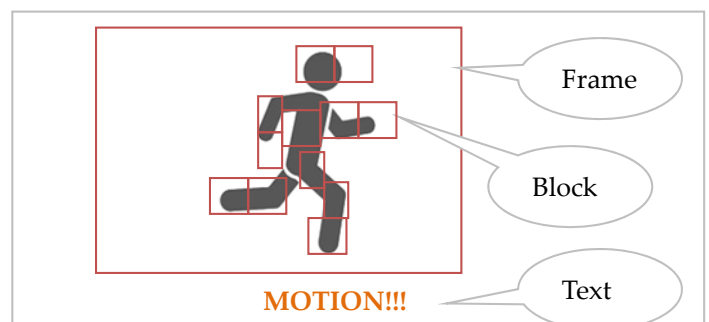
• When motion is detected, the Alarm Replay command is issued via the serial command (VISCA) communication line.

• When multiple motions are detected or motion is detected in another frame within the set interval following the original time the alarm was issued, another alarm command is not issued.

• When motion is detected after the interval time elapsed, the alarm is issued again.



|               |                                     |                                                                                                                                                                                                                                                        |
|---------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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<br>0p 0q 0r 0s FF | m: Display mode (when motion is detected)<br>bit0 : frame display<br>bit1 : block display<br>bit2 : Text display<br>n: Detection Frame Set (0 to F)<br>bit0(frame1)-bit3(frame4)<br>pq: Threshold Level (00 to FF)<br>rs: Interval Time set (00 to FF) |
| Window Set    | 8x 01 04 1D 0m 0p<br>0q rr 0s FF    | m: Select Detection Frame (0, 1, 2, 3)<br>p: Start Horizontal Position (00 to 0F)<br>q: Start Vertical Position (00 to 07)<br>r: Stop Horizontal Position (01 to 10)<br>s: Stop Vertical Position (01 to 08)                                           |
| Alarm (Reply) | y0 07 04 1B 0p FF                   | p: Detection Frame Number                                                                                                                                                                                                                              |



(\*) Blocks are output only within the Frame area.

## Privacy Zone Masking

Privacy Zone masking protects private objects and areas such as house windows, entrances, and exits which are within the camera's range of vision but not subject to surveillance. Privacy zone masking can be masked on the monitor to protect privacy.

- Mask can be set on up to 16 places according to Pan/Tilt positions.
- Interlocking control with zooming.
- Interlocking control with Pan/Tilt.
- Non-interlocking control with Pan/Tilt.

| Command Set     | Command           | Command                                               | Comments                                                                                                                                                                                         |
|-----------------|-------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_PrivacyZone | SetMask           | 8x 01 04 76 mm nn<br>0r 0r 0s 0s FF                   | Setting Mask(Size)<br>See "mm: Mask setting list", "nn: Setting",<br>and "rr: w, ss: h" in "Parameters"                                                                                          |
|                 | Display           | 8x 01 04 77 pp pp pp pp<br>FF                         | Setting Mask Display On/Off<br>See "pp pp pp pp: Mask bit" in "Parameters".<br>pp pp pp pp: Mask setting (0: OFF, 1: ON)                                                                         |
|                 | SetMaskColor      | 8x 01 04 78 pp pp pp pp<br>qq rr FF                   | Setting Color of Mask<br>See "pp pp pp pp: Mask bit" and "qq, rr: Color<br>code" in "Parameters".<br>qq: Color setting when setting the Mask bit<br>to 0 rr: Color setting when setting the Mask |
|                 | SetPanTiltAngle   | 8x 01 04 79 0p 0p 0p<br>0q 0q 0q FF                   | Setting Pan/Tilt Angle<br>See "Setting pan/tilt angle" in "Parameters".<br>ppp: Pan angle, qq: Tilt angle                                                                                        |
|                 | SetPTZMask        | 8x 01 04 7B mm<br>0p 0p 0p 0q 0q 0q 0r 0r<br>0r 0r FF | Setting the direct position of PTZ<br>See "mm: Mask setting list" and "Setting<br>pan/tilt angle" in "Parameters".<br>ppp: Pan, qq: Tilt, rrr: Zoom                                              |
|                 | Non_InterlockMask | 8x 01 04 6F mm<br>0p 0p 0q 0q 0r 0r 0s 0s FF          | Setting non-interlocking the mask to<br>pan/tilt See "mm: Mask setting list"<br>and "pp:x,qq:y, rr:w, ss:                                                                                        |

| Inquiry Command       | Command Packet    | Inquiry Packet                            | Comments                                                                                                                                                                                               |
|-----------------------|-------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAM_PrivacyDisplayInq | 8x 09 04 77 FF    | y0 50 pp pp pp pp FF                      | Inquiry about the status of Setting Mask Display<br>On/ Off<br>See "pp pp pp pp: Mask bit" in "Parameters".<br>1:On, 0:Off                                                                             |
| CAM_PrivacyPanTiltInq | 8x 09 04 79 FF    | y0 50 0p 0p 0p 0q 0q<br>0q FF             | Inquiry about the pan/tilt position currently set<br>See "Setting pan/tilt angle" in "Parameters".<br>ppp: Pan, qq: Tilt                                                                               |
| CAM_PrivacyPTZInq     | 8x 09 04 7B mm FF | y0 50 0p 0p 0p 0q 0q<br>0q 0r 0r 0r 0r FF | Inquiry about pan/tilt/zoom position at the mm<br>Mask setting<br>See "mm: Mask setting list" and "Setting<br>pan/tilt angle" in "Parameters".<br>ppp: Pan position,<br>qq: Tilt Position<br>rrr: Zoom |
| CAM_PrivacyMonitorInq | 8x 09 04 6F FF    | y0 50 pp pp pp pp FF                      | Inquiry about the mask currently displayed<br>See "pp pp pp pp: Mask bit" in "Parameters".                                                                                                             |

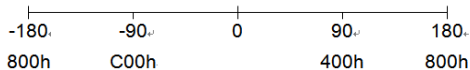
- Mask Number : A=0x00, B=0x01,...W=0x16, X=0x17 (total 24 masks)
- Mask Bit & Mask List(mm)

|          | pp pp pp pp (mask bit) or mm(Mask list) |   |   |   |   |   |   |   |    |   |   |   |    |    |    |    |    |   |    |    |    |    |    |    |
|----------|-----------------------------------------|---|---|---|---|---|---|---|----|---|---|---|----|----|----|----|----|---|----|----|----|----|----|----|
| byte     | 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  |
| Mask     | -                                       | - | - | - | - | - | - | - | -  | - | - | - | P  | O  | N  | M  | -  | - | L  | K  | J  | I  | H  | G  |
| List(mm) |                                         |   |   |   |   |   |   |   |    |   |   |   | 0F | 0E | 0D | 0C |    |   | 0B | 0A | 09 | 08 | 07 | 06 |

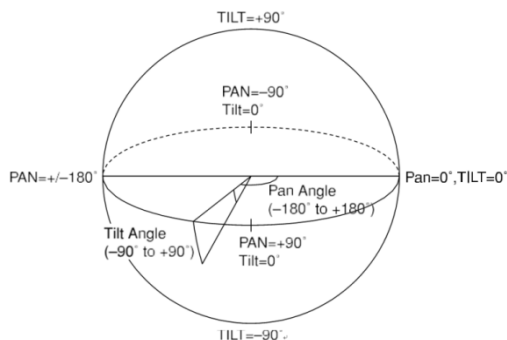
The priority order of the mask display is in the sequence from A (highest) to P (lowest).

## ● Pan/Tilt Angle

Angle/Parameter of Angle (ppp, qqg)



Set the angle resolution to 360 (degree)/4096 (1000h).

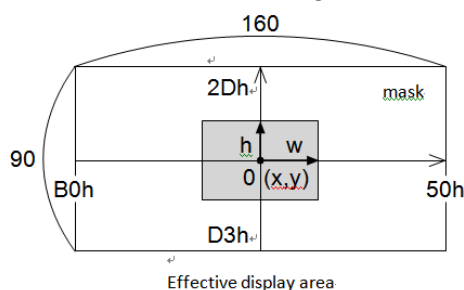


- ✓ You can use the tilt angle at which you can set the mask between -90 to +90 degrees. But the recommended tilt angle is between -70 to +70 degrees.
- ✓ It is recommended that you set the size to at least twice the size of the object (height and width).

## ● Mask Color (qq, rr)

| Mask (Color) | Normal | Translucence |
|--------------|--------|--------------|
| Black        | 00h    | 10h          |
| Gray1        | 01h    | 11h          |
| Gray2        | 02h    | 12h          |
| Gray3        | 03h    | 13h          |
| Gray4        | 04h    | 14h          |
| Gray5        | 05h    | 15h          |
| Gray6        | 06h    | 16h          |
| White        | 07h    | 17h          |
| Red          | 08h    | 18h          |
| Green        | 09h    | 19h          |
| Blue         | 0Ah    | 1Ah          |
| Cyan         | 0Bh    | 1Bh          |
| Yellow       | 0Ch    | 1Ch          |
| Magenta      | 0Dh    | 1Dh          |

## ● Mask Size : Width/Height



## Title / Function Display

The user can output desired characters on the screen and can also choose the output font size.

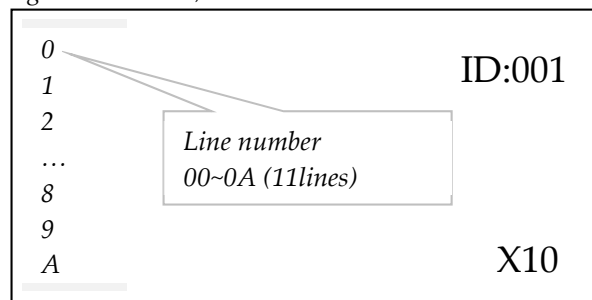
See. "CAM\_Title", "CAM\_MultiLineTitle", "CAM\_EvenLineTitle"

### ● Select Font Size

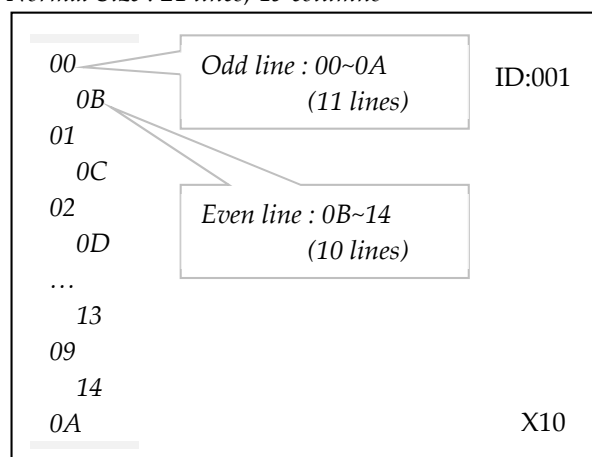
|             |        |                   |
|-------------|--------|-------------------|
| KT_FontSize | Normal | 8x 01 70 15 30 FF |
|             | Big    | 8x 01 70 15 31 FF |

(\*)Font size default varies by model

Big Size : 11 lines, 40columns



Normal Size : 21 lines, 49 columns



### ● Function OSD display

The current setting status of the camera is displayed on the screen.

|             |     |                   |
|-------------|-----|-------------------|
| CAM_Display | On  | 8x 01 04 15 02 FF |
|             | Off | 8x 01 04 15 03 FF |

(example)

|           |      |         |
|-----------|------|---------|
| 1080p/30  | FLIP | CAPTURE |
| ZOOM 3A30 |      | WDR     |
| DZOOM E8  |      | ICR     |
| F1.6      | 28dB |         |
| MF FAR    |      |         |
| 1/1000    |      |         |

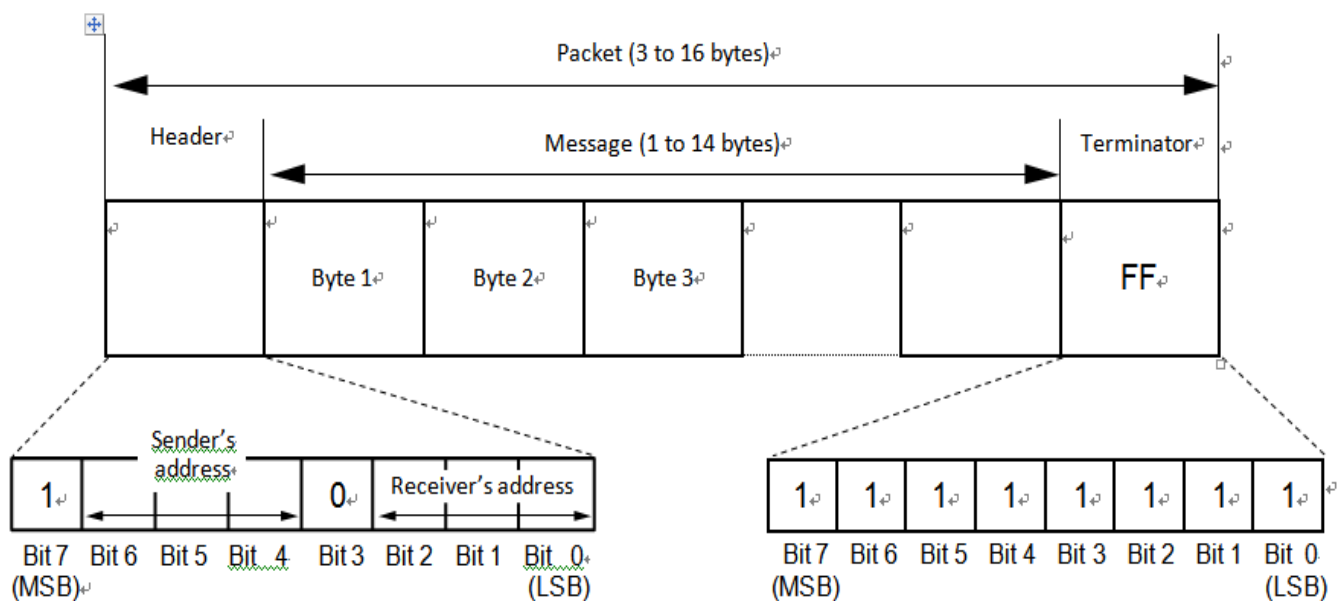
# COMMAND LIST

## Overview of RS232 Communication

- Communication speed :  
2400/4800/9600/19200/38400/57600/115200bps
- Data bits : 8
- Start bit : 1
- Stop bit : 1
- Non parity
- Flow control using XON/XOFF and RTS/CTS, etc., is not supported

## Command & Inquiry

- **Command**  
Sends operational commands to the camera
  - **Inquiry**  
Used for inquiring about the current state of the camera
- |         | Command Packet  | Note                                                                  |
|---------|-----------------|-----------------------------------------------------------------------|
| Inquiry | 8X QQ RR ... FF | QQ <sub>1</sub> = Command/Inquiry,<br>RR <sub>2</sub> = category code |
- 1) QQ = 01 (Command), 09 (Inquiry)
  - 2) RR = 00 (Interface), 04 (camera 1),  
06 (Pan/Tilter), 07 (camera 2)
  - X = 1 to 7 : camera address



Header : Usually it uses 0x81

## Inquiries

### ● ACK message

Returned by the camera when it receives a command.  
No ACK message is returned for inquiries.

### ● Completion message

Returned by the camera when execution of commands or inquiries is completed. In the case of inquiry commands, it will contain reply data for the inquiry after the 3rd byte of the packet. If the ACK message is omitted, the socket number will contain 0.

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

X = 9 to F: camera address + 8

### ● Error message

| Error Packet | Description                      |
|--------------|----------------------------------|
| X0 6Y 01 FF  | Message length error (>14 bytes) |
| X0 6Y 02 FF  | Syntax Error                     |
| X0 6Y 03 FF  | Command Buffer Full              |
| X0 6Y 04 FF  | Command cancelled                |
| X0 6Y 05 FF  | No socket                        |
| X0 6Y 41 FF  | Command not executable           |

X = 9 to F: camera address + 8, Y = socket number

### ● Cam\_VersionInq

Returns information on the VISCA interface.

| Inquiry        | Packet         | Reply                         | Description                                                                           |
|----------------|----------------|-------------------------------|---------------------------------------------------------------------------------------|
| Cam_VersionInq | 8X 09 00 02 FF | Y0 50 GG GG HH HH JJ JJ KK FF | GGGG=Vender ID<br>HHHH=Model ID<br>JJJJ = ROM version<br>KK=Maximum<br>socket # (=02) |

X = 1 to 7 : camera address (For inquiry packet)

X = 9 to F : camera address +8 (For reply packet)

GGGG = 0x0078 (vendor=KTNC)

HHHH : Model Code

HZ7833M-LT : 0467

HZ7833M-LA : 0467

JJJJ : ex) 0123 = Ver1.2.3

### ● Network change

Camera automatically transmits when power is turned on.

#### Packet

Network change X0 38 FF (X=9)

## Command / ACK Example

| Command              | Command Message                | Reply Message                                                | Comments                                                                                       |
|----------------------|--------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| General Command      | 81 01 04 38 02 FF<br>(Example) | 90 41 FF (ACK)+90 51 FF<br>(Completion)<br>90 42 FF 90 52 FF | Returns ACK when a command has been accepted, and Completion when a command has been executed. |
|                      | 81 01 04 38 FF<br>(Example)    | 90 60 02 FF (Syntax Error)                                   | Accepted a command which is not supported or a command lacking parameters.                     |
|                      | 81 01 04 08 02 FF<br>(Example) | 90 61 41 FF<br>(Command Not Executable)<br>90 62 41 FF       | Could not execute the command in the current mode.                                             |
| Inquiry Command      | 81 09 04 38 FF<br>(Example)    | 90 50 02 FF (Completion)                                     | ACK is not returned for the inquiry command.                                                   |
|                      | 81 09 05 38 FF<br>(Example)    | 90 60 02 FF (Syntax Error)                                   | Accepted an incompatible command.                                                              |
| Address Set          | 88 30 01 FF                    | 88 30 02 FF                                                  | Returned the device address to +1.                                                             |
| IF_Clear (Broadcast) | 88 01 00 01 FF                 | 88 01 00 01 FF                                               | Returned the same command.                                                                     |
| IF_Clear (For x)     | 8x 01 00 01 FF                 | z0 50 FF (Completion)                                        | ACK is not returned for this command.                                                          |

## CAMERA COMMAND LIST

| Command Set      | Command              | Command Packet                         | Comments                                                          |
|------------------|----------------------|----------------------------------------|-------------------------------------------------------------------|
| AddressSet       | Broadcast            | 88 30 01 FF                            | Address setting                                                   |
| IF_Clear         | Broadcast            | 88 01 00 01 FF                         | I/F Clesr                                                         |
| CommandCancel    | –                    | 8x 2p FF                               | p: Socket No. (=1 or 2)                                           |
| CAM_Power        | On                   | 8x 01 04 00 02 FF                      | Power ON/OFF                                                      |
|                  | Off (Standby)        | 8x 01 04 00 03 FF                      |                                                                   |
| CAM_Zoom         | Stop                 | 8x 01 04 07 00 FF                      |                                                                   |
|                  | Tele (Standard)      | 8x 01 04 07 02 FF                      |                                                                   |
|                  | Wide (Standard)      | 8x 01 04 07 03 FF                      |                                                                   |
|                  | Tele (Variable)      | 8x 01 04 07 2p FF                      | p=0 (Low) to 7 (High)                                             |
|                  | Wide (Variable)      | 8x 01 04 07 3p FF                      |                                                                   |
|                  | Direct               | 8x 01 04 47 0p 0q 0r 0s FF             | pqrs: Zoom Position                                               |
|                  | Direct Zoom/Focus    | 8x 01 04 47 0z 0z 0z 0z 0f 0f 0f 0f FF | zzzz : zoom position<br>ffff : focus position                     |
| 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 Separate                                     |
|                  | Stop                 | 8x 01 04 06 00 FF                      |                                                                   |
|                  | Tele (Variable)      | 8x 01 04 06 2p FF                      | p=0 (Low) to 7 (High)                                             |
|                  | Wide (Variable)      | 8x 01 04 06 3p FF                      | * Enabled during Separate Mode                                    |
|                  | x1/Max               | 8x 01 04 06 10 FF                      | x1/MAX Magnification Switchover<br>* Enabled during Separate Mode |
|                  | Direct               | 8x 01 04 46 00 00 0p 0q FF             | pq: D-Zoom Position<br>* Enabled during 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 (Low) to 7 (High)                                             |
|                  | 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                                   |
| AF Sensitivity   | Normal               | 8x 01 04 58 02 FF                      | AF Sensitivity High/Low                                           |
|                  | Low                  | 8x 01 04 58 03 FF                      |                                                                   |
| CAM_AFMMode      | Normal AF            | 8x 01 04 57 00 FF                      | AF Movement Mode                                                  |
|                  | Interval AF          | 8x 01 04 57 01 FF                      |                                                                   |
|                  | Zoom Trigger AF      | 8x 01 04 57 02 FF                      |                                                                   |
|                  | PRESET               | 8x 01 04 57 03 FF                      |                                                                   |
|                  | Active/Interval Time | 8x 01 04 27 0p 0q 0r 0s FF             | pq: Movement Time, rs: Interval                                   |
| CAM_IRCorrection | Standard             | 8x 01 04 11 00 FF                      | FOCUS IR compensation data switching                              |
|                  | IR Light             | 8x 01 04 11 01 FF                      |                                                                   |
| CAM_ZoomFocus    | Direct               | 8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF | pqrs: Zoom Position<br>tuvw: Focus Position                       |
| CAM_Initialize   | Lens                 | 8x 01 04 19 01 FF                      | Lens Initialization Start                                         |
|                  | Camera               | 8x 01 04 19 03 FF                      | Camera reset                                                      |
| CAM_WB           | Auto                 | 8x 01 04 35 00 FF                      | Normal Auto                                                       |
|                  | Indoor               | 8x 01 04 35 01 FF                      | Indoor mode                                                       |
|                  | Outdoor              | 8x 01 04 35 02 FF                      | Outdoor mode                                                      |
|                  | One Push WB          | 8x 01 04 35 03 FF                      | One Push WB mode                                                  |
|                  | ATW                  | 8x 01 04 35 04 FF                      | Auto Tracing White Balance                                        |
|                  | Manual               | 8x 01 04 35 05 FF                      | Manual Control mode                                               |
|                  | One Push Trigger     | 8x 01 04 10 05 FF                      | One Push WB Trigger                                               |
| CAM_RGain        | Reset                | 8x 01 04 03 00 FF                      | Manual Control of R Gain                                          |

|                                   |                  |                                           |                                                                       |
|-----------------------------------|------------------|-------------------------------------------|-----------------------------------------------------------------------|
|                                   | Up               | 8x 01 04 03 02 FF                         |                                                                       |
|                                   | Down             | 8x 01 04 03 03 FF                         |                                                                       |
|                                   | Direct           | 8x 01 04 43 00 00 0p 0q FF                |                                                                       |
| CAM_BGain                         | Reset            | 8x 01 04 04 00 FF                         | pq: R Gain, 0x00~0xff                                                 |
|                                   | Up               | 8x 01 04 04 02 FF                         | Manual Control of B Gain                                              |
|                                   | Down             | 8x 01 04 04 03 FF                         |                                                                       |
|                                   | Direct           | 8x 01 04 44 00 00 0p 0q FF                |                                                                       |
|                                   |                  |                                           | pq: B Gain, 0x00~0xff                                                 |
| CAM_AE                            | Full Auto        | 8x 01 04 39 00 FF                         | Automatic Exposure mode                                               |
|                                   | Manual           | 8x 01 04 39 03 FF                         | Manual Control mode                                                   |
|                                   | Shutter Priority | 8x 01 04 39 0A FF                         | Shutter Priority Automatic Exposure mode                              |
|                                   | Iris Priority    | 8x 01 04 39 0B FF                         | Iris Priority Automatic Exposure mode                                 |
|                                   | Bright           | 8x 01 04 39 0D FF                         | Bright Mode (Manual control)                                          |
| CAM_SlowShutter                   | Auto             | 8x 01 04 5A 02 FF                         | Auto Slow Shutter ON/OFF                                              |
|                                   | Manual           | 8x 01 04 5A 03 FF                         |                                                                       |
| 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, 0x00~0x1E, See GAIN POS.                           |
|                                   | Gain Limit       | 8x 01 04 2C pp FF                         | pp: Gain Position, 0x00~0x1E, See GAIN LIMIT                          |
| 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, 0x00~0x0E                                       |
| CAM_BackLight                     | On               | 8x 01 04 33 02 FF                         | Back Light Compensation ON/OFF                                        |
|                                   | Off              | 8x 01 04 33 03 FF                         |                                                                       |
| CAM_AE_Response                   | Direct           | 8x 01 04 5D pp FF                         | pp: Automatic Exposure Response Setting (01 to 30), default value: 01 |
| CAM_WD                            | On               | 8x 01 04 3D 02 FF                         | Wide-D ON/OFF                                                         |
|                                   | Off              | 8x 01 04 3D 03 FF                         |                                                                       |
|                                   | Set Parameter    | 8x 01 04 2D 00 00 00<br>0s 00 00 00 00 FF | s: Blown-out highlight correction level (0:low, 1:middle, 2:high)     |
| CAM_Aperture<br>(sharpness level) | Reset            | 8x 01 04 02 00 FF                         | Aperture Control<br>(sharpness)                                       |
|                                   | 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 (0x00~0x0F)                                         |
| CAM_HR                            | On               | 8x 01 04 52 02 FF                         | High-Resolution Mode ON/OFF                                           |
|                                   | Off              | 8x 01 04 52 03 FF                         |                                                                       |
| CAM_NR                            | —                | 8x 01 04 53 0p FF                         | p: NR Setting (0: OFF, level 1 to 5)                                  |
| CAM_Gamma                         | —                | 8x 01 04 5B 0p FF                         | p: Gamma setting (0: Standard, 1 to 6)<br>See. GAMMA POSITION         |
| CAM_HighSensitivity               | On               | 8x 01 04 5E 02 FF                         | High Sensitivity mode ON/OFF                                          |
|                                   | Off              | 8x 01 04 5E 03 FF                         |                                                                       |
| CAM_LR_Reverse                    | On               | 8x 01 04 61 02 FF                         | Mirror Image ON/OFF                                                   |
|                                   | Off              | 8x 01 04 61 03 FF                         |                                                                       |
| CAM_Freeze                        | On               | 8x 01 04 62 02 FF                         | Still Image ON/OFF                                                    |
|                                   | Off              | 8x 01 04 62 03 FF                         |                                                                       |
| CAM_PictureEffect                 | Off              | 8x 01 04 63 00 FF                         | Picture Effect Setting<br>(*) do not support neg.art                  |
|                                   | Neg.Art          | 8x 01 04 63 02 FF                         |                                                                       |
|                                   | B&W              | 8x 01 04 63 04 FF                         |                                                                       |
| CAM_PictureFlip                   | On               | 8x 01 04 66 02 FF                         | Picture flip ON/OFF                                                   |
|                                   | Off              | 8x 01 04 66 03 FF                         |                                                                       |
| CAM_ICR                           | On               | 8x 01 04 01 02 FF                         | Infrared Mode ON(night)/OFF(day)                                      |

|                                                                                                                                                                   |             |                                                                                                                      |                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                   | Off         | 8x 01 04 01 03 FF                                                                                                    |                                                                                                        |
| CAM_AutoICR                                                                                                                                                       | On          | 8x 01 04 51 02 FF                                                                                                    | Auto dark-field mode On/Off                                                                            |
|                                                                                                                                                                   | Off         | 8x 01 04 51 03 FF                                                                                                    |                                                                                                        |
|                                                                                                                                                                   | Threshold   | 8x 01 04 21 00 00 0p 0q FF                                                                                           | pq: ICR ON → OFF Threshold Level (Night->Day)                                                          |
|                                                                                                                                                                   | Threshold   | 8x 01 04 41 00 00 0p 0q FF                                                                                           | pq: ICR OFF → ON Threshold Level (Day->Night)                                                          |
| CAM_AutoICRAAlarmReply                                                                                                                                            | On          | 8x 01 04 31 02 FF                                                                                                    | Auto ICR switching Alarm ON/OFF                                                                        |
|                                                                                                                                                                   | Off         | 8x 01 04 31 03 FF                                                                                                    |                                                                                                        |
|                                                                                                                                                                   | (Reply)     | y0 07 04 31 02 FF                                                                                                    | ICR OFF → ON (Night->Day)                                                                              |
|                                                                                                                                                                   |             | y0 07 04 31 03 FF                                                                                                    | ICR ON → OFF (Day->Night)                                                                              |
| CAM_MemSave                                                                                                                                                       | Write       | 8x 01 04 23 0X 0p 0p 0q 0q FF                                                                                        | X: 00 to 07 (Address), total 16 byte<br>ppqq: 0x0000 to 0xFFFF (Data)                                  |
| CAM_Display                                                                                                                                                       | On          | 8x 01 04 15 02 FF<br>(8x 01 06 06 02 FF)                                                                             | Display ON/OFF (function OSD display)                                                                  |
|                                                                                                                                                                   | Off         | 8x 01 04 15 03 FF<br>(8x 01 06 06 03 FF)                                                                             | Function OSD :<br>- Display item : Zoom Ratio, Camera ID<br>Framerate, AE mode, WB mode, Exposure Data |
|                                                                                                                                                                   | On/Off      | 8x 01 04 15 10 FF<br>(8x 01 06 06 10 FF)                                                                             |                                                                                                        |
| CAM_Title                                                                                                                                                         | Title Set1  | 8x 01 04 73 00 mm nn pp qq 00<br>00 00 00 00 00 FF                                                                   | mm : V-position(0x00~0x14) , nn:H-position (00~28)<br>pp:color, qq:blink                               |
| Total 21 lines                                                                                                                                                    | Title Set2  | 8x 01 04 73 01 mm nn pp qq rr<br>ss tt uu vv ww FF                                                                   | mm~ww : setting of display characters<br>(1st to 10st)                                                 |
| See. "Title/Function display"                                                                                                                                     | Title Set3  | 8x 01 04 73 02 mm nn pp qq rr<br>ss tt uu vv ww FF                                                                   | mm~ww : setting of display characters<br>(11st to 20st)                                                |
|                                                                                                                                                                   | Title Set4  | 8x 01 04 73 07<br>01 02 03 04 05 06 07 08 09 10 11<br>12 13 14 15 16 17 18 19 20 21 22<br>23 24 25 26 27 28 29 30 FF | mm~ww : setting of display characters<br>(1st to 30st)                                                 |
|                                                                                                                                                                   | Title Clear | 8x 01 04 74 00 FF                                                                                                    | Title Setting Clear (clear all lines)                                                                  |
|                                                                                                                                                                   | On          | 8x 01 04 74 02 FF                                                                                                    | Title Display On (display all lines)                                                                   |
|                                                                                                                                                                   | Off         | 8x 01 04 74 03 FF                                                                                                    | Title Display Off (display off all lines)                                                              |
|                                                                                                                                                                   |             |                                                                                                                      |                                                                                                        |
| CAM_MultiLineTitle                                                                                                                                                | Title Set1  | 8x 01 04 73 1L 00 nn pp qq 00<br>00 00 00 00 00 FF                                                                   | L: Line Number (0x0~0xA)<br>nn: H-position → nn : 00~0x28<br>pp: Color, qq: Blink                      |
| See. "Title/Function display"<br><br>(Big Font or<br>Normal Font Odd Line )<br><br>L =<br>0x0 = Line 00<br>0x1 = Line 01<br>...<br>0x9 = Line 09<br>0xA = Line 0A | Title Set2  | 8x 01 04 73 2L mm nn pp qq rr<br>ss tt uu vv ww FF                                                                   | L: Line Number (0x0~0xA)<br>mnpqrstuvw: Setting of characters (1 to 10)                                |
|                                                                                                                                                                   | Title Set3  | 8x 01 04 73 3L mm nn pp qq rr<br>ss tt uu vv ww FF                                                                   | L: Line Number (0x0~0xA)<br>mnpqrstuvw: Setting of characters (11 to 20)                               |
|                                                                                                                                                                   | Title Set4  | 8x 01 04 73 7L 01 02 03 04 05 06<br>07 08 09 10 11 12 13 14 15 16 17<br>18 19 20 21 22 23 24 25 26 27 28<br>29 30 FF | L: Line Number (0x0~0xA)<br>01~30 : Setting of characters (1 to 30)                                    |
|                                                                                                                                                                   | Title Clear | 8x 01 04 74 1p FF                                                                                                    | Title Clear, Display On/Off<br>p:0x0~0xA, F= all lines (line 00~0A)                                    |
|                                                                                                                                                                   | On          | 8x 01 04 74 2p FF                                                                                                    |                                                                                                        |
|                                                                                                                                                                   | Off         | 8x 01 04 74 3p FF                                                                                                    |                                                                                                        |
|                                                                                                                                                                   |             |                                                                                                                      |                                                                                                        |
| CAM_EvenLineTitle                                                                                                                                                 | Title Set1A | 8x 01 04 73 4L 00 nn pp qq 00<br>00 00 00 00 00 FF                                                                   | L: Line Number (0x0~0x9)<br>nn: H-position → nn : 00~0x28<br>pp: Color, qq: Blink                      |
| See. "Title/Function display"<br><br>(Normal Font Even Line)<br><br>L =<br>0x0 = Line 0B<br>0x1 = Line 0C<br>...<br>0x8 = Line 13<br>0x9 = Line 14                | Title Set2A | 8x 01 04 73 5L mm nn pp qq rr<br>ss tt uu vv ww FF                                                                   | L: Line Number (0x0~0x9)<br>mnpqrstuvw: Setting of characters (1 to 10)                                |
|                                                                                                                                                                   | Title Set3A | 8x 01 04 73 6L mm nn pp qq rr<br>ss tt uu vv ww FF                                                                   | L: Line Number (0x0~0x9)<br>mnpqrstuvw: Setting of characters (11 to 20)                               |
|                                                                                                                                                                   | Title Set4A | 8x 01 04 73 8L 01 02 03 04 05 06<br>07 08 09 10 11 12 13 14 15 16 17<br>18 19 20 21 22 23 24 25 26 27 28<br>29 30 FF | L: Line Number (0x0~0x9)<br>01~30 : Setting of characters (1 to 30)                                    |
|                                                                                                                                                                   | Title Clear | 8x 01 04 74 4p FF                                                                                                    | Title Clear, Display On/Off<br>p:0x0~0x9, F= all lines (line 0B ~ 14)                                  |
|                                                                                                                                                                   | On          | 8x 01 04 74 5p FF                                                                                                    |                                                                                                        |
|                                                                                                                                                                   | Off         | 8x 01 04 74 6p FF                                                                                                    |                                                                                                        |
|                                                                                                                                                                   |             |                                                                                                                      |                                                                                                        |
| CAM_Mute                                                                                                                                                          | On          | 8x 01 04 75 02 FF                                                                                                    | Muting ON/OFF                                                                                          |
|                                                                                                                                                                   | Off         | 8x 01 04 75 03 FF                                                                                                    |                                                                                                        |
|                                                                                                                                                                   | On/Off      | 8x 01 04 75 10 FF                                                                                                    |                                                                                                        |
| CAM_PrivacyZone                                                                                                                                                   | SetMask     | 8x 01 04 76<br>mm nn 0r 0r<br>0s 0s FF                                                                               | mm: Mask Settings<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                                                                                    |



|                                      |                   |                                                       |                                                                                                                                                                                                                                                        |
|--------------------------------------|-------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |                   |                                                       | pp pp pp pp: Mask Settings (0: OFF, 1: ON)                                                                                                                                                                                                             |
|                                      | SetMaskColor      | 8x 01 04 78 pp<br>pp pp pp qq rr<br>FF                | pp pp pp pp: Mask Color Settings<br>qq: Color Setting when 0 is<br>selected rr: Color Setting when 1 is<br>selected                                                                                                                                    |
|                                      | SetPanTiltAngle   | 8x 01 04 79 0p 0p 0p<br>0q 0q 0q FF                   | Pan/Tilt Angle Settings<br>ppp: Pan<br>qqq: Tilt                                                                                                                                                                                                       |
|                                      | SetPTZMask        | 8x 01 04 7B mm 0p<br>0p 0p 0q 0q 0q 0r<br>0r 0r 0r FF | Pan/Tilt/Zoom Settings for Mask<br>ppp: Pan, qqq: Tilt, rrrr: Zoom                                                                                                                                                                                     |
|                                      | Non_InterlockMask | 8x 01 04 6F mm<br>0p 0p 0q 0q 0r 0r 0s 0s FF          | mm: Non_Interlock Mask<br>Settings pp: X, q: Y, rr: W, ss: H                                                                                                                                                                                           |
| CAM_IDWrite                          | —                 | 8x 01 04 22 0p 0q 0r 0s FF                            | pqrs: Camera ID (=0000 to FFFF)                                                                                                                                                                                                                        |
| 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<br>FF                   | m: Display mode (when motion is detected)<br>bit0 : frame display<br>bit1 : block display<br>bit2 : Text display<br>n: Detection Frame Set (0 to F)<br>bit0(frame1)~bit3(frame4)<br>pq: Threshold Level (00 to FF)<br>rs: Interval Time set (00 to FF) |
|                                      | Window Set        | 8x 01 04 1D 0m 0p 0q rr 0s FF                         | m: Select Detection Frame (0, 1, 2, 3)<br>p: Start Horizontal Position (00 to 0F)<br>q: Start Vertical Position (00 to 07)<br>r: Stop Horizontal Position (01 to 10)<br>s: Stop Vertical Position (01 to 08)                                           |
|                                      | Alarm (Reply)     | y0 07 04 1B 0p FF                                     | p: Detection Frame Number                                                                                                                                                                                                                              |
| CAM_Continuous<br>ZoomPosReply       | On                | 8x 01 04 69 02 FF                                     | ZoomPosition data Continuous Output On/Off                                                                                                                                                                                                             |
|                                      | Off               | 8x 01 04 69 03 FF                                     |                                                                                                                                                                                                                                                        |
|                                      | (Reply)           | y0 07 04 69 0p 0p 0q 0q 0q 0q<br>FF                   | pp: D-Zoom Position<br>* 00: When Zoom Mode is Combine<br>qqqq: Zoom Position                                                                                                                                                                          |
| CAM_ZoomPos<br>ReplyIntervalTimeSet  | —                 | 8x 01 04 6A 00 00 0p 0p FF                            | pp: Zoom Position continuous output Interval Time<br>[Vertical timing]                                                                                                                                                                                 |
| CAM_Continuous<br>FocusPosReply      | On                | 8x 01 04 16 02 FF                                     | Focus Position data Continuous Output On/Off                                                                                                                                                                                                           |
|                                      | Off               | 8x 01 04 16 03 FF                                     |                                                                                                                                                                                                                                                        |
|                                      | (Reply)           | y0 07 04 16 00 00 0p 0p 0p 0p<br>FF                   | pppp: Focus Position                                                                                                                                                                                                                                   |
| CAM_FocusPos<br>ReplyIntervalTimeSet | —                 | 8x 01 04 1A 00 00 0p 0p FF                            | pp: Focus Position continuous output Interval Time<br>[Vertical timing]                                                                                                                                                                                |
| CAM_ExtAutoICR_thresh<br>old         | ICR ON -> OFF     | 8x 01 04 1F 21 00 00 0p 0q FF                         | pq : ICR ON -> OFF threshold when Auto ICR is on<br>pq = 00h ~ 1Bh (Night → Day threshold)                                                                                                                                                             |
|                                      | ICR OFF -> ON     | 8x 01 04 1F 21 01 00 0p 0q FF                         | pq : ICR OFF -> ON threshold when Auto ICR is on<br>pq = 01h ~ 1Ch (Day→Night threshold)                                                                                                                                                               |
| CAM_RegisterValue                    | —                 | 8x 01 04 24 mm 0p 0p FF                               | mm: Register No. (=00-7F)<br>pp: Register Value (=00-7F)<br><i>See the "Register setting"</i>                                                                                                                                                          |
| CAM_ColorGain                        | Direct            | 8x 01 04 49 00 00 00 0p FF                            | p: Color Gain setting 0h (60%) to Eh (200%)                                                                                                                                                                                                            |
| CAM_ColorHue                         | Direct            | 8x 01 04 4F 00 00 00 0p FF                            | p: Color Hue setting 0h (– 14 dgrees) to Eh (+14 degrees)                                                                                                                                                                                              |
| CAM_Stablizer                        | On                | 8x 01 04 34 02 FF                                     | Digital Image Stabilizer                                                                                                                                                                                                                               |
|                                      | Off               | 8x 01 04 34 03 FF                                     |                                                                                                                                                                                                                                                        |
| CAM_Defog                            | On                | 8x 01 04 37 02 0p FF                                  | Defog On/Off<br>p: defog level(1:low,2:middle,3:high)                                                                                                                                                                                                  |
|                                      | Off               | 8x 01 04 37 03 00 FF                                  |                                                                                                                                                                                                                                                        |
| CAM_HLC                              | Parameter Set     | 8x 01 04 14 0p 0q FF                                  | p:HLC Level (0:Off, 1:On)<br>q:HLC mask level(0:Off, 1(low)~F(high)                                                                                                                                                                                    |
| CAM_SpotAE                           | On                | 8x 01 04 59 02 FF                                     | Spot AE mode                                                                                                                                                                                                                                           |
|                                      | Off               | 8x 01 04 59 03 FF                                     |                                                                                                                                                                                                                                                        |
|                                      | Position          | 8x 01 04 29 0p 0q 0r 0s FF                            | pq:X(0~F), rs:Y(0~F)                                                                                                                                                                                                                                   |
| CAM_Memory                           | Reset             | 8x 01 04 3F 00 0p FF                                  | p:Memory Number(0~F)<br>(See. Custom/Memory Preset Setting Items)                                                                                                                                                                                      |
|                                      | 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 up in this mode when the power is turned on                                                                                                                                                                                                     |

|  |          |                      |                                                                                                                                                                                                                                  |
|--|----------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Set      | 8x 01 04 3F 01 7F FF | (*)The SET command must be sent one time to activate the custom preset.<br>(*) Inactive : When the power is turned on, it starts up in the settings before the power is turned off.<br>(See. Custom/Memory Preset Setting Items) |
|  | Recall   | 8x 01 04 3F 02 7F FF |                                                                                                                                                                                                                                  |
|  | Inactive | 8x 01 04 3F 10 7F FF |                                                                                                                                                                                                                                  |
|  | Active   | 8x 01 04 3F 11 7F FF |                                                                                                                                                                                                                                  |

< Additional Command >

| Command Set                                 | Command             | Command Packet             | Comments                                                                                                                                                                                                                               |
|---------------------------------------------|---------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KT_KeyAct                                   | Stop                | 8x 01 70 01 00 FF          |                                                                                                                                                                                                                                        |
|                                             | Up                  | 8x 01 70 01 21 FF          |                                                                                                                                                                                                                                        |
|                                             | Down                | 8x 01 70 01 22 FF          |                                                                                                                                                                                                                                        |
|                                             | Left                | 8x 01 70 01 23 FF          |                                                                                                                                                                                                                                        |
|                                             | Right               | 8x 01 70 01 24 FF          |                                                                                                                                                                                                                                        |
|                                             | Set                 | 8x 01 70 01 26 FF          | Enter Key                                                                                                                                                                                                                              |
|                                             | Menu Off            | 8x 01 70 01 27 FF          | Menu Off                                                                                                                                                                                                                               |
|                                             | Factory Default     | 8x 01 70 01 0F FF          | Initialize Camera Data                                                                                                                                                                                                                 |
|                                             | Auto Zoom           | 8x 01 70 01 20 FF          | Repeat TELE ~ WIDE. To stop, send the Auto Zoom command one more time                                                                                                                                                                  |
|                                             | Auto Zoom 1 time    | 8x 01 70 01 1F FF          |                                                                                                                                                                                                                                        |
| KT_DayNightMode                             | Auto                | 8x 01 70 04 00 FF          |                                                                                                                                                                                                                                        |
|                                             | Day                 | 8x 01 70 04 01 FF          |                                                                                                                                                                                                                                        |
|                                             | Night               | 8x 01 70 04 02 FF          |                                                                                                                                                                                                                                        |
|                                             | External-High       | 8x 01 70 04 03 FF          | Night = Ext. input level is High                                                                                                                                                                                                       |
|                                             | External-Low        | 8x 01 70 04 04 FF          | Night = Ext. input level is Low                                                                                                                                                                                                        |
| KT_AutoICRdelay                             | Delay Time          | 8x 01 04 41 01 00 0p 0q FF | pq: sec (0~60sec)                                                                                                                                                                                                                      |
| KT_ExtICRthreshold<br>(Ext.H or Ext.L mode) | Day->Night(EXT-H)   | 8x 01 70 05 10 0p 0q FF    | pq: ICR OFF→ON Threshold Level (Day->Night)                                                                                                                                                                                            |
|                                             | Night->Day(EXT-H)   | 8x 01 70 05 11 0p 0q FF    | pq: ICR ON→OFF Threshold Level (Night->Day)                                                                                                                                                                                            |
|                                             | Day->Night(EXT-L)   | 8x 01 70 05 20 0p 0q FF    | pq: ICR OFF→ON Threshold Level (Day->Night)                                                                                                                                                                                            |
|                                             | Night->Day(EXT-L)   | 8x 01 70 05 21 0p 0q FF    | pq: ICR ON→OFF Threshold Level (Night->Day)                                                                                                                                                                                            |
| KT_PresetAFmode                             | Display Setting OSD | 8x 01 70 02 00 FF          | Display On the Preset AF setting OSD                                                                                                                                                                                                   |
|                                             | Cancel & Exit       | 8x 01 70 02 01 FF          | Display Off the setting OSD and do not save                                                                                                                                                                                            |
|                                             | Save & Exit         | 8x 01 70 02 02 FF          | Display Off the setting OSD and save                                                                                                                                                                                                   |
|                                             | Test                | 8x 01 70 02 10 FF          | Automatically repeats TELE/WIDE                                                                                                                                                                                                        |
|                                             | Preset AF range     | 8x 01 70 03 0p 0q FF       | pq:00~FF, auto focusing range                                                                                                                                                                                                          |
| KT_AgcAutoLimit                             | -                   | 8x 01 70 34 pp FF          | pp:AGC Max Limit (0x00~0x0F) See. GAIN LIMIT table)                                                                                                                                                                                    |
| KT_Sharpness                                | -                   | 8x 01 70 53 0p FF          | p:sharpness level (0x00~0x0E)                                                                                                                                                                                                          |
| KT_AgcMode                                  | -                   | 8x 01 70 5C 0p FF          | p=1(AGC On), 0(AGC Off)                                                                                                                                                                                                                |
| KT_IrisCloseLimit                           | -                   | 8x 01 70 2B pp FF          | pp:Iris Close Limit, 0x00~0xA0<br>See. IRIS CLOSE LIMIT                                                                                                                                                                                |
| KT_ZoomFocusPreset                          | Set                 | 8x 01 70 3F 01 0p 0q 0r FF | pqr : preset Number (0x000~0x0FF)                                                                                                                                                                                                      |
|                                             | Recall              | 8x 01 70 3F 02 0p 0q 0r FF | pqr : preset Number (0x000~0x0FF)                                                                                                                                                                                                      |
|                                             | Clear               | 8x 01 70 3F 03 0p 0q 0r FF | pqr : preset Number (0x000~0x0FF)                                                                                                                                                                                                      |
|                                             | Clear All Preset    | 8x 01 70 3F 0F 00 00 00 FF | Clear all preset data                                                                                                                                                                                                                  |
| KT_HomePowerOn                              | On                  | 8x 01 70 24 02 FF          | Moving to x1 position after power on                                                                                                                                                                                                   |
|                                             | Off                 | 8x 01 70 24 03 FF          | After power on,<br>move to final position before power off                                                                                                                                                                             |
| KT_FontSize                                 | Normal              | 8x 01 70 15 30 FF          | Function OSD / Title font size                                                                                                                                                                                                         |
|                                             | Big                 | 8x 01 70 15 31 FF          |                                                                                                                                                                                                                                        |
| KT_SyncTDN_AF                               |                     | 8x 01 70 06 0p 0q FF       | AF is executed once when switching TDN<br>p : Day→Night q : Night → Day<br>0:AF OFF, 1:AF ON                                                                                                                                           |
| KT_FocusBoundary                            | Normal              | 8x 01 70 08 01 FF          | Limit the movement range to inf ~ 1cm                                                                                                                                                                                                  |
|                                             | Release             | 8x 01 70 08 00 FF          | Release the movement range of the lens                                                                                                                                                                                                 |
| KT_AeManualAutoSet                          | On                  | 8x 01 70 5D 01 FF          | When switching from AE AUTO to MANUAL mode, the manual agc / iris / shutter level is set to the current brightness                                                                                                                     |
|                                             | Off                 | 8x 01 70 5D 00 FF          |                                                                                                                                                                                                                                        |
| KT_WbManualAutoSet                          | On                  | 8x 01 70 26 01 FF          | When switching from WB AUTO to MANUAL mode, the manual red/blue gain is set to the current color                                                                                                                                       |
|                                             | Off                 | 8x 01 70 26 00 FF          |                                                                                                                                                                                                                                        |
| KT_Adj_Color                                | -                   | 8x 01 70 25 pq 0r 0s FF    | p : (0)direct setting (1)increase (2)decrease<br>q : (1)BYGAIN- (2)BYGAIN+ (3)RYGAIN- (4)RYGAIN+<br>(5)BYHUE-(6)BYHUE+(7)RYHUE-(8)RYHUE+<br>(9)RED GAIN (A)GREEN GAIN (B)BLUE GAIN<br>(F)Factory default<br>rs : direct value (if p=0) |

# Inquiry Command List

| Inquiry Command          | Command Packet | Inquiry Packet                   | Comments                                |
|--------------------------|----------------|----------------------------------|-----------------------------------------|
| CAM_PowerInq             | 8x 09 04 00 FF | y0 50 02 FF                      | On                                      |
|                          |                | y0 50 03 FF                      | Off (Standby)                           |
| CAM_ZoomPosInq           | 8x 09 04 47 FF | y0 50 0p 0q 0r 0s FF             | pqrs: Zoom Position                     |
| CAM_DZoomModeInq         | 8x 09 04 06 FF | y0 50 02 FF                      | D-Zoom On                               |
|                          |                | y0 50 03 FF                      | D-Zoom Off                              |
| CAM_DZoomC/SModeInq      | 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_FocusModeInq         | 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 Position         |
| CAM_AFSensitivityInq     | 8x 09 04 58 FF | y0 50 02 FF                      | AF Sensitivity Normal                   |
|                          |                | y0 50 03 FF                      | AF Sensitivity Low                      |
| CAM_AFModeInq            | 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_AFTimeSettingInq     | 8x 09 04 27 FF | y0 50 0p 0q 0r 0s FF             | pq: Movement Time, rs: Interval         |
| CAM_IRCorrectionInq      | 8x 09 04 11 FF | y0 50 00 FF                      | Standard                                |
|                          |                | y0 50 01 FF                      | IR Light                                |
| CAM_WBModeInq            | 8x 09 04 35 FF | y0 50 00 FF                      | Auto                                    |
|                          |                | y0 50 01 FF                      | In Door                                 |
|                          |                | y0 50 02 FF                      | Out Door                                |
|                          |                | y0 50 03 FF                      | One Push WB                             |
|                          |                | y0 50 04 FF                      | ATW                                     |
|                          |                | y0 50 05 FF                      | Manual                                  |
| CAM_RGainInq             | 8x 09 04 43 FF | y0 50 00 00 0p 0q FF             | pq: R Gain                              |
| CAM_BGainInq             | 8x 09 04 44 FF | y0 50 00 00 0p 0q FF             | pq: B Gain                              |
| CAM_AEModeInq            | 8x 09 04 39 FF | y0 50 00 FF                      | Full Auto                               |
|                          |                | y0 50 03 FF                      | Manual                                  |
|                          |                | y0 50 0A FF                      | Shutter Priority                        |
|                          |                | y0 50 0B FF                      | Iris Priority                           |
|                          |                | y0 50 0D FF                      | Bright                                  |
| CAM_SlowShutterModeInq   | 8x 09 04 5A FF | y0 50 02 FF                      | Auto                                    |
|                          |                | y0 50 03 FF                      | Manual                                  |
| 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_GainLimitInq         | 8x 09 04 2C FF | y0 50 0q FF                      | p: Gain Limit                           |
| CAM_BrightPosInq         | 8x 09 04 4D FF | y0 50 00 00 0p 0q FF             | pq: Bright Position                     |
| CAM_ExpCompModeInq       | 8x 09 04 3E FF | y0 50 02 FF                      | On                                      |
|                          |                | y0 50 03 FF                      | Off                                     |
| CAM_ExpCompPosInq        | 8x 09 04 4E FF | y0 50 00 00 0p 0q FF             | pq: ExpComp Position                    |
| CAM_BackLightModeInq     | 8x 09 04 33 FF | y0 50 02 FF                      | On                                      |
|                          |                | y0 50 03 FF                      | Off                                     |
| CAM_AE_ResponseInq       | 8x 09 04 5D FF | y0 50 pp FF                      | pp: 01 to 20 (hex)                      |
| CAM_WDModeInq            | 8x 09 04 3D FF | y0 50 02 FF                      | On Wide-D                               |
|                          |                | y0 50 03 FF                      | Off                                     |
| CAM_WDParameterInq       | 8x 09 04 2D FF | y0 50 00 00 00 0s 00 00 00 00 FF | s: Blown-out highlight correction level |
| CAM_ApertureInq          | 8x 09 04 42 FF | y0 50 00 00 0p 0q FF             | pq: Aperture Gain                       |
| CAM_HRModeInq            | 8x 09 04 52 FF | y0 50 02 FF                      | On (Hi-Resolution)                      |
|                          |                | y0 50 03 FF                      | Off                                     |
| CAM_NRModeInq            | 8x 09 04 53 FF | y0 50 0p FF                      | Noise Reduction p: 0 to 5               |
| CAM_GammaInq             | 8x 09 04 5B FF | y0 50 0p FF                      | Gamma p: 0 to 6                         |
| CAM_HighSensitivityInq   | 8x 09 04 5E FF | y0 50 02 FF                      | On                                      |
|                          |                | y0 50 03 FF                      | Off                                     |
| CAM_LR_ReverseModeInq    | 8x 09 04 61 FF | y0 50 02 FF                      | On                                      |
|                          |                | y0 50 03 FF                      | Off                                     |
| CAM_FreezeModeInq        | 8x 09 04 62 FF | y0 50 02 FF                      | On                                      |
|                          |                | y0 50 03 FF                      | Off                                     |
| CAM_PictureEffectModeInq | 8x 09 04 63 FF | y0 50 00 FF                      | Off                                     |
|                          |                | y0 50 02 FF                      | Neg.Art                                 |

|                                        |                                    |                                         |                                                                                                                                                                                                              |
|----------------------------------------|------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |                                    | y0 50 04 FF                             | B&W                                                                                                                                                                                                          |
| CAM_PictureFlipModeInq                 | 8x 09 04 66 FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_ICRModeInq                         | 8x 09 04 01 FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_AutoICRModeInq                     | 8x 09 04 51 FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_AutoICRThresholdInq                | 8x 09 04 21 FF                     | y0 50 00 00 0p 0q FF                    | pq: ICR ON → OFF Threshold Level                                                                                                                                                                             |
| CAM_AutoICRAAlarmReplyInq              | 8x 09 04 31 FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_MemSaveInq                         | 8x 09 04 23 0X FF                  | y0 50 0p 0p 0q 0q FF                    | X: 00 to 07 (Address)<br>ppqq: 0x0000 to 0xFFFF (Data)                                                                                                                                                       |
| CAM_DisplayModeInq                     | 8x 09 04 15 FF<br>(8x 09 06 06 FF) | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_MuteModeInq                        | 8x 09 04 75 FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_PrivacyDisplayInq                  | 8x 09 04 77 FF                     | y0 50 pp pp pp pp FF                    | pp pp pp pp: Mask Display (0: OFF, 1: ON)                                                                                                                                                                    |
| CAM_PrivacyPanTiltInq                  | 8x 09 04 79 FF                     | y0 50 0p 0p 0p 0q 0q 0q FF              | ppp: Pan qq: Tilt                                                                                                                                                                                            |
| CAM_PrivacyPTZInq                      | 8x 09 04 7B mm FF                  | y0 50 0p 0p 0p 0q 0q 0r 0r<br>0r 0r FF  | mm: Mask Settings ppp: Pan<br>qq: Tilt rrr: Zoom                                                                                                                                                             |
| CAM_PrivacyMonitorInq                  | 8x 09 04 6F FF                     | y0 50 pp pp pp pp FF                    | pp pp pp pp: Mask is displayed now.                                                                                                                                                                          |
| CAM_IDInq                              | 8x 09 04 22 FF                     | y0 50 0p 0q 0r 0s FF                    | pqr: Camera ID                                                                                                                                                                                               |
| CAM_VersionInq                         | 8x 09 00 02 FF                     | y0 50 00 <b>78</b><br>mn pq rs tu vw FF | mnpq: Model Code (04xx)<br>rstu: ROM version<br>vw: Socket Number (=02)<br>See. "Cam_VersionInq"                                                                                                             |
| CAM_MDModeInq                          | 8x 09 04 1B FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_MDFunctionInq                      | 8x 09 04 1C FF                     | y0 50 0m 0n 0p 0q 0r 0s FF              | m: Display mode<br>n: Detection Frame Set (0 to F) pq: Threshold<br>Level (0 to FF) rs: Interval Time set (0 to FF)                                                                                          |
| CAM_MDWindowInq                        | 8x 09 04 1D 0m FF                  | y0 50 0p 0q 0r 0s FF                    | m: Select Detection Frame (0, 1, 2, 3) p: Start<br>Horizontal Position (00 to 0B) q: Start Vertical<br>Position (00 to 07)<br>r: Stop Horizontal Position (01 to 0C) s: Stop<br>Vertical Position (01 to 08) |
| CAM_ContinuousZoomPos<br>ReplyModeInq  | 8x 09 04 69 FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_ZoomPosReplyIntervalT<br>imeInq    | 8x 09 04 6A FF                     | y0 50 00 00 0p 0p FF                    | pp: Interval Time                                                                                                                                                                                            |
| CAM_ContinuousFocusPos<br>ReplyModeInq | 8x 09 04 16 FF                     | y0 50 02 FF                             | On                                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Off                                                                                                                                                                                                          |
| CAM_FocusPosReplyIntervalT<br>imeInq   | 8x 09 04 1A FF                     | y0 50 00 00 0p 0p FF                    | pp: Interval Time                                                                                                                                                                                            |
| CAM_ExAutoICRThresholdIn<br>q          | 8x 09 04 1F 21 00 FF               | y0 50 00 00 0p 0q FF                    | pq : ICR ON→OFF threshold when Auto ICR<br>is on (Night → Day)                                                                                                                                               |
| CAM_ExAutoICRONLevelInq                | 8x 09 04 1F 21 01 FF               | y0 50 00 00 0p 0q FF                    | pq : ICR OFF→ON threshold when Auto ICR<br>is on (Day → Night)                                                                                                                                               |
| CAM_RegisterValueInq                   | 8x 09 04 24 mm FF                  | y0 50 0p 0p FF                          | mm: Register No. (00 to 7F) pp: Register<br>Value (00 to FF)                                                                                                                                                 |
| CAM_ColorGainInq                       | 8x 09 04 49 FF                     | y0 50 00 00 00 0p FF                    | p: Color Gain setting 0h (60%) to Eh (200%)                                                                                                                                                                  |
| CAM_ColorHueInq                        | 8x 09 04 4F FF                     | y0 50 00 00 00 0p FF                    | p: Color Hue setting 0h (- 14 degrees) to Eh<br>(+ 14 degrees)                                                                                                                                               |
| CAM_StabilizerInq                      | 8x 09 04 34 FF                     | y0 50 02 FF                             | Stabilizer(DIS) on                                                                                                                                                                                           |
|                                        |                                    | y0 50 03 FF                             | Stabilizer(DIS) off                                                                                                                                                                                          |
| CAM_DefogInq                           | 8x 09 04 37 FF                     | y0 50 02 0p FF                          | Defog On,<br>p:defog level(1:low,2:middle,3:high)                                                                                                                                                            |
|                                        |                                    | y0 50 03 00 FF                          | Defog Off                                                                                                                                                                                                    |
| CAM_HLCInq                             | 8x 09 04 14 FF                     | y0 50 0p 0q FF                          | p:HLC Level (0:Off, 1:On)<br>q:HLC mask level(0:Off, 1(low)-F(high)                                                                                                                                          |
| CAM_SpotAEModeInq                      | 8x 09 04 59 FF                     | y0 50 02 FF                             | Spot AE on                                                                                                                                                                                                   |
|                                        |                                    | y0 50 03 FF                             | Spot AE Off                                                                                                                                                                                                  |
| CAM_SpotAEPoSInq                       | 8x 09 04 29 FF                     | y0 50 0p 0q 0r 0s FF                    | pq:X(0-F), rs:Y(0-F)                                                                                                                                                                                         |
| CAM_MemoryInq                          | 8x 09 04 3F FF                     | y0 50 pp FF                             | pp:memory number recalled last                                                                                                                                                                               |

< Additional Inquiry >

| Inquiry Command       | Command Packet         | Inquiry Packet                | Comments                                                                                                                                                  |
|-----------------------|------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| KT_MenuOnOffInq       | 8x 09 70 01 FF         | y0 50 02 FF                   | Menu on                                                                                                                                                   |
|                       |                        | y0 50 03 FF                   | Menu off                                                                                                                                                  |
| KT_DayNightModelInq   | 8x 09 70 04 FF         | y0 50 0p 0q FF                | pq:day&night mode                                                                                                                                         |
| KT_ExtICRthresholdInq | 8x 09 70 05 10 FF      | y0 50 0p 0q FF                | pq:ext-H day->night threshold                                                                                                                             |
|                       | 8x 09 70 05 11 FF      | y0 50 0p 0q FF                | pq:ext-H night->day threshold                                                                                                                             |
|                       | 8x 09 70 05 20 FF      | y0 50 0p 0q FF                | pq:ext-L day->night threshold                                                                                                                             |
|                       | 8x 09 70 05 21 FF      | y0 50 0p 0q FF                | pq:ext-L night->day threshold                                                                                                                             |
| KT_PresetAFRangeInq   | 8x 09 70 03 FF         | y0 50 0p 0q FF                | pq: preset AF range                                                                                                                                       |
| KT_AgcAutoLimitInq    | 8x 09 70 34 FF         | y0 50 pp FF                   | pp:AGC Max Limit (See. GAIN LIMIT table)                                                                                                                  |
| KT_SharpnessInq       | 8x 09 70 53 FF         | y0 50 0p FF                   | p:sharpness level (0x00~0x0F)                                                                                                                             |
| KT_AgcModeInq         | 8x 09 70 5C FF         | y0 50 0p FF                   | p:1(AGC On),0(AGC Off)                                                                                                                                    |
| KT_IrisCloseLimitInq  | 8x 09 70 2B FF         | y0 50 0p 0q FF                | pq:Iris Close Limit, 0x00~0xA0                                                                                                                            |
| KT_ZoomFocusPresetInq | 8x 09 703F 0n 0n 0n FF | y0 50 0v 0z 0z 0z 0f 0f 0f FF | nnn:preset number(0x000~0x0FF)<br>v : 1(saved), 0(empty)<br>zzzz : zoom position<br>ffff : focus position                                                 |
| KT_HomePowerOnInq     | 8x 09 70 24 FF         | y0 50 0p FF                   | p:Home Position Mode, 2(ON)/3(OFF)                                                                                                                        |
| KT_CustomPresetInq    | 8x 09 70 3E FF         | y0 50 0p FF                   | p: 1(custom preset activate)<br>0(custom preset inactive)                                                                                                 |
| KT_FontSizeInq        | 8x 09 70 15 FF         | y0 50 0p FF                   | p: 0(Normal Size) / 1(Big Size)                                                                                                                           |
| KT_SyncTDN_AFinq      | 8x 09 70 06 FF         | y0 50 0p 0q FF                | p : Day→Night q : Night → Day<br>0:AF OFF, 1:AF ON                                                                                                        |
| KT_FocusBoundaryInq   | 8x 09 70 08 FF         | y0 50 0p FF                   | P: (0)Normal, (1)Release                                                                                                                                  |
| KT_AeManualAutoSetInq | 8x 09 70 5D FF         | y0 50 0p FF                   | P: (0)Off, (1)On                                                                                                                                          |
| KT_WbManualAutoSetInq | 8x 09 70 26 FF         | y0 50 0p FF                   | P: (0)Off, (1)On                                                                                                                                          |
| KT_Adj_ColorInq       | 8x 09 70 25 0p FF      | y0 50 0r 0s FF                | p : (1)BYGAIN- (2)BYGAIN+<br>(3)RYGAIN- (4)RYGAIN+<br>(5)BYHUE-(6)BYHUE+<br>(7)RYHUE-(8)RYHUE+<br>(9)RED GAIN (A)GREEN GAIN<br>(B)BLUE GAIN<br>rs : value |

# Lens Control System Inquiry Commands ..... Command Packet 8x097E7E00FF

| Byte | Bit | Comments             |
|------|-----|----------------------|
| 0    | 7   | Destination Address  |
|      | 6   |                      |
|      | 5   |                      |
|      | 4   |                      |
|      | 3   | Source Address       |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 1    | 7   | 0 Completion Message |
|      | 6   | 1                    |
|      | 5   | 0                    |
|      | 4   | 1                    |
|      | 3   | 0                    |
|      | 2   | 0                    |
|      | 1   | 0                    |
|      | 0   | 0                    |
| 2    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Zoom Position (HH)   |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 3    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Zoom Position (HL)   |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 4    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Zoom Position (LH)   |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 5    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Zoom Position (LL)   |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |

| Byte | Bit | Comments             |
|------|-----|----------------------|
| 6    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Focus Near Limit (H) |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 7    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Focus Near Limit (L) |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 8    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Focus Position (HH)  |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 9    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Focus Position (HL)  |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 10   | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Focus Position (LH)  |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 11   | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | Focus Position (LL)  |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |

| Byte | Bit | Comment                                  |
|------|-----|------------------------------------------|
| 12   | 7   | 0                                        |
|      | 6   | 0                                        |
|      | 5   | 0                                        |
|      | 4   | 0                                        |
|      | 3   | 0                                        |
|      | 2   | 0                                        |
|      | 1   | 0                                        |
|      | 0   | 0                                        |
| 13   | 7   | 0                                        |
|      | 6   | 0                                        |
|      | 5   | DZoomMode 0: Combine<br>1: Separate      |
|      | 4   | 0: Normal 1: Interval                    |
|      | 3   | 2: Zoom Trigger                          |
|      | 2   | AF Sensitivity 0:<br>Slow 1: Normal      |
|      | 1   | Digital Zoom 1: On 0: Off                |
|      | 0   | Focus Mode 0: Manual 1: Auto             |
| 14   | 7   | 0                                        |
|      | 6   | 0                                        |
|      | 5   | 0                                        |
|      | 4   | 0                                        |
|      | 3   | Low Contrast Detection 1:<br>Yes 0: No   |
|      | 2   | Camera Memory<br>Recall 1: Executing 0:  |
|      | 1   | Focus Command 1:<br>Executing 0: Stopped |
|      | 0   | Zoom Command 1:<br>Executing 0: Stopped  |
| 15   | 7   | 1 Terminator (FFh)                       |
|      | 6   | 1                                        |
|      | 5   | 1                                        |
|      | 4   | 1                                        |
|      | 3   | 1                                        |
|      | 2   | 1                                        |
|      | 1   | 1                                        |
|      | 0   | 1                                        |

# Camera Control System Inquiry Commands ..... Command Packet 8x09 7E 7E 01 FF

| Byte | Bit | Comments             |
|------|-----|----------------------|
| 0    | 7   | Destination Address  |
|      | 6   |                      |
|      | 5   |                      |
|      | 4   |                      |
|      | 3   | Source Address       |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 1    | 7   | 0 Completion Message |
|      | 6   | 1                    |
|      | 5   | 0                    |
|      | 4   | 1                    |
|      | 3   | 0                    |
|      | 2   | 0                    |
|      | 1   | 0                    |
|      | 0   | 0                    |
| 2    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | R Gain (H)           |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 3    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | R Gain (L)           |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 4    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | B Gain (H)           |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 5    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | B Gain (L)           |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |

| Byte | Bit | Comments                           |
|------|-----|------------------------------------|
| 6    | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | 0                                  |
|      | 3   | WB Mode                            |
|      | 2   |                                    |
|      | 1   |                                    |
|      | 0   |                                    |
| 7    | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | 0                                  |
|      | 3   | Aperture Gain                      |
|      | 2   |                                    |
|      | 1   |                                    |
|      | 0   |                                    |
| 8    | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | Exposure Mode                      |
|      | 3   |                                    |
|      | 2   |                                    |
|      | 1   |                                    |
|      | 0   |                                    |
| 9    | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | High-Resolution 1: On 0: Off       |
|      | 4   | Wide-D (1: Other than Off, 0: Off) |
|      | 3   | 0                                  |
|      | 2   | Back Light 1: On 0: Off            |
|      | 1   | Exposure Comp. 1: On 0: Off        |
|      | 0   | Slow Shutter 1: Auto 0:            |
| 10   | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | Shutter Position                   |
|      | 3   |                                    |
|      | 2   |                                    |
|      | 1   |                                    |
|      | 0   |                                    |
| 11   | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | Iris Position                      |
|      | 3   |                                    |
|      | 2   |                                    |
|      | 1   |                                    |
|      | 0   |                                    |

| Byte | Bit | Comments                |
|------|-----|-------------------------|
| 12   | 7   | 0                       |
|      | 6   | 0                       |
|      | 5   | 0                       |
|      | 4   | 0                       |
|      | 3   | Gain Position           |
|      | 2   |                         |
|      | 1   |                         |
|      | 0   |                         |
| 13   | 7   | 0                       |
|      | 6   | 0                       |
|      | 5   | 0                       |
|      | 4   | Bright Position         |
|      | 3   |                         |
|      | 2   |                         |
|      | 1   |                         |
|      | 0   |                         |
| 14   | 7   | 0                       |
|      | 6   | 0                       |
|      | 5   | 0                       |
|      | 4   | 0                       |
|      | 3   | Exposure Comp. Position |
|      | 2   |                         |
|      | 1   |                         |
|      | 0   |                         |
| 15   | 7   | 1 Terminator (FFh)      |
|      | 6   | 1                       |
|      | 5   | 1                       |
|      | 4   | 1                       |
|      | 3   | 1                       |
|      | 2   | 1                       |
|      | 1   | 1                       |
|      | 0   | 1                       |

# Other Inquiry Commands .....Command Packet 8x097E7E02FF

| Byte | Bit | Comments                       |
|------|-----|--------------------------------|
| 0    | 7   | Destination Address            |
|      | 6   |                                |
|      | 5   |                                |
|      | 4   |                                |
|      | 3   | Source Address                 |
|      | 2   |                                |
|      | 1   |                                |
|      | 0   |                                |
| 1    | 7   | 0 Completion Message           |
|      | 6   | 1                              |
|      | 5   | 0                              |
|      | 4   | 1                              |
|      | 3   | 0                              |
|      | 2   | 0                              |
|      | 1   | 0                              |
|      | 0   | 0                              |
| 2    | 7   | 0                              |
|      | 6   | 0                              |
|      | 5   | 0                              |
|      | 4   | 0                              |
|      | 3   | Auto ICR Alarm (1: On, 0: Off) |
|      | 2   | Auto ICR 1: On 0: Off          |
|      | 1   | 0                              |
|      | 0   | Power 1: On 0: Off             |
| 3    | 7   | 0                              |
|      | 6   | 0                              |
|      | 5   | 0                              |
|      | 4   | ICR 1: On 0: Off               |
|      | 3   | Freeze 1: On 0: Off            |
|      | 2   | LR Reverse 1: On 0: Off        |
|      | 1   | 0                              |
|      | 0   | 0                              |
| 4    | 7   | 0                              |
|      | 6   | 0                              |
|      | 5   | Privacy Zone 1: On 0: Off      |
|      | 4   | Mute 1: On 0: Off              |
|      | 3   | Title Display 1: On 0: Off     |
|      | 2   | Display 1: On 0: Off           |
|      | 1   | 0                              |
|      | 0   | 0                              |
| 5    | 7   | 0                              |
|      | 6   | 0                              |
|      | 5   | 0                              |
|      | 4   | 0                              |
|      | 3   | Picture Effect Mode            |
|      | 2   |                                |
|      | 1   |                                |
|      | 0   |                                |

| Byte | Bit | Comments       |
|------|-----|----------------|
| 6    | 7   | 0              |
|      | 6   | 0              |
|      | 5   | 0              |
|      | 4   | 0              |
|      | 3   | 0              |
|      | 2   | 0              |
|      | 1   | 0              |
|      | 0   | 0              |
| 7    | 7   | 0              |
|      | 6   | 0              |
|      | 5   | 0              |
|      | 4   | 0              |
|      | 3   | 0              |
|      | 2   | 0              |
|      | 1   | 0              |
|      | 0   | 0              |
| 8    | 7   | 0              |
|      | 6   | 0              |
|      | 5   | 0              |
|      | 4   | 0              |
|      | 3   | Camera ID (HH) |
|      | 2   |                |
|      | 1   |                |
|      | 0   |                |
| 9    | 7   | 0              |
|      | 6   | 0              |
|      | 5   | 0              |
|      | 4   | 0              |
|      | 3   | Camera ID (HL) |
|      | 2   |                |
|      | 1   |                |
|      | 0   |                |
| 10   | 7   | 0              |
|      | 6   | 0              |
|      | 5   | 0              |
|      | 4   | 0              |
|      | 3   | Camera ID (LH) |
|      | 2   |                |
|      | 1   |                |
|      | 0   |                |
| 11   | 7   | 0              |
|      | 6   | 0              |
|      | 5   | 0              |
|      | 4   | 0              |
|      | 3   | Camera ID (LL) |
|      | 2   |                |
|      | 1   |                |
|      | 0   |                |

| Byte | Bit | Comments                           |
|------|-----|------------------------------------|
| 12   | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | Memory 1: Provided 0: Not provided |
|      | 3   | 0                                  |
|      | 2   | ICR 1: Provided 0: Not provided    |
|      | 1   | Stabilizer                         |
|      | 0   | 1:provided, 0: not provided        |
| 13   | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | 0                                  |
|      | 3   | Day&Night Mode                     |
|      | 2   |                                    |
|      | 1   |                                    |
|      | 0   |                                    |
| 14   | 7   | 0                                  |
|      | 6   | 0                                  |
|      | 5   | 0                                  |
|      | 4   | 0                                  |
|      | 3   | 0                                  |
|      | 2   | 0                                  |
|      | 1   | 0                                  |
|      | 0   | 0                                  |
| 15   | 7   | 1 Terminator (FFh)                 |
|      | 6   | 1                                  |
|      | 5   | 1                                  |
|      | 4   | 1                                  |
|      | 3   | 1                                  |
|      | 2   | 1                                  |
|      | 1   | 1                                  |
|      | 0   | 1                                  |



# Enlargement Function1 Query Command..... Command Packet 8x 09 7E 7E 03 FF

| Byte | Bit | Comments                  |
|------|-----|---------------------------|
| 0    | 7   | Destination Address       |
|      | 6   |                           |
|      | 5   |                           |
|      | 4   |                           |
|      | 3   | Source Address            |
|      | 2   |                           |
|      | 1   |                           |
|      | 0   |                           |
| 1    | 7   | 0 Completion Message      |
|      | 6   | 1                         |
|      | 5   | 0                         |
|      | 4   | 1                         |
|      | 3   | 0                         |
|      | 2   | 0                         |
|      | 1   | 0                         |
|      | 0   | 0                         |
| 2    | 7   | 0                         |
|      | 6   | 0                         |
|      | 5   | 0                         |
|      | 4   | 0                         |
|      | 3   | Digital Zoom Position (H) |
|      | 2   |                           |
|      | 1   |                           |
|      | 0   |                           |
| 3    | 7   | 0                         |
|      | 6   | 0                         |
|      | 5   | 0                         |
|      | 4   | 0                         |
|      | 3   | Digital Zoom Position (L) |
|      | 2   |                           |
|      | 1   |                           |
|      | 0   |                           |
| 4    | 7   | 0                         |
|      | 6   | 0                         |
|      | 5   | 0                         |
|      | 4   | 0                         |
|      | 3   | AF Activation Time (H)    |
|      | 2   |                           |
|      | 1   |                           |
|      | 0   |                           |
| 5    | 7   | 0                         |
|      | 6   | 0                         |
|      | 5   | 0                         |
|      | 4   | 0                         |
|      | 3   | AF Activation Time (L)    |
|      | 2   |                           |
|      | 1   |                           |
|      | 0   |                           |

| Byte | Bit | Comments                     |
|------|-----|------------------------------|
| 6    | 7   | 0                            |
|      | 6   | 0                            |
|      | 5   | 0                            |
|      | 4   | 0                            |
|      | 3   | AF Interval Time (H)         |
|      | 2   |                              |
|      | 1   |                              |
|      | 0   |                              |
| 7    | 7   | 0                            |
|      | 6   | 0                            |
|      | 5   | 0                            |
|      | 4   | 0                            |
|      | 3   | AF Interval Time (L)         |
|      | 2   |                              |
|      | 1   |                              |
|      | 0   |                              |
| 8    | 7   | 0                            |
|      | 6   | 0                            |
|      | 5   | 0                            |
|      | 4   | 0                            |
|      | 3   | 0                            |
|      | 2   |                              |
|      | 1   |                              |
|      | 0   |                              |
| 9    | 7   | 0                            |
|      | 6   | 0                            |
|      | 5   | 0                            |
|      | 4   | 0                            |
|      | 3   | 0                            |
|      | 2   |                              |
|      | 1   |                              |
|      | 0   |                              |
| 10   | 7   | 0                            |
|      | 6   | 0                            |
|      | 5   | 0                            |
|      | 4   | 0                            |
|      | 3   | 0                            |
|      | 2   | MD (1: On, 0: Off)           |
|      | 1   | Reserved                     |
|      | 0   | Picture flip (1: On, 0: Off) |

| Byte | Bit | Comments                                        |
|------|-----|-------------------------------------------------|
| 11   | 7   | 0                                               |
|      | 6   | Color Gain (0h (60%) to Eh (200%))              |
|      | 5   |                                                 |
|      | 4   |                                                 |
|      | 3   | Advanced Privacy (1: Provided, 0: Not provided) |
|      | 2   |                                                 |
|      | 1   | Alarm (1: Provided, 0: Not provided)            |
|      | 0   | Picture flip (1: Provided, 0: Not provided)     |
| 12   | 7   | 0                                               |
|      | 6   | 0                                               |
|      | 5   | 0                                               |
|      | 4   | 0                                               |
|      | 3   |                                                 |
|      | 2   |                                                 |
|      | 1   |                                                 |
|      | 0   |                                                 |
| 13   | 7   | 0                                               |
|      | 6   | Gamma                                           |
|      | 5   |                                                 |
|      | 4   |                                                 |
|      | 3   | High Sensitivity mode (1: ON, 0: OFF)           |
|      | 2   | NR Level                                        |
|      | 1   |                                                 |
|      | 0   |                                                 |
| 14   | 7   | 0                                               |
|      | 6   | 0                                               |
|      | 5   |                                                 |
|      | 4   |                                                 |
|      | 3   | Gain Limit                                      |
|      | 2   |                                                 |
|      | 1   |                                                 |
|      | 0   |                                                 |
| 15   | 7   | 1 Terminator (FFh)                              |
|      | 6   | 1                                               |
|      | 5   | 1                                               |
|      | 4   | 1                                               |
|      | 3   | 1                                               |
|      | 2   | 1                                               |
|      | 1   | 1                                               |
|      | 0   | 1                                               |

# Enlargement Function2 Query Command..... Command Packet 8x 09 7E 7E 04 FF

| Byte | Bit | Comm                                                         |
|------|-----|--------------------------------------------------------------|
| 0    | 7   | Destination Address                                          |
|      | 6   |                                                              |
|      | 5   |                                                              |
|      | 4   |                                                              |
|      | 3   | Source Address                                               |
|      | 2   |                                                              |
|      | 1   |                                                              |
|      | 0   |                                                              |
| 1    | 7   | 0 Completion Message                                         |
|      | 6   | 1                                                            |
|      | 5   | 0                                                            |
|      | 4   | 1                                                            |
|      | 3   | 0                                                            |
|      | 2   | 0                                                            |
|      | 1   | 0                                                            |
|      | 0   | 0                                                            |
| 2    | 7   | 0                                                            |
|      | 6   | 0                                                            |
|      | 5   | 0                                                            |
|      | 4   | 0                                                            |
|      | 3   | 0                                                            |
|      | 2   | WideD mode (0: OFF, 1: ON)                                   |
|      | 1   |                                                              |
|      | 0   |                                                              |
| 3    | 7   | 0                                                            |
|      | 6   | 0                                                            |
|      | 5   | 0                                                            |
|      | 4   | 0                                                            |
|      | 3   | 0                                                            |
|      | 2   |                                                              |
|      | 1   | 0                                                            |
|      | 0   | 0                                                            |
| 4    | 7   | 0                                                            |
|      | 6   | 0                                                            |
|      | 5   | 0                                                            |
|      | 4   | 0                                                            |
|      | 3   | 0                                                            |
|      | 2   |                                                              |
|      | 1   | WideD blown-out highlight<br>correction level 0: L 1: M 2: H |
|      | 0   |                                                              |
| 5    | 7   | 0                                                            |
|      | 6   | 0                                                            |
|      | 5   | 0                                                            |
|      | 4   | 0                                                            |
|      | 3   | 0                                                            |
|      | 2   |                                                              |
|      | 1   |                                                              |
|      | 0   |                                                              |

| Byte | Bit | Comments               |
|------|-----|------------------------|
| 6    | 7   | 0                      |
|      | 6   | 0                      |
|      | 5   | 0                      |
|      | 4   | 0                      |
|      | 3   | 0                      |
|      | 2   |                        |
|      | 1   |                        |
|      | 0   |                        |
| 7    | 7   | 0                      |
|      | 6   | 0                      |
|      | 5   | 0                      |
|      | 4   | 0                      |
|      | 3   | 0                      |
|      | 2   | 0                      |
|      | 1   | 0                      |
|      | 0   | Defog Mode(1:on,0:off) |
| 8    | 7   | 0                      |
|      | 6   | 0                      |
|      | 5   | 0                      |
|      | 4   | 0                      |
|      | 3   | 0                      |
|      | 2   | 0                      |
|      | 1   | 0                      |
|      | 0   | 0                      |
| 9    | 7   | 0                      |
|      | 6   | 0                      |
|      | 5   | 0                      |
|      | 4   | 0                      |
|      | 3   | 0                      |
|      | 2   | 0                      |
|      | 1   | 0                      |
|      | 0   | 0                      |
| 10   | 7   | 0                      |
|      | 6   | 0                      |
|      | 5   | 0                      |
|      | 4   | 0                      |
|      | 3   | 0                      |
|      | 2   | 0                      |
|      | 1   | 0                      |
|      | 0   | 0                      |

| Byte | Bit | Comments           |
|------|-----|--------------------|
| 11   | 7   | 0                  |
|      | 6   | 0                  |
|      | 5   | 0                  |
|      | 4   | 0                  |
|      | 3   | 0                  |
|      | 2   | 0                  |
|      | 1   | 0                  |
|      | 0   | 0                  |
| 12   | 7   | 0                  |
|      | 6   | 0                  |
|      | 5   | 0                  |
|      | 4   | 0                  |
|      | 3   | 0                  |
|      | 2   | 0                  |
|      | 1   | 0                  |
|      | 0   | 0                  |
| 13   | 7   | 0                  |
|      | 6   | 0                  |
|      | 5   | 0                  |
|      | 4   | 0                  |
|      | 3   | 0                  |
|      | 2   | 0                  |
|      | 1   | 0                  |
|      | 0   | 0                  |
| 14   | 7   | 0                  |
|      | 6   | 0                  |
|      | 5   | 0                  |
|      | 4   | 0                  |
|      | 3   | 0                  |
|      | 2   | 0                  |
|      | 1   | 0                  |
|      | 0   | 0                  |
| 15   | 7   | 1 Terminator (FFh) |
|      | 6   | 1                  |
|      | 5   | 1                  |
|      | 4   | 1                  |
|      | 3   | 1                  |
|      | 2   | 1                  |
|      | 1   | 1                  |
|      | 0   | 1                  |

# Enlargement Function3 Query Command..... Command Packet 8x 09 7E 7E 05 FF

| Byte | Bit | Comments             |
|------|-----|----------------------|
| 0    | 7   | Destination Address  |
|      | 6   |                      |
|      | 5   |                      |
|      | 4   |                      |
|      | 3   | Source Address       |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 1    | 7   | 0 Completion Message |
|      | 6   | 1                    |
|      | 5   | 0                    |
|      | 4   | 1                    |
|      | 3   | 0                    |
|      | 2   | 0                    |
|      | 1   | 0                    |
|      | 0   | 0                    |
| 2    | 7   | 0                    |
|      | 6   | 0                    |
|      | 5   | 0                    |
|      | 4   | 0                    |
|      | 3   | 0                    |
|      | 2   |                      |
|      | 1   |                      |
|      | 0   |                      |
| 3    | 7   | 0                    |
|      | 6   | Reserved             |
|      | 5   |                      |
|      | 4   |                      |
|      | 3   |                      |
|      | 2   | Reserved             |
|      | 1   |                      |
|      | 0   |                      |
| 4    | 7   | 0                    |
|      | 6   | Reserved             |
|      | 5   |                      |
|      | 4   |                      |
|      | 3   |                      |
|      | 2   | Reserved             |
|      | 1   |                      |
|      | 0   |                      |
| 5    | 7   | 0                    |
|      | 6   | Reserved             |
|      | 5   |                      |
|      | 4   |                      |
|      | 3   |                      |
|      | 2   | Reserved             |
|      | 1   |                      |
|      | 0   |                      |

| Byte | Bit | Comment  |
|------|-----|----------|
| 6    | 7   | 0        |
|      | 6   | Reserved |
|      | 5   |          |
|      | 4   |          |
|      | 3   |          |
|      | 2   | Reserved |
|      | 1   |          |
|      | 0   |          |
| 7    | 7   | 0        |
|      | 6   | Reserved |
|      | 5   |          |
|      | 4   |          |
|      | 3   |          |
|      | 2   | Reserved |
|      | 1   |          |
|      | 0   |          |
| 8    | 7   | 0        |
|      | 6   | Reserved |
|      | 5   |          |
|      | 4   |          |
|      | 3   |          |
|      | 2   | Reserved |
|      | 1   |          |
|      | 0   |          |
| 9    | 7   | 0        |
|      | 6   | Reserved |
|      | 5   |          |
|      | 4   |          |
|      | 3   |          |
|      | 2   | Reserved |
|      | 1   |          |
|      | 0   |          |
| 10   | 7   | 0        |
|      | 6   | Reserved |
|      | 5   |          |
|      | 4   |          |
|      | 3   |          |
|      | 2   | Reserved |
|      | 1   |          |
|      | 0   |          |

| Byte | Bit | Comments           |
|------|-----|--------------------|
| 11   | 7   | 0                  |
|      | 6   | Reserved           |
|      | 5   |                    |
|      | 4   |                    |
|      | 3   |                    |
|      | 2   | Reserved           |
|      | 1   |                    |
|      | 0   |                    |
| 12   | 7   | 0                  |
|      | 6   | Reserved           |
|      | 5   |                    |
|      | 4   |                    |
|      | 3   |                    |
|      | 2   | Reserved           |
|      | 1   |                    |
|      | 0   |                    |
| 13   | 7   | 0                  |
|      | 6   | Reserved           |
|      | 5   |                    |
|      | 4   |                    |
|      | 3   |                    |
|      | 2   | Reserved           |
|      | 1   |                    |
|      | 0   |                    |
| 14   | 7   | 0                  |
|      | 6   | Reserved           |
|      | 5   |                    |
|      | 4   |                    |
|      | 3   |                    |
|      | 2   | Reserved           |
|      | 1   |                    |
|      | 0   |                    |
| 15   | 7   | 1 Terminator (FFh) |
|      | 6   | 1                  |
|      | 5   | 1                  |
|      | 4   | 1                  |
|      | 3   | 1                  |
|      | 2   | 1                  |
|      | 1   | 1                  |
|      | 0   | 1                  |

## Command Setting Values

### SHUTTER SPEED

| Index | 60/30 mode | 50/25 mode |
|-------|------------|------------|
| 15    | 1/10000    | 1/10000    |
| 14    | 1/6000     | 1/6000     |
| 13    | 1/4000     | 1/3500     |
| 12    | 1/3000     | 1/2500     |
| 11    | 1/2000     | 1/1750     |
| 10    | 1/1500     | 1/1250     |
| 0F    | 1/1000     | 1/1000     |
| 0E    | 1/725      | 1/600      |
| 0D    | 1/500      | 1/425      |
| 0C    | 1/350      | 1/300      |
| 0B    | 1/250      | 1/215      |
| 0A    | 1/180      | 1/150      |
| 09    | 1/125      | 1/120      |
| 08    | 1/100      | 1/100      |
| 07    | 1/90       | 1/75       |
| 06    | 1/60       | 1/50       |
| 05    | 1/30       | 1/25       |
| 04    | 1/15       | 1/12       |
| 03    | 1/8        | 1/6        |
| 02    | 1/4        | 1/3        |
| 01    | 1/2        | 1/2        |
| 00    | 1/1        | 1/1        |

### IRIS

| Index | Iris  |
|-------|-------|
| 11    | F1.6  |
| 10    | F2    |
| 0F    | F2.4  |
| 0E    | F2.8  |
| 0D    | F3.4  |
| 0C    | F3.8  |
| 0B    | F4.2  |
| 0A    | F4.8  |
| 09    | F5.4  |
| 08    | F6    |
| 07    | F6.8  |
| 06    | F8    |
| 05    | F9.6  |
| 04    | F11   |
| 03    | F14   |
| 02    | F16   |
| 01    | F19   |
| 00    | CLOSE |

### GAIN LIMIT & GAIN POSITION

| Index | Gain       |
|-------|------------|
| 0F    | +58dB      |
| 0E    | +52dB      |
| 0D    | +48dB      |
| 0C    | +44dB      |
| 0B    | +40dB      |
| 0A    | +36dB      |
| 09    | +32dB      |
| 08    | +28dB      |
| 07    | +24dB      |
| 06    | +20dB      |
| 05    | +16dB      |
| 04    | +12dB      |
| 03    | +8dB       |
| 02    | +4dB       |
| 01    | +0dB (OFF) |
| 00    | -3dB       |

### EXPOSURE COMPENSTAION(bright)

| Index | Iris | Gain     |
|-------|------|----------|
| 0E    | +7   | +10.5 dB |
| 0D    | +6   | +9 dB    |
| 0C    | +5   | +7.5 dB  |
| 0B    | +4   | +6 dB    |
| 0A    | +3   | +4.5 dB  |
| 09    | +2   | +3 dB    |
| 08    | +1   | +1.5 dB  |
| 07    | 0    | 0 dB     |
| 06    | -1   | -1.5 dB  |
| 05    | -2   | -3 dB    |
| 04    | -3   | -4.5 dB  |
| 03    | -4   | -6 dB    |
| 02    | -5   | -7.5 dB  |
| 01    | -6   | -9 dB    |
| 00    | -7   | -10.5 dB |

### Aperture (=sharpness)

| Index | Level |
|-------|-------|
| 0F    | Sharp |
| ...   |       |
| 00    | Dull  |

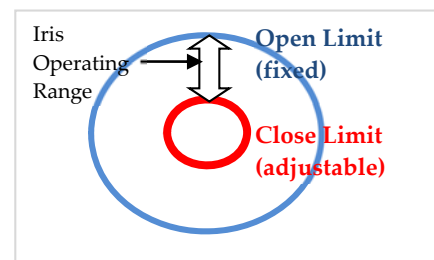
Red/Blue Manual Gain  
0x00 ~ 0xFF

### AE BRIGHT MODE LEVEL

| Index | Iris     | Gain  |
|-------|----------|-------|
| 1F    | F1.6     | +58dB |
| 1E    | F1.6     | +52dB |
| 1D    | F1.6     | +48dB |
| 1C    | F1.6     | +44dB |
| 1B    | F1.6     | +40dB |
| 1A    | F1.6     | +36dB |
| 19    | F1.6     | +32dB |
| 18    | F1.6     | +28dB |
| 17    | F1.6     | +24dB |
| 16    | F1.6     | +20dB |
| 15    | F1.6     | +16dB |
| 14    | F1.6     | +12dB |
| 13    | F1.6     | +8dB  |
| 12    | F1.6     | +4dB  |
| 11    | F1.6     | 0 dB  |
| 10    | F2       | 0 dB  |
| 0F    | F2.4     | 0 dB  |
| 0E    | F2.8     | 0 dB  |
| 0D    | F3.4     | 0 dB  |
| 0C    | F3.8     | 0 dB  |
| 0B    | F4.2     | 0 dB  |
| 0A    | F4.8     | 0 dB  |
| 09    | F5.4     | 0 dB  |
| 08    | F6       | 0 dB  |
| 07    | F6.8     | 0 dB  |
| 06    | F8       | 0 dB  |
| 05~01 | F9.6~F11 | 0 dB  |
| 00    | CLOSE    | 0 dB  |

### IRIS CLOSE LIMIT

| Index | Open Level |
|-------|------------|
| A0    | More Open  |
| ...   |            |
| 60    | default    |
| ...   |            |
| 10    | More Close |



## Lens Control

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zoom Position    | 0000 ~ 4000 ~ 7AC0<br>Wide end Optical Tele end Digital Tele end                                                                                                                                                                                                                                                                                                                                                     |
| Focus Position   | 1000 ~ F000<br>Far end Near end                                                                                                                                                                                                                                                                                                                                                                                      |
| Focus Near Limit | <div> 1000 // inf<br/>1200 //500m<br/>1400 //200m<br/>1600 //100m<br/>1700 //60m<br/>2000 // 30m<br/>2400 //20m<br/>3000 // 10m<br/>5000 // 5m<br/>7000 // 3m<br/>8000 //2.5m<br/>9000 // 2m<br/>A000 // 1.5m<br/>C000 // 1m<br/>D000 // 50cm<br/>F000 // 10cm </div> <div> The Lower 1 byte is fixed to 00<br/><br/>(* ) As the distance on the left will differ due to temperature or any other conditions. </div> |

## Optical Zoom Position

| Zoom Ratio | Optical Zoom Position |
|------------|-----------------------|
| X1         | 0000                  |
| X2         | 16A1                  |
| X3         | 2063                  |
| X4         | 2628                  |
| X5         | 2A1D                  |
| X6         | 2D13                  |
| X7         | 2F6D                  |
| X8         | 3161                  |
| X9         | 330D                  |
| X10        | 3486                  |
| X11        | 35D7                  |
| X12        | 3709                  |
| X13        | 3820                  |
| X14        | 3920                  |
| X15        | 3A0A                  |
| X16        | 3ADD                  |
| X17        | 3B9C                  |
| X18        | 3C46                  |
| X19        | 3CDC                  |
| X20        | 3D60                  |
| X21        | 3DD4                  |
| X22        | 3E39                  |
| X23        | 3E90                  |
| X24        | 3EDC                  |
| X25        | 3F1E                  |
| X26        | 3F57                  |
| X27        | 3F8A                  |
| X28        | 3FA4                  |
| X29        | 3FB8                  |
| X30        | 3FD0                  |
| X31        | 3FE0                  |
| X32        | 3FF0                  |
| X33        | 4000                  |

### Digital Zoom Position

| Digital Zoom Ratio | Combine Mode | Separate Mode |
|--------------------|--------------|---------------|
| X1                 | 4000         | 00            |
| X2                 | 6000         | 80            |
| X3                 | 6A80         | AA            |
| X4                 | 7000         | C0            |
| X5                 | 7300         | CC            |
| X6                 | 7540         | D5            |
| X7                 | 76C0         | DB            |
| X8                 | 7800         | E0            |
| X9                 | 78C0         | E3            |
| X10                | 7980         | E6            |
| X11                | 7A00         | E8            |
| X12                | 7AC0         | EB            |

### Tele/Wide Limit Setting

| Value | Wide Limit |       | Tele Limit |       |
|-------|------------|-------|------------|-------|
|       | Zoom       | Ratio | Zoom       | Ratio |
| 00    | 0000       | 1     | 4000       | 30    |
| 10    | 00C4       | 1.02  | 3F3B       | 25.5  |
| 20    | 0188       | 1.04  | 3E77       | 22.7  |
| 30    | 024C       | 1.06  | 3DB3       | 20.7  |
| 40    | 0310       | 1.08  | 3CEF       | 19.1  |
| 50    | 03D4       | 1.11  | 3C2B       | 17.8  |
| 60    | 0498       | 1.13  | 3B67       | 16.7  |
| 70    | 055C       | 1.15  | 3AA3       | 15.7  |
| 80    | 0620       | 1.18  | 39DF       | 14.8  |
| 90    | 06E4       | 1.2   | 391B       | 14    |
| A0    | 07A8       | 1.23  | 3857       | 13.2  |
| B0    | 086C       | 1.26  | 3793       | 12.5  |
| C0    | 0930       | 1.28  | 36CF       | 11.8  |
| D0    | 09F4       | 1.31  | 360B       | 11.2  |
| E0    | 0AB8       | 1.34  | 3547       | 10.6  |
| F0    | 0B7C       | 1.38  | 3483       | 10    |
| FF    | 0C33       | 1.41  | 33CC       | 9.5   |

### GAMMA POSITION

| Index | Gamma |
|-------|-------|
| 0     | 0.45  |
| 1     | 0.50  |
| 2     | 0.55  |
| 3     | 0.60  |
| 4     | 0.65  |
| 5     | 0.70  |
| 6     | 0.75  |

## Title Setting

|             |                    |        |
|-------------|--------------------|--------|
| Line number | 00 to 14h          |        |
| H-position  | 00 to 28h          |        |
| Blink       | 00: Dose not blink |        |
|             | 01: Blinks         |        |
| Color       | 00                 | White  |
|             | 01                 | Yellow |
|             | 02                 | Violet |
|             | 03                 | Red    |
|             | 04~06              | White  |

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| A  | B  | C  | D  | E  | F  | G  | H  |
| 08 | 09 | 0a | 0b | 0c | 0d | 0e | 0f |
| I  | J  | K  | L  | M  | N  | O  | P  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Q  | R  | S  | T  | U  | V  | W  | X  |
| 18 | 19 | 1a | 1b | 1c | 1d | 1e | 1f |
| Y  | Z  | &  |    | ?  | !  | 1  | 2  |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  | 0  |
| 28 | 29 | 2a | 2b | 2c | 2d | 2e | 2f |
| À  | È  | Ì  | Ò  | Û  | Á  | É  | Í  |
| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
| Ó  | Ú  | Â  | Ê  | Ô  | Æ  |    | Å  |
| 38 | 39 | 3a | 3b | 3c | 3d | 3e | 3f |
| Ö  | Ñ  | Ç  | ß  | Ä  | Ï  | Ö  | Ü  |
| 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
| À  | \$ |    | ¥  |    | £  | ı  | ı  |
| 48 | 49 | 4a | 4b | 4c | 4d | 4e | 4f |
| ø  | “  | :  | ‘  | .  | ,  | /  | -  |
| 50 |    |    |    |    |    |    |    |
| →  |    |    |    |    |    |    |    |

## Custom/Memory Preset Setting Items

| Item                  | Custom Preset | Memory Preset |
|-----------------------|---------------|---------------|
| Zoom Position         | O             | O             |
| Digital Zoom On/Off   | O             | O             |
| Digital Zoom Position | O             | X             |
| Zoom Start Position   | O             | X             |
| Zoom Stop Position    | O             | X             |
| Zoom Speed            | O             | X             |
| AF Home Position      | O             | X             |
| AF Limited Range      | O             | X             |
| Focus Position        | O             | O             |
| Focus Mode            | O             | O             |
| Near Limit Setting    | O             | X             |
| AF Sensitivity        | O             | X             |
| AF Mode               | O             | O             |
| AF Run Time           | O             | X             |
| AF Interval Time      | O             | X             |
| WB Mode               | O             | O             |

|                                  |   |   |
|----------------------------------|---|---|
| WB Data(Rgain,Bgain)             | O | O |
| COLOR Gain                       | O | X |
| AE Mode                          | O | O |
| AE Response                      | O | X |
| AE Slow Shutter                  | O | O |
| Shutter Position                 | O | O |
| Iris Position                    | O | O |
| Gain Position                    | O | O |
| Gain Limit                       | O | O |
| Bright Position                  | O | O |
| Exposure Compensation Mode       | O | O |
| Exposure Compensation Amount     | O | O |
| Flickerless                      | O | X |
| Aperture Level                   | O | O |
| Gamma                            | O | X |
| High Resolution                  | O | X |
| LR Reverse                       | O | X |
| Picture Flip                     | O | X |
| Freeze                           | O | X |
| Picture Effect                   | O | X |
| D-WDR                            | O | X |
| Defog                            | O | O |
| Defog Level                      | O | X |
| 3DNR Mode                        | O | O |
| 3DNR Level                       | O | X |
| 2DNR Mode                        | O | X |
| 2DNR Weight                      | O | X |
| Digital Image Stabilizer On/Off  | O | X |
| Digital Image Stabilizer Setting | O | X |
| BackLight On/Off                 | O | O |
| BLC Setting                      | O | X |
| WDR On/Off                       | O | O |
| HLC On/off                       | O | X |
| HLC Setting                      | O | X |
| ICR On/Off                       | O | O |
| Auto ICR On/Off                  | O | O |
| Auto ICR Threshlod Level         | O | X |
| Day&Night Dwell Time             | O | X |
| Day->Night AGC level             | O | X |
| Night->Day AGC level             | O | X |
| Day->Night EXT-H level           | O | X |
| Night -> Day EXT-H level         | O | X |
| Day->Night EXT-L level           | O | X |
| Night -> Day EXT-L level         | O | X |
| Privacy Mask On/Off              | O | X |
| Privacy Mask Display             | O | X |
| Privacy Mask Setting             | O | X |
| Motion On/Off                    | O | X |
| Motion Display                   | O | X |
| Motion Setting                   | O | X |
| Title Display On/Off             | O | X |
| Title Setting                    | O | X |
| Display On/Off                   | O | X |
| ETC                              | X | X |

## Register Setting

|                   |                            |                                                          |
|-------------------|----------------------------|----------------------------------------------------------|
| CAM_RegisterValue | 8x 01 04 24<br>mm 0p 0p FF | mm: Register No. (=00-7F)<br>pp: Register Value (=00-7F) |
|-------------------|----------------------------|----------------------------------------------------------|

| command                 | Register (mm) | Value (pp)            | contents                                                             |
|-------------------------|---------------|-----------------------|----------------------------------------------------------------------|
| VISCA Baud Rate         | 00            | 00<br>(Default)       | 9600 bps                                                             |
|                         |               | 01                    | 19200 bps                                                            |
|                         |               | 02                    | 38400 bps                                                            |
|                         |               | 03                    | 115200bps                                                            |
|                         |               | 04                    | 57600 bps                                                            |
|                         |               | 05                    | 2400 bps                                                             |
|                         |               | 06                    | 4800 bps                                                             |
| Monitoring Mode         | 72            | 01                    | 1080i/60                                                             |
|                         |               | 02                    | 1080i/60                                                             |
|                         |               | 04                    | 1080i/50                                                             |
|                         |               | 06                    | 1080p/30                                                             |
|                         |               | 07                    | 1080p/30                                                             |
|                         |               | 08                    | 1080p/25                                                             |
|                         |               | 09                    | 720p/60                                                              |
|                         |               | 0A                    | 720p/60                                                              |
|                         |               | 0C                    | 720p/50                                                              |
|                         |               | 0E                    | 720p/30                                                              |
|                         |               | 0F                    | 720p/30                                                              |
|                         |               | 11                    | 720p/25                                                              |
|                         |               | 13                    | 1080p/60                                                             |
|                         |               | 14                    | 1080p/50                                                             |
|                         |               | 15                    | 1080p/60                                                             |
| LVDS mode               | 74            | 00<br>(Default)       | Single output                                                        |
|                         |               | 01                    | Dual output                                                          |
| Zoom Limit              | 50            | 00~FF<br>(default:00) | Wide Limit                                                           |
|                         | 51            | 00~FF<br>(default:00) | Tele Limit                                                           |
| E-Zoom Max              | 52            | 00-FF<br>(Default:EB) | Max. digital zoom ratio =<br>256 ÷ (256-Value)                       |
| FocusOffset @DomeCover  | 55            | 00-FF<br>(Default:00) | 00: None<br>FF: Max.                                                 |
| Auto Slow shutter limit | 56            | 01<br>(default)       | 1/30                                                                 |
|                         |               | 02                    | 1/15                                                                 |
|                         |               | 03                    | 1/8                                                                  |
|                         |               | 04                    | 1/4                                                                  |
|                         |               | 05                    | 1/2                                                                  |
|                         |               | 06                    | 1/1                                                                  |
| Enlargement Mode        | 5F            | 00~FF<br>(default:00) | Bit3:Auto ICR<br>OFF→ON<br>setting enable<br>ON/OFF<br>(1:ON, 0:OFF) |

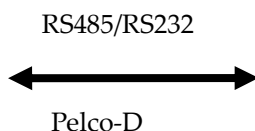
|                          |    |          |                                                                                                               |
|--------------------------|----|----------|---------------------------------------------------------------------------------------------------------------|
| Language                 | 60 | 00~06    | 00:English<br>01:Russian<br>02:Spanish<br>03:Chinese<br>04:German<br>05:Franch<br>06:Portuguese<br>07:Japanes |
| CVBS scale               | 7C | 00<br>01 | 4:3<br>16:9                                                                                                   |
| EX-SDI V1.0              | 7E | 00<br>01 | OFF<br>ON                                                                                                     |
| DVR-Select (=color type) | 4D | 00~XX    | pp : DVR<br>See. DVR select                                                                                   |

\* DVR Select \*

| HZ7833M-LA (AHD) |          | HZ7833M-LT (TVI) |             |
|------------------|----------|------------------|-------------|
| pp               | DVR TYPE | pp               | DVR TYPE    |
| 00               | STANDARD | 00               | STANDARD    |
| 01               | CVBS     | 01               | CVBS        |
| 02               | USER     | 02               | USER        |
| 03               | FOCUS    | 03               | HIKVISION-B |
| 04               | RAYSHARP | 04               | HIKVISION-A |
| 05               | TAGATEC  | 05               | WEBGATE     |
| 06               | TECHWIN  | 06               | RAYSHARP    |
| 07               | 3R       |                  |             |
| 08               | CHN      |                  |             |



| Command                   | Output : PELCO-D     | Description                                                                     |
|---------------------------|----------------------|---------------------------------------------------------------------------------|
| Zoom +                    | FF 01 00 20 00 00 CS |                                                                                 |
| Zoom -                    | FF 01 00 40 00 00 CS |                                                                                 |
| Focus +                   | FF 01 01 00 00 00 CS |                                                                                 |
| Focus -                   | FF 01 00 80 00 00 CS |                                                                                 |
| Iris +                    | FF 01 02 00 00 00 CS | It is used for Menu                                                             |
| Iris -                    | FF 01 04 00 00 00 CS |                                                                                 |
| Stop                      | FF 01 00 00 00 00 CS |                                                                                 |
|                           |                      |                                                                                 |
| Go To Preset              | FF 01 00 07 00 zz CS | zz : preset no (00~FF)                                                          |
| Set Preset                | FF 01 00 03 00 zz CS | total 256 zoom/focus position presets.                                          |
| Clear Preset              | FF 01 00 05 00 zz CS | Reserved presets : zz = 21, 5F, 60,62                                           |
|                           |                      |                                                                                 |
| Flip(180 rotate)          | FF 01 00 07 00 21 CS |                                                                                 |
| Menu or SET               | FF 01 00 07 00 5F CS | Menu command(Go to preset + 95)                                                 |
| Menu or SET               | FF 01 00 07 00 60 CS | Menu command(Go to preset + 96)                                                 |
| Menu or SET               | FF 01 00 03 00 62 CS | Menu command(Set preset + 98)                                                   |
|                           |                      |                                                                                 |
| Zoom speed                | FF 01 00 25 00 zz CS | zz = 00(slow)~03 (fast), default:02                                             |
| Reset camera to default   | FF 01 00 29 00 00 CS | Initialize camera settings                                                      |
| Auto focus auto/on/off    | FF 01 00 2B 00 zz CS | zz = 00(auto),01(one push AF),02(one push mode), 03(manual), 04(one shot-limit) |
| Backlight on/off          | FF 01 00 31 00 zz CS | zz = 01(on),02(off)                                                             |
| Auto white balance on/off | FF 01 00 33 00 zz CS | zz = 01(Auto WB mode),02(manual WB mode)                                        |
| Set Shutter speed         | FF 01 00 37 zz zz CS | zzzz : shutter speed (see. Shutter speed table)                                 |



## **Supported DVRs**

Since the color representation differs depending on the DVR, you have to select the type of DVR to use.

| Video Output     | HD-AHD       | HD-TVI           | HD-SDI      | EX-SDI(V1.0) |
|------------------|--------------|------------------|-------------|--------------|
| Standard Device  | STANDARD (*) | STANDARD(*)      | STANDARD(*) | STANDARD(*)  |
|                  | CVBS(*)      | CVBS(*)          | CVBS(*)     | CVBS(*)      |
| DVR manufacturer | RAYSHARP     | HIK VISION (A/B) |             |              |
|                  | TECHWIN      | WEBGATE          |             |              |
|                  | FOCUS        | RAYSHARP         |             |              |
|                  | 3R           |                  |             |              |
|                  | TAGATEC      |                  |             |              |

(\*) STANDRAD : Standard Color

(\*) CVBS : If you connect directly to a CVBS monitor, select "CVBS".

(\*)Alternatively, you can change the color directly in the menu.