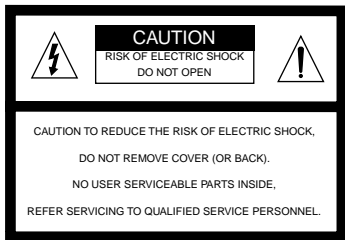


Operating Instructions

ZC-NAF27



Before installing and using the camera, please read these instructions thoroughly and retain them for later reference.



This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Warning

To prevent fire or shock hazard, do not expose the unit to rain or moisture. To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

Regulatory Notices For U.S.A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- A suitable conduit entries, knock-outs or glands shall be provided in the cable entries of this product in the end user.
- Caution: Danger of explosion if battery is incorrectly replaced. Replaced only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- Holes in metal, through which insulated wires pass, shall have smooth well rounded surfaces or shall be provided with brushings.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Contents

Features	3
Cautions for Safe Operation	4
Operating Controls and Their Functions	5
Connections	6
Control	7
MENU DESCRIPTIONS	8
CAMERA ID	9
FOCUS MODE SET	10-11
AWB SET	12-13
AE SET	14-16
SPECIAL SET	17-18
MOTION DET	19
F. OSD SET	20
E. SENSITIVITY	21
WDR SET	22
On-Screen Display	23-24
Specifications	25-26
RS-422/RS-485 Command	27-66

FEATURES

- The power zoom color video camera is designed for use in monitoring system.
- High resolution and high sensitivity with a 1/4 inch CCD (Charge Coupled Device)
- High magnitude of zoom lens with optical X 27, Digital X 270(MAX)
- Auto Focus
- Auto White balance
- Auto exposure with DC Iris control
- Day & Night function
- DSS(Digital Slow Shutter) is available.
- WDR(Wide Dynamic Range) is available.

Cautions for Safe Operation

Power Supply

This camera must always be operated a 12V DC power supply. (More than 500mA)

Handling of the unit

Be careful not to spill water or other liquids on the unit, or to get combustible or metallic material inside the body. If used with foreign matter inside, the camera is liable to fail, or to be a cause of fire or electric shock.

Operating and storage location

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

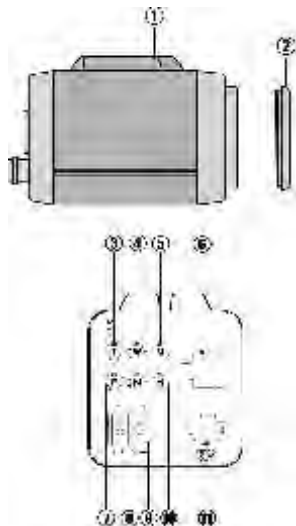
- Extremely hot or cold places (operating temperature 0°C-45°C)
- Damp or dust place
- Where it is exposed to rain
- Where it is subject to strong vibration

- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters.

Care of the unit

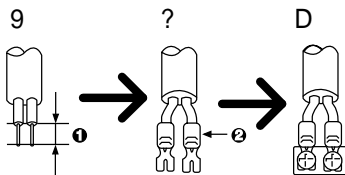
- Remove dust or dirt on the surface of the lens with a blower.
- Use a dry soft cloth to clean the body. If it is very dirty, use a cloth dampened with a small quantity of neutral detergent, then wipe dry.
- Avoid the use of volatile solvents such as thinners, alcohol, benzene, and insecticides. They may damage the surface finish and/or impair the operation of the camera.

Operating Controls and Their Functions



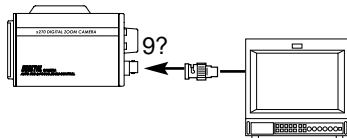
- 1. Tripod adaptor**
This adaptor can also be attached on the bottom of the camera.
- 2. Lens mount cap**
- 3. TELE Key**
When push the TELE KEY, picture is telephoto
- 4. WIDE Key**
When push the WIDE KEY, picture is wide angle
- 5. Menu Key**
If you want to set up a diverse function, you can push this button.
- 6. Control JACK (RJ45)**
Connect RS-422 interface
- 7. Focus Far Key**
In a manual situation, focus get far.
- 8. Focus Near Key**
In a manual situation, focus get near.
- 9. DC 12V screw terminal**
Connect to an external power supply of DC 12V.
- 10. Hot Key**
Use to get digital Shutter speed mode.
- 11. Video output(BNC type)**
Connect to the video in connector of a monitor.

Connections



Power Connection

1. Remove the insulation on the power cable as illustrated.
2. Attach the terminal tips.
3. Connect to the DC 12V terminals on the camera.

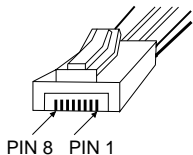
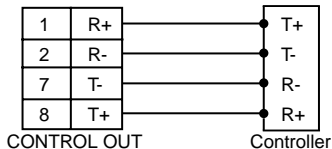


Connection the monitor

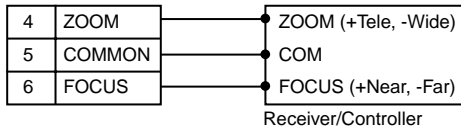
1. To VIDEO OUT
2. To Video input on the monitor

Control

Remote Control Lines are connected to RJ-45 socket as shown below
In case of RS-422 INTERFACE (Basic)



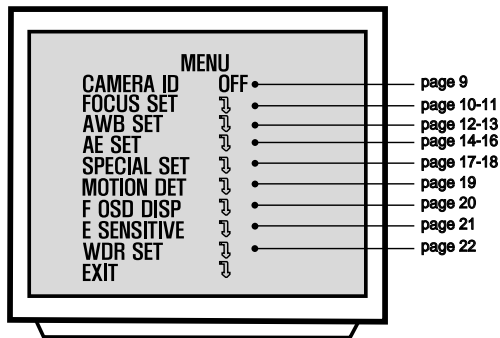
In case of Zoom/Focus control Interface (option)



Voltage Range

+	Vcom + (+5~15V)
-	Vcom - (+5~15V)

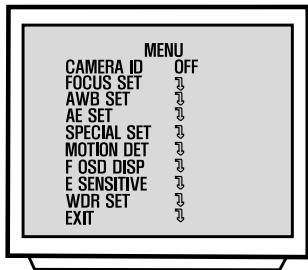
MENU DESCRIPTIONS



Using TELE, WIDE, FOCUS+, FOCUS- button

- TELE and WIDE are used for UP and DOWN.
- FOCUS+ and FOCUS- are used for INCREASE and DECREASE the data.

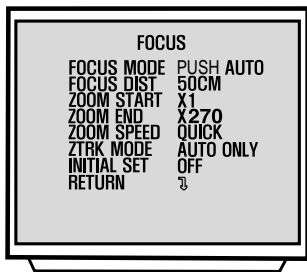
CAMERA ID



1. CAMERA ID

To connect a large number of camera , It can be assigned to identification number to each camera for camera control easily. (OFF, 0 - 255 : total numbers of ID are 256)

- It only can be set this function using ID commend. To transfer ID Code of camera , In first byte at PC control. Set the ID number of camera , and then the ID number display continuously.



2. Focus Set:

2-1. Focus Mode Set:

This function is for focus mode setting

- A) Set up "FOCUS SET" in main menu using Menu key.
Select the "FOCUS MODE" in submenu using Tele/Wide key. And then set the mode (Auto, Push auto, or Manual) using Focus key.

2-2. Focus Distance Set:

This function is for selection of minimum shooting distance.

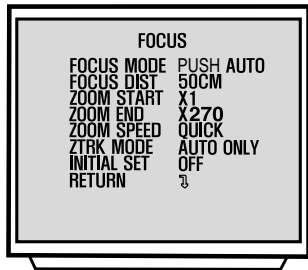
- A) Select the "FOCUS DIST" in submenu using Tele/wide key.
B) Set the focus distance mode from 1cm to 5M. (1cm, 10cm, 50cm, 1M, 3M, 5M) using Focus key.

2-3. ZOOM START Set :

This function is for selection of zoom start position.

- A) Select the "ZOOM START" in submenu using Tele/wide key.
B) Set the Zoom start mode from x1 to x27. using Focus key.

FOCUS MODE SET



2-4. ZOOM END Set:

This function is for selection of zoom end position.

- A) Select the "ZOOM END" in submenu using Tele/wide key.
- B) Set the Zoom end mode from (Zoom Start + 1) x 270 to X using Focus key.

2-5. ZOOM SPEED Set:

This function is for selection of zoom speed.

- A) Select the "ZOOM SPEED" in submenu using Tele/wide key.
- B) Set the Zoom speed, Slow, Middle, Quick using Focus key.

2-6. ZOOM TRACKING MODE Set:

This function is for selection of zoom tracking mode.

- A) Select the "ZTRK" in submenu using Tele/wide Command, B) Set the Zoom tracking mode to Auto or Manual.

* Zoom tracking means focused zooming state.

2-7. INITIAL SET:

If initial mode set to ON, All FOCUS SET function is changed to the factory setting.

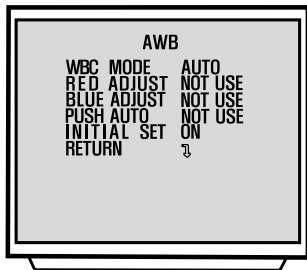
- A) Select the "INITIAL SET" in submenu using Tele/wide key. B) Set the initial set mode to ON or OFF using Focus key.

2-8. RETURN TO MAIN MENU:

This function is exit to main menu.

- A) Select the "RETURN" in submenu using Tele/wide key. B) Set the return mode using Focus key.

AWB SET



3. AWB SET

3-1. WB Mode Set:

This function is for changing the WB mode.

- A) Set up "AWB SET" in main menu using Tele/wide key.
- B) Select the "WB MODE" in submenu using Tele/wide key.
- C) Set the mode Auto, Push auto , Manual, Outdoor, Indoor, Special using Focus key.

***WBC MODE ; Use for changing White Balance Mode .**

- 1) AUTO ; WB Range 2800 °K ~ 8000 °K.
- 2) PUSH AUTO ; Set the AWB mode to Push Auto, then WB Mode is auto.
- 3) SPECIAL ; Under the special WB condition(Differ from curve of the control color temperature), Adjust Red and Blue to perform a desired Auto White Balance.

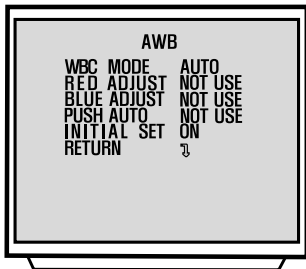
3-2. RED ADJUST Set:

This function is available for Special ,Push Auto, Manual WB mode.

This mode is the adjustment of user option for special color.

- A) Select the "RED ADJUST" in submenu using Tele/wide key.
- B) Adjust the level from (-30 to 30 SPECIAL, -128 to +127 PUSH AUTO, 0-255 MANUAL) using Focus key.

AWB SET



3-3. BLUE ADJUST Set :

This function is available for Special ,Push Auto, Manual WB mode.

This mode is the adjustment of user option for special color.

- Select the "BLUE ADJUST" in submenu using Tele/wide key.
- Adjust the level from (-30 to 30 SPECIAL, -128 to +127 PUSH AUTO, 0-255 MANUAL) using Focus key.

3-4. PUSH AUTO :

In case of PUSH AUTO WB mode.

Adjust the push auto mode ON, WB act automatically.

3-5. INITIAL SET :

If initial mode set to ON, All AWB function is changed to the factory setting

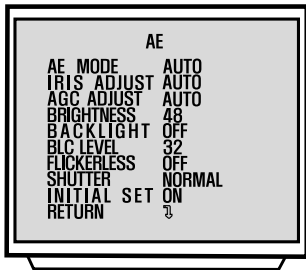
- Select the "INITIAL SET" in submenu using Tele/wide key.
- Set the initial set mode to ON or OFF using Focus key.

3-6. RETURN TO MAIN MENU :

This function is exit to main menu.

- Select the "RETURN " in submenu. Using Tele/wide key.
- Set the return mode using Focus key.

AE SET



4. AE SET

4-1. AE Mode Set:

This function is for changing to AE mode.

- A) Set up "AE SET" in main menu using Tele/wide key.
- B) Select the "AE MODE" in submenu using Tele/wide key.
- C) Set the mode auto, IRIS MAN, AGC MAN, Manual, Auto using Focus key.

4-2. IRIS ADJUST Set:

This function is available for IRIS MAN mode.

- A) Select the "IRIS ADJUST" in submenu using Tele/wide key. B) Adjust the level from ##MIN to ##MAX(MANUAL, IRIS MAN) using Focus key.

* ## : Current level at Auto mode.

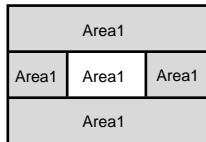
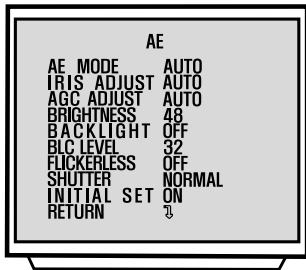
4-3. AGC ADJUST Set :

This function is available for AGC MAN mode.

- A) Select the "IRIS ADJUST" in submenu using Tele/wide key. B) Adjust the level from ##MIN to ##MAX(MANUAL, AGC MAN) using Focus key.

* ## : Current level at Auto mode.

AE SET



Auto BLC

4-4. BRIGHTNESS ADJUSTMENT Set:

- A) Select the "BRIGHTNESS" in submenu using Tele/wide key. B) Adjust the level from ##MIN to ##MAX. using Focus key.

* ## : Current level at Auto mode.

4-5. BACKLIGHT Set:

- A) Select the "BACKLIGHT" in submenu using Tele/wide key.
B) Set the mode OFF, ON, or AUTO using Focus key.

* Auto BLC (Auto back light compensation)

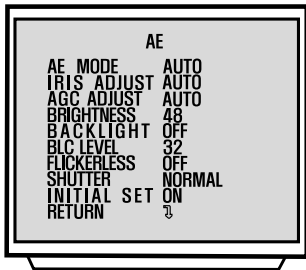
When a back light condition occurs in area1, area2, area3, or area4. the back light compensation is enable. When the back light condition disappears in that area, BLC is disable automatically. If do not want this mode, set to OFF

4-6. FLICKERLESS Set:

- A) Select the "FLICKERLESS" in submenu using Tele/wide key.
B) Set the mode OFF, ON using Focus key.

* FLICKERLESS ; Use for removing the flicker of picture
ON : Remove the flicker (In case of PAL System ;
Shutter Speed 1/120 sec).

AE SET



4-7. SHUTTER SPEED Set:

- A) Select the "SHUTTER" in submenu using Tele/wide key.
- B) Set the mode NORMAL, 1/125 - 1/10000 using Focus key.

4-8. INITIAL SET:

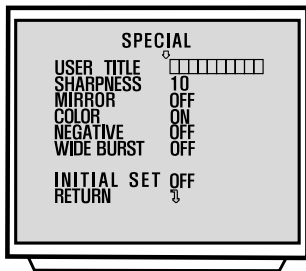
- A) Select the "INITIAL SET" in submenu using Tele/wide Command,
- B) Set the initial set mode to ON or OFF using Focus key.

4-9. RETURN TO MAIN MENU:

This function is exit to main menu.

- A) Select the "RETURN " in submenu using Tele/wide key.
- B) Set the return mode using Focus key.

SPECIAL SET



5. SPECIAL SET

5-1. User Title Set:

This function is for custom title on screen display.

- A) Set "SPECIAL SET" in main menu using Tele/wide key.
- B) Select the "USER TITLE" in submenu using Tele/wide key.
- C) Set the position of title and set data using Tele / Wide, Focus key.

5-2. SHARPNESS ADJUST Set:

- A) Select the "SHARPNESS" in submenu using Tele/wide key.
- B) Adjust the level from 0 to 15 using Focus key.

5-3. MIRROR Set:

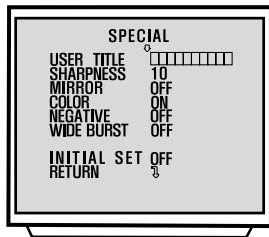
- A) Select the "MIRROR" in submenu using Tele/wide key.
- B) Select the mode ON, OFF using Focus key.

5-4. COLOR Set:

This mode is for B/W mode.

- A) Select the "COLOR" in submenu using Tele/wide key. B) Select the mode ON, OFF using Focus key.

SPECIAL SET



5-5. NEGATIVE Set:

This mode is to change color and luminance to negative.

- A) Select the "COLOR" in submenu using Tele/wide key.
- B) Select the mode ON, OFF using Focus key.

5-6. WIDE BURST Set:

This mode is to change color burst width for long distance application.

- A) Select the "WIDEBURST" in submenu using Tele/wide key.
- B) Select the mode ON, OFF using Focus key.

5-7. LANGUAGE SET:

- A) ENG / CHI : English / Chinese language select
- B) BLANK : English Only

5-8. INITIAL SET: If initial mode set to ON, All SPECIAL functions are changed to the factory setting

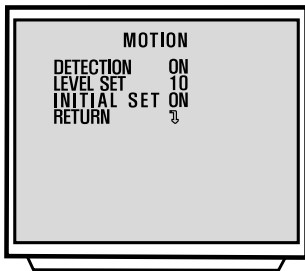
- A) Select the "INITIAL SET" in submenu using Tele/wide key.
- B) Set the initial set mode to ON or OFF Using Focus key.

5-9. RETURN TO MAIN MENU:

This function is exit to main menu.

- A) Select the "RETURN" in submenu using Tele/wide key.
- B) Set the return mode Using Focus key.

MOTION DET



6. MOTION DETECTION SET

6-1. DETECTION Mode Set:

- A) Set "MOTION" in main menu using Tele/wide key.
- B) Select the "DETECTION" in submenu. Using Tele/wide key.
- C) Set the mode ON, OFF using Focus key.

6-2. LEVEL ADJUST Set:

This function is available for DETECTION ON mode.

- A) Select the "LEVEL SET" in submenu. Using Tele/wide key.
- B) Adjust the level to some sensitivity using Focus key.

6-3. INITIAL SET:

If initial mode set to ON, All MOTION functions are changed to the factory setting

- A) Select the "INITIAL SET" in submenu using Tele/wide key.
- B) Set the initial set mode to ON or OFF Using Focus key.

6-4. RETURN TO MAIN MENU:

This function is exit to main menu.

- A) Select the "RETURN" in submenu using Tele/wide key.
- B) Set the return mode Using Focus key.

F. OSD SET



7-1. FUNCTION Set:

- A) Set "F. OSD" in main menu using Tele/wide key.
- B) Select the mode what you want in submenu using Tele/wide key.
- C) Set the display mode of OSD using Tele / Wide, Near/Far key.

***INITIAL SET and RETURN are the same as before procedure.**

E. SENSITIVITY SET



8. E. SENSITIVITY SET

8-1. E. SENSITIVITY SET

- Select the "E.SENSITIVITY" in submenu using Tele/wide key.
- Select the sensitivity mode what you want in submenu using Focus key.

***Mode sequence: OFF-X2 AUTO-X4 AUTO-X8 AUTO-X10
AUTO-X16 AUTO- X32 AUTO -OFF- X2 FIX-X4 FIX -X8
FIX -X10 FIX -X16 FIX - X32 FIX-OFF**

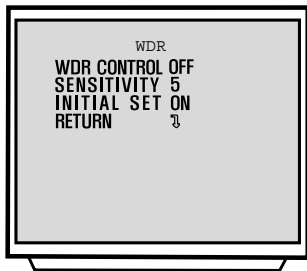
8-2. INITIAL SET: If initial mode set to ON, E.SENSITIVITY functions are changed to the factory setting

- Select the "INITIAL SET" in submenu using Tele/wide key.
- Set the initial set mode to ON or OFF Using Focus key.

8-3. RETURN TO MAIN MENU : This function is exit to main menu.

- Select the "RETURN" in submenu using Tele/wide key.
- Set the return mode Using Focus key.

WDR SET



9. WDR SET

9-1. WDR SET

- Select the "WDR" in main menu using Tele/wide key.
- Select the "WDR CONTROL" in submenu using Tele/wide key.
- Select the WDR mode what you want in submenu using Focus key.

* **Mode sequence : OFF -- ON -- AUTO**

* **WDR Auto mode is working at the condition of high lightback light.**

9-2. LEVEL ADJUST Set:

This function is the gain adjustment of WDR

- Select the "SENSITIVITY" in submenu using Tele/wide key.
- Adjust the level to some sensitivity using Focus key.

9-3. INITIAL SET:

If initial mode set to ON, All WDR functions are changed to the factory setting

- Select the "INITIAL SET" in submenu using Tele/wide key.
- Set the initial set mode to ON or OFF Using Focus key.

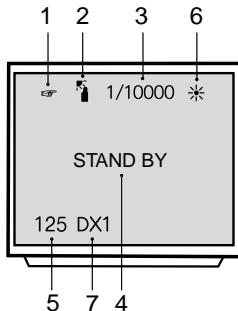
9-4. RETURN TO MAIN MENU:

This function is exit to main menu.

- Select the "RETURN" in submenu using Tele/wide key.
- Set the return mode Using Focus key.



On Screen Display

Some of these functions will be displayed every time the camera is operated and then disappeared after 5 seconds.



FUNCTION	OSD Format	Description
1. Focus Mode	Non display	Auto Mode
		Manual / push Auto Mode
2. Back Light	Non display	Back Light OFF
	"BL" display	BLC ON / Auto BLC Mode
3. Shutter Speed	Non display	Normal Shutter (PAL: 1/50)
	"Ff" display	Flickerless Mode
	1/125 ⋮ 1/10,000	28 variable steps.
4. STAND-BY	Indicate the camera stand-by during the camera's power turning ON.	
5. CAMERA ID	According to write the identification number to each camera, Multi-point control is available (PC Control 000~255).	

On Screen Display

FUNCTION	OSD Format	Description
6. WBC Mode		White Balance AUTO
	S _W	Special Auto White Balance; Adjustment Mode according to change of external illuminant. RED ADJUST and BLUE ADJUST (0~255) are available. After changing R/B value, The maintenance mode is "AUTO".
		WB Preset for INDOOR (3200°K)
		Wb Preset for OUTDOOR (5100°K)
	M _W	Manual WB Adjustment; In manual mode the HUE control is available (0 ~ 99).
	P _W	Push Auto White Balance; Turn this mode ON, the white trace automatically. Turn this mode OFF, preserve the white of final auto tracing action (Manual).
7. ZOOM Display	DX 270	Digital Zoom mode
	X 27	Optical Zoom mode

Specifications

Image device	<u>Image device 1/4" interline transfer CCD</u> <u>NTSC, High resolution : 811(H) X 508(V) 410K</u> <u>NTSC, Normal resolution : 537(H) X 505(V) 270K</u> <u>PAL, High resolution : 795 (H) X 596 (V) 470K</u> <u>PAL, Normal resolution : 537(H) X 597(V) 320K</u>
Sync system	<u>Internal</u>
Horizontal resolution	<u>Approx.480 Line (NTSC, High resolution)</u> <u>320 Line (NTSC, Normal resolution)</u> <u>470 Line (PAL, High resolution)</u> <u>320 Line (PAL, Normal resolution)</u> <u>(at center of screen)</u>
Lens	<u>X 27 Zoom (F 1.5 (W), F 3.8 (T) f= 3.25 ~ 88.0 mm)</u>
Digital Zoom Ratio	<u>X 10 (Total Zoom Ratio X 270)</u>
Minimum illumination	<u>Normal Mode : 1 Lux (1/3 Video Output)</u> <u>Electronic Shutter Speed Mode :</u> <u>0.01 Lux (X32 Field Accumulate)</u> <u>Night Mode : 0 Lux (Infrared ON)</u>
S/N	<u>More than 48dB</u>
Scanning System	<u>2:1 Interlace</u>
Scanning Frequency(H)	<u>15.734 kHz (NTSC), 15.625 kHz (PAL)</u>
Scanning Frequency(V)	<u>59.94Hz (NTSC), 50Hz (PAL)</u>

Specifications

OSD(On Screen Display)	English
Power requirement	DC 9V-15V
Video output	Composite Output 75Ω Terminated
Power consumption	5.3W
operating temperature	0°C - 45°C
Operating Humidity	0% RH - 60% RH
Storage temperature	-20°C - 60°C, 0% RH - 85% RH
Dimensions	57mm(W) X 68.9mm(H) X 111.5mm(D)
Weight	500g

Specifications are subject to change without notice.

RS-422/RS-485 Command

1. Communication Format

1. Connection Conditions>

Data Length	1 Byte (8 Bit)
Start/Stop Bit	1 BIT
Parity Bit	None
Baud rate	9,600 bps

2. The communication data format from PC to Camera

The data of total 6 bytes is transmitted PC to camera.

1) Format:

BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6
0xC5	CODE1	CODE2	CODE3	CAM_ID	C.S

- 2) Description:
- a) BYTE 1 : Camera is realized the protocol comes from PC.
 - b) BYTE 2 : The changed data accounting to PC Command. (Refer to 10-2. PC Command)
 - c) BYTE 3 : The changed data accounting to PC Command.(Refer to 10-2. PC Command)
 - d) BYTE 4 : The changed data accounting to PC Command.(Refer to 10-2. PC Command)
 - e) BYTE 5 : Camera's ID(identification) number to Communicate (0~255).
In case of difference between this value of CAM_ID and given value of Camera's ID, It is impossible to communicate wide.
 - f) BYTE 6 : The value of Check Sum from 'BYTE 1' to 'BYTE 5'.
 $0xC5 + 0x5F + 0x02 + 0x00 + 0x0A = 0x0130$
therefore, **C S = 0x30**

3. The communication data format from Camera to PC

The data of total 6 bytes is transmitted camera to pc.

1) Format

BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6	BYTE 7	BYTE 8	BYTE 9
0xC5	CODE1	CODE2	CODE3	DATA1	DATA2	DATA3	DATA4	C S

- 2) Description:
- a) BYTE 1 : Camera is realized the protocol comes from PC.
 - b) BYTE 2 : BYTE 1 data is received from PC.
 - c) BYTE 3 : BYTE 2 data is received from PC.
 - d) BYTE 4 : BYTE 3 data is received from PC.
 - e) BYTE 5 : The changed data according to PC Command.(Refer to 10-2. PC Command)
 - f) BYTE 6 : The changed data according to PC Command.(Refer to 10-2. PC Command)
 - g) BYTE 7 : The changed data according to PC Command.(Refer to 10-2. PC Command)
 - h) BYTE 8 : The changed data according to PC Command.(Refer to 10-2. PC Command)
 - i) BYTE 9 : The value of Check Sum from 'BYTE 1' to 'BYTE 8'.
The computing method is the same of "BYTE6 of the communication from PC to Camera"

2. PC Command

1. Read Camera ID

This command is to read the ID number on camera that is currently connected.

Caution ↑ This command is valid only one camera is connected.

Control Command

[C5h] [CCh] [00h] [00h] [XXh] [Check Sum]

Return Data

[C5h] [CCh] [00h] [00h] [Camera ID] [Check Mode] [XXh] [XXh] [Check Sum]

Parameter Description

- * Camera ID -> Means the assigned "Camera ID" on camera that is connected with controller.
Data Range: 00h(0d) ~ FFh(255d)
- * Check Mode -> Means ON/OFF mode by the inspection of camera ID number when it is controlled by remote.
- * XXh -> Means "Don't care data" and declared "XXh".

Check Mode	Description
00h	<ul style="list-style-type: none">•Camera is "Camera ID Number Check Off Mode".•In this case Remote Control is possible at the Works differently camera ID number between Controller and Camera (Only possible under 1 to 1 controlling).
FFh	<ul style="list-style-type: none">•Camera is "Camera ID Number Check On Mode".•In this case Remote Control is possible at the same camera ID number between Controller and Camera.

2. Change Camera ID

2. Change Camera ID

This command is to change the camera ID number which is connected as New ID number or Enable or Disable a "Camera ID Number Check Mode".

Control Command

[C5h] [78h] [New Camera ID] [Check Mode] [Camera ID] [Check Sum]

Return Data

[C5h] [78h] [New Camera ID] [Check Mode] [New Camera ID] [XXh] [XXh] [XXh] [Check Sum]

Parameter Description

- * Camera ID -> Assigned Camera ID that is controlled by remote.
- * New Camera ID -> New ID that you try to change.
Possible ID change range is from "0d(00h)" to "255d(FFh)".
- * Check Mode -> Setup On/Off of camera ID number inspection in case of remote controlling.

Check Mode	Description
00h	Set the camera to "Camera ID Number Check Off Mode". Here the new camera ID will be ignored.
Other Values	Set the camera to "Camera ID Number Check On Mode". Here the camera ID is changed to New Camera ID.

3. Camera ID Display ON/OFF control

Change the Camera ID display mode of camera according to the data "Mode".

1) PC -> Camera

0xC5	0xAA	0x96	Mode	CAM_ID	C-S
------	------	------	------	--------	-----

2) Camera -> PC

0xC5	0xAA	0x96	Mode	0x96	0xFF	0xFF	0xFF	C-S
------	------	------	------	------	------	------	------	-----

mode :: This is a data for setting the Camera ID Display Mode.

In case of Mode = 0x01, the Camera ID number is displayed on the screen (Display ON mode).

In case of Mode = 0x00, the Camera ID number is not displayed on the screen (Display OFF mode).

Otherwise, The Camera ID Display mode is not changed.

Caution: If the Camera ID is 0x00, then the Camera ID is displayed on the screen at any time.

4. Camera Restart

; Restart the Camera.

1) PC -> Camera

0xC5	0x4F	0x00	0x00	CAM_ID	C-S
------	------	------	------	--------	-----

0xC5	0x4F	0x00	0x00	0x00	0xFF	0xFF	0xFF	C-S
------	------	------	------	------	------	------	------	-----

5. Camera Power Off; Turn off power of Camera.

Change the Camera ID display mode of camera according to the data "Mode".

1) PC -> Camera

0xC5	0x3E	0x00	0x00	CAM_ID	C-S
------	------	------	------	--------	-----

2) Camera -> PC

0xC5	0x3E	0x00	0x00	0x00	0xXX	0xXX	0xXX	C-S
------	------	------	------	------	------	------	------	-----

6. Camera Power ON; Turn on the power of Camera.

1) PC -> Camera

0xC5	0x3A	0x00	0x00	CAM_ID	C-S
------	------	------	------	--------	-----

2) Camera -> PC

0xC5	0x3A	0x00	0x00	0x00	0x00	0xXX	0xXX	C-S
------	------	------	------	------	------	------	------	-----

7. MENU OSD Display ON/OFF Setting

Set the MENU OSD Display mode of the camera to ON or OFF according to the data of "MODE".

1) PC -> Camera

0xC5	0xAA	0x63	MODE	CAM_ID	C-S
------	------	------	------	--------	-----

2) Camera -> PC

0xC5	0xAA	0x63	MODE	0x63	0xFF	0xFF	0xFF	C-S
------	------	------	------	------	------	------	------	-----

MODE: In case of MODE = 0x01, MENU OSD Display mode is changed to ON mode.
In case of MODE = 0x00, MENU OSD Display mode is changed to OFF mode
Otherwise, MENU OSD Display mode is not changed.

8. Camera Initialization

Initialize all setting states of the camera.

1) PC -> Camera

0xC5	0x6F	0x00	0x00	CAM_ID	C-S
------	------	------	------	--------	-----

2) Camera -> PC

0xC5	0x6F	0x00	0x00	0x00	0xFF	0xFF	0xFF	C-S
------	------	------	------	------	------	------	------	-----

9. BACKLIGHT ON/OFF control

Switch the BACKLIGHT mode to ON/OFF according to the data of "MODE".

1) PC -> Camera

0xC5	0xAA	0x70	MODE	CAM_ID	C S
------	------	------	------	--------	-----

2) Camera -> PC

0xC5	0xAA	0x70	MODE	0x70	0xFF	0xFF	0xFF	C S
------	------	------	------	------	------	------	------	-----

MODE: In case of MODE = 0x01, MENU OSD Display mode is changed to ON mode.
In case of MODE = 0x00, MENU OSD Display mode is changed to OFF mode
Otherwise, MENU OSD Display mode is not changed.

10. COLOR ON/OFF control

Switch the COLOR mode to ON/OFF according to the data of "MODE".

1) PC -> Camera

0xC5	0xAA	0x71	MODE	CAM_ID	C S
------	------	------	------	--------	-----

2) Camera -> PC

0xC5	0xAA	0x71	MODE	0x71	0xFF	0xFF	0xFF	C S
------	------	------	------	------	------	------	------	-----

MODE: In case of MODE = 0x01, The BACKLIGHT mode becomes ON mode.
In case of MODE = 0x00, The BACKLIGHT mode becomes OFFmode.
Otherwise, The BACKLIGHT mode is not changed.

11. 100% NEGATIVE ON/OFF control

Switch the 100% NEGATIVE mode to ON/OFF according to data of "MODE".

1) PC -> Camera

0xC5	0xAA	0x72	MODE	CAM_ID		C S
------	------	------	------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x72	MODE	0x72	0xFF	0xFF	0xFF	C S
------	------	------	------	------	------	------	------	-----

MODE: In case of MODE = 0x01, The 100% NEGATIVE mode becomes ON mode.
In case of MODE = 0x00, The 100% NEGATIVE mode becomes OFFmode.
Otherwise, The 100% NEGATIVE mode is not changed.

12. FOCUS Mode Setting

Change "Focus Action Mode" of the connected camera.

Control Command

[C5h][AAh][73h][Focus Mode][Camera ID][Check Sum]

Return Data

[C5h][AAh][73h][Focus Mode][73h][XXh][XXh][XXh][Check Sum]

Parameter Description

*Focus Mode -> Means data to indicate "Focus Operation Mode".
"Focus Action Mode" according to each data are, as followings.

Focus Mode	Description
00h	<ul style="list-style-type: none"> • Set "Focus Action Mode" to "Focus Auto/Manual AUTO Mode". • Camera Fulfill "Auto Focus Action". • If "Focus Auto/Manual Or Push Auto" key is inputted, "Focus Action Mode" is changed to "Focus Auto/Manual MANUAL Mode".
01h	<ul style="list-style-type: none"> • Set "Focus Action Mode" to "Focus Auto Manual MANUAL Mode". • Camera Fulfill "Manual Focus Action". • If "Focus Auto/Manual Or Push Auto" key is inputted, "Focus Action Mode" is changed to "Focus Auto/Manual AUTO Mode".
02h	<ul style="list-style-type: none"> • Set "Focus Action Mode" to "Focus PUSH AUTO Mode". • Camera Fulfill "Manual Focus Action". • While "Focus Auto/Manual Or Push Auto" key is inputted, "Auto Focus" is Fulfilled.
Other Values	<ul style="list-style-type: none"> • Ignored.

13. FLICKERLESS Mode ON/OFF Setting

Switch the FLICKERLESS mode to ON/OFF according to the data of "MODE"

1) PC -> Camera

0xC5	0xAA	0x74	MODE	CAM_ID		C S
------	------	------	------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x74	MODE	0XXX	0XX	0XX	0XX	C S
------	------	------	------	------	-----	-----	-----	-----

MODE: In case of MODE = 0x01, The FLICKERLESS mode becomes "ON" mode.
In case of MODE = 0x00, The FLICKERLESS mode becomes "OFF" mode.
Otherwise, The FLICKERLESS mode is not changed.

14. White Balance Mode Set Command

Set the mode of White Balance according to WB_CNT.

1) PC -> Camera

0xC5	0xAA	0x66	WB_CNT	CAM_ID		C S
------	------	------	--------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x65	WB_CNT	0x65	0XX	0XX	0XX	C S
------	------	------	--------	------	-----	-----	-----	-----

MODE: This is a counter to change the mode of White Balance 1.
In case of WB_CNT= 0, the mode of White Balance becomes a "AUTO" mode. 2.
In case of WB_CNT= 1, the mode of White Balance becomes a "SPECIAL" mode. 3.
In case of WB_CNT= 2, the mode of White Balance becomes a "INDOOR" mode. 4.
In case of WB_CNT= 3, the mode of White Balance becomes a "OUTDOOR" mode. 5.
In case of WB_CNT= 4, the mode of White Balance becomes a "PUSH AUTO" mode.

15. SPECIAL White Balance Mode RED adjust data Setting

Set the RED adjust data at SPECIAL White Balance mode according to the data of "RED_ADJ".

1) PC -> Camera

0xC5	0xAA	0x75	RED_ADJ	CAM_ID		C S
------	------	------	---------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x75	RED_ADJ	0x75	0xFF	0xFF	0xFF	C S
------	------	------	---------	------	------	------	------	-----

RED_ADJ; This is a data for which adjusts a RED point at the Special White Balance mode.

data value setting:

Decimal data :	-3	-2	-1	0	+1	+2	+3
RED_ADJ data :	0xFD	0xFE	0xFF	0x00	0x01	0x02	0x03

16. SPECIAL White Balance Mode BLUE adjust data Setting

Set the BLUE adjust data at SPECIAL White Balance mode according to the data of "BLUE_ADJ".

1) PC -> Camera

0xC5	0xAA	0x67	BLUE_ADJ	CAM_ID		C S
------	------	------	----------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x76	BLUE_ADJ	0x76	0xFF	0xFF	0xFF	C S
------	------	------	----------	------	------	------	------	-----

BLUE_ADJ; This is a data for which adjusts a BLUE point at the Special White Balance mode.

data value setting:

Decimal data :	-3	-2	-1	0	+1	+2	+3
BLUE_ADJ data :	0xFD	0xFE	0xFF	0x00	0x01	0x02	0x03

17. Set Manual Red Gain

This commands is to set the value of Red Gain in "MANUAL White Balance Control Mode" or "PUSH AUTO White Balance Control Mode".

Caution ↑ It is valid when White Balance Control Mode is "MANUAL White Balance Control Mode" or "PUSH AUTO White Balance Control Mode".

Control Command

[C5h] [AAh] [A4h] [Red Gain] [Camera ID] [Check Sum]

Return Data

[C5h] [AAh] [A4h] [Red Gain] [A4h] [XXh] [XXh] [XXh] [Check Sum]

Parameter Description

* Red Gain -> Means data to indicate value of Red Gain Control has range from "00h(Min)" ~ "FFh(Max)".

18. Set Manual Blue Gain

This commands is to set the value of Blue Gain in "MANUAL White Balance Control Mode" or "PUSH AUTO White Balance Control Mode".

Caution ↑ It is valid when White Balance Control Mode is "MANUAL White Balance Control Mode" or "PUSH AUTO White Balance Control Mode".

Control Command

[C5h] [AAh] [A6h] [Blue Gain] [Camera ID] [Check Sum]

Return Data

[C5h] [AAh] [A6h] [Blue Gain] [A4h] [XXh] [XXh] [XXh] [Check Sum]

Parameter Description

* Blue Gain -> Means data to indicate value of Blue Gain Control has range from "00h(Min)" ~ "FFh(Max)".

19. White Balance PUSH_AUTO ON/OFF Setting

Switch the PUSH AUTO White Balance state to ON or OFF White Balance mode according to the data of "MODE".

1) PC -> Camera

0xC5	0xAA	0x78	MODE	CAM_ID		C S
------	------	------	------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x78	MODE	0x78	0xFF	0xFF	0xFF	C S
------	------	------	------	------	------	------	------	-----

MODE :: In case of MODE = 0x01, The PUSH AUTO White Balance state becomes to ON.
In case of MODE = 0x00, The PUSH AUTO White Balance state becomes to OFF.
Otherwise, The PUSH AUTO White Balance state is not changed.

Caution :: This mode is not saved when the power of a camera turns OFF/ON.
Default mode is "OFF" mode.

20. SHARPNESS Data Setting

Set the sharpness level of the camera according to the data of "sharpness".

1) PC -> Camera

0xC5	0xAA	0x79	Sharpness	CAM_ID		C S
------	------	------	-----------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x79	Sharpness	0x79	0xFF	0xFF	0xFF	C S
------	------	------	-----------	------	------	------	------	-----

Sharpness ; This is a data for which adjusts a sharpness level of the camera.
Data Value range :: 00d ~ 15d

21. BRIGHTNESS Data Setting

Set the brightness level of the camera according to the data of "Brightness".

1) PC -> Camera

0xC5	0xAA	END	0x00	CAM_ID		C S
------	------	-----	------	--------	--	-----

2) Camera -> PC

0xC5	0x62	END	0x00	END	0XX	0XX	0XX	C S
------	------	-----	------	-----	-----	-----	-----	-----

Brightness ; This is a data for which adjusts a brightness level of the camera.

22. ZOOM START Data Setting

Set the zoom start magnification of the camera according to the data of "Start".

1) PC -> Camera

0xC5	0x60	Start	0x00	CAM_ID		C S
------	------	-------	------	--------	--	-----

2) Camera -> PC

0xC5	0x58	Start	0x00	Start	0XX	0XX	0XX	C S
------	------	-------	------	-------	-----	-----	-----	-----

Start : This is a data for which adjusts a zoom start magnification of the camera.
This range of this data is from 0x01 (means x1) to 0x15 (means x21)

23. ZOOM END Data Setting

Set the zoom end magnification of the camera according to the data of "End

1) PC -> Camera

0xC5	0x62	0x7A	Brightness	CAM_ID		C S
------	------	------	------------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x7A	Brightness	0x7A	0xFF	0xFF	0xFF	C S
------	------	------	------------	------	------	------	------	-----

End : This is a data for which adjusts a zoom end magnification of the camera.
This range of this data is from 0x02(meansx1) to the max power of the camera.

24. FOCUS FROM Data Setting

Set the focus limit distance of the camera according to the data of "Limit".

1) PC -> Camera

0xC5	0x58	Limit	0x00	CAM_ID		C S
------	------	-------	------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	Limit	0x00	Limit	0xFF	0xFF	0xFF	C S
------	------	-------	------	-------	------	------	------	-----

Limit : This is a data for which adjusts a focus limit distance of the camera.
In case of Limit = 0x00, the range of focusing is from 1cm to infinite.
In case of Limit = 0x01, the range of focusing is from 10cm to infinite.
In case of Limit = 0x02, the range of focusing is from 50cm to infinite.
In case of Limit = 0x03, the range of focusing is from 1m to infinite.
In case of Limit = 0x04, the range of focusing is from 3m to infinite.
In case of Limit = 0x05, the range of focusing is from 5m to infinite.
In case of Limit = 0x06, the range of focusing is infinite only.

25. Exposure Mode Set Command

Set the mode of Exposure according to AEmodeCNT

1) PC -> Camera

0xC5	0xAA	0x60	AEmodeCNT	CAM_ID		C S
------	------	------	-----------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x60	AEmodeCNT	0x60	0xFF	0xFF	0xFF	C S
------	------	------	-----------	------	------	------	------	-----

AEmodeCNT :

The counter for setting Exposure mode

1. In case of AEmodeCNT = 0x00, the Exposure mode becomes a "AUTO" mode.
2. In case of AEmodeCNT = 0x01, This mode does not use.
3. In case of AEmodeCNT = 0x02, the Exposure mode becomes a "IRIS FIX" mode.
And you can adjust "IRIS level" only.
4. In case of AEmodeCNT = 0x03, the Exposure mode becomes a "AGC FIX" mode.
And you can adjust "AGC level" only.
5. In case of AEmodeCNT = 0x04, the Exposure mode becomes a "MANUAL" mode.
And you can adjust all (i.e., IRIS, and AGC).

26. SHUTTER Speed Setting

Set the shutter speed of the camera according to the data of "SSS_CNT".

1) PC -> Camera

0xC5	0xAA	0x78	SSC_CNT	CAM_ID	C S
------	------	------	---------	--------	-----

2) Camera -> PC

0xC5	0xAA	0x78	SSC_CNT	0x78	0xFF	0xFF	0xFF	C S
------	------	------	---------	------	------	------	------	-----

SSC_CNT	NTSC	PAL	SSC_CNT	NTSC	PAL
0	1/60	1/60	14	1/1000	1/1000
1	1/125	1/125	15	1/1100	1/1100
2	1/150	1/150	16	1/1200	1/1200
3	1/200	1/200	17	1/1300	1/1300
4	1/250	1/250	18	1/1500	1/1500
5	1/300	1/300	19	1/1600	1/1600
6	1/350	1/350	20	1/1800	1/1800
7	1/400	1/400	21	1/2000	1/2000
8	1/450	1/450	22	1/2500	1/2500
9	1/500	1/500	23	1/3000	1/3000
10	1/600	1/600	24	1/3500	1/3500
11	1/700	1/700	25	1/4000	1/4000
12	1/800	1/800	26	1/6000	1/6000
13	1/900	1/900	27	1/1000	1/10000

27. IRIS OPEN Level Setting

Set the IRIS OPEN Level of the camera according to the data of "IRIS_CTL". 1) PC -> Camera

1) PC -> Camera

0xC5	0xAA	0x7C	IRIS_CTL	CAM_ID		C S
------	------	------	----------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x7C	IRIS_CTL	0x7C	0xFF	0xFF	0xFF	C S
------	------	------	----------	------	------	------	------	-----

28. AGC Level Setting

Set the AGC Level of the camera according to the data of "AGC_CTL".

1) PC -> Camera

0xC5	0xAA	0x7D	AGC_CTL	CAM_ID		C S
------	------	------	---------	--------	--	-----

2) Camera -> PC

0xC5	0xAA	0x7D	AGC_CTL	0x7D	0xFF	0xFF	0x00	C S
------	------	------	---------	------	------	------	------	-----

AGC_CTL ;

This is a data for which adjusts a AGC level of the camera.

Data value range :: 00d(Minimum AGC Level) ~ 255d(Maximum AGC Level)

29. Set Function OSD Display On/Off Mode Register

This command is to set the value of Camera's Function OSD Display On/Off Register directly and mode of each Display On/Off for Function OSD.

Display On/Off Mode

Display On Mode -> Function OSD displays on screen in the key event.
Display Off Mode -> Function OSD doesn't display on screen in the key event.

Control Command

[C5h] [AAh] [64h] [FOSD_DISP] [Camera ID] [Check Sum]

Return Data

[C5h] [AAh] [64h] [FOSD_DISP] [64h] [XXh] [XXh] [XXh] [Check Sum]

Parameter Description

* FOSD_DISP -> This means data to indicate the value of "Function OSD Display On/Off Register" of camera.

It displays "On/Off Mode" of "Function OSD". Bit fields have meanings for "Display On/Off Mode" of each Function OSD.

In case "0" -> bit field according to Bit 0 ~ Bit 5 means "**Display Off Mode**".

In case "1" -> bit field according to Bit 0 ~ Bit 5 means "**Display On Mode**".

Bit of FOSD_DISP	Description
Bit 7	<ul style="list-style-type: none"> Means value of OR operation among Function OSD fields from Bit 0 to Bit 5. 1 -> have at least one of "Display On Mode" among Function OSD fields from Bit 0 to Bit 5. 0 -> have not "Display On Mode" among Function OSD fields from Bit 0 to Bit 5.
Bit 6	<ul style="list-style-type: none"> Not used.
Bit 5	<ul style="list-style-type: none"> Means setting value of "Display On/Off Mode" for "Normal Function OSD". Normal Function OSD -> Focus Mode, Backlight, Shutter, Flickerless, White Balance Control Mode
Bit 4	<ul style="list-style-type: none"> Means setting value of "Display On/Off Mode" for "Motion Detection Alarm Out" Function OSD.
Bit 3	<ul style="list-style-type: none"> Means setting value of "Display On/Off Mode" for "Camera ID number" Function OSD.
Bit 2	<ul style="list-style-type: none"> Means setting value of "Display On/Off Mode" for "Zoom Magnification" Function OSD.
Bit 1	<ul style="list-style-type: none"> Means setting value of "Display On/Off Mode" for "User Title" Function OSD.
Bit 0	<ul style="list-style-type: none"> Means setting value of "Display On/Off Mode" for "Power ON Initial Title" Function OSD.

30. Key Action : Perform the Key action according to the data of “KEY CODE”.

Caution: After using the Key action, Camera has to be notified by stop of key action code “KN_STOP”.

1) PC -> Camera

0xC5	0x5F	KEY_CODE	0x00	CAM_ID		C S
------	------	----------	------	--------	--	-----

2) Camera -> PC

0xC5	0x5F	KEY_CODE	0x00	KEY_CODE	0xXX	0xXX	0xXX	C S
------	------	----------	------	----------	------	------	------	-----

KEY CODE ; The Key code for operation (Refer to “Key Code Table”).

3. Key Code Table for "Camera Key Action Control Command"

1. Key Code Table related to Focus Mode

Key Name	Key Code	Description
Focus Mode Selection	51h	<ul style="list-style-type: none">• Change Focus Action Mode. (-> Focus Auto/Manual AUTO Mode -> Focus Auto/Manual MANUAL Mode -> Focus PUSH AUTO Mode -> Focus Auto/Manual AUTO Mode")
Focus Auto/Manual or Push Auto (Menu Item Down Selection)	05h	<ul style="list-style-type: none">• Works differently according to Focus Action Mode.• In case of "Focus Auto/Manual AUTO Mode" or "Focus Auto/Manual MANUAL Mode" -> Toggle Focus Action Mode to "Focus Auto/Manual AUTO Mode" or "Focus Auto/Manual MANUAL Mode".• In case of "Focus PUSH AUTO Mode" -> Auto Focus operates while the key is pushed.• In case of displaying "Menu OSD", operates Menu Item Down Selection Key Action.
Focus Auto/Manual or Push Auto	3Fh	<ul style="list-style-type: none">• Works differently according to Focus Action Mode.• In case of "Focus Auto/Manual AUTO Mode" or "Focus Auto/Manual MANUAL Mode" -> Toggle Focus Action Mode to "Focus Auto/Manual AUTO Mode" or "Focus Auto/Manual MANUAL Mode".

Key Name	Key Code	Description
		<ul style="list-style-type: none"> In case of "Focus PUSH AUTO Mode" -> Auto Focus operates while the key is pushed.
Focus Auto/Manual	06h	<ul style="list-style-type: none"> Toggle Focus Action Mode to "Focus Auto/Manual AUTO Mode" or "Focus Auto/Manual MANUAL Mode". Caution ↑ It is valid when Focus Action Mode is "Focus Auto/Manual AUTO Mode" or "Focus Auto/Manual MANUAL Mode". Camera operates in a wrong way under "Focus PUSH AUTO Mode".
Focus Push Auto or Push Auto	07h	<ul style="list-style-type: none"> Auto Focus operates while this key is pushed. Caution ↑ It is valid when Focus Action Mode is "Focus PUSH AUTO Mode". Camera operates in a wrong way under "Focus Auto/Manual AUTO Mode" or "Focus Auto/Manual MANUAL Mode".

2. Key Code Table related to Manual Focus Action

Caution: ↑ It is key about Manual Focusing Action. It is valid when Focus Action Mode is "Focus Auto/Manual MANUAL Mode" or "Focus PUSH AUTO Mode".

Key Name	Key Code	Description
Quick Speed FAR (Menu Data Down Change)	08h	<ul style="list-style-type: none">• Fulfill Quick Speed Manual Focus FAR Move Action.• In Menu OSD Displayed, Fulfill Menu Data Down Change Key Action.
Quick Speed NEAR (Menu Data Up Change)	09h	<ul style="list-style-type: none">• Fulfill Quick Speed Manual Focus NEAR Move Action.• In Menu OSD Displayed, Fulfill Menu Data Up Change Key Action.
Slow Speed FAR (Menu Data Down Change)	38h	<ul style="list-style-type: none">• Fulfill Slow Speed Manual Focus FAR Move Action.• In Menu OSD Displayed, Fulfill Menu Data Down Change Key Action.
Slow Speed NEAR (Menu Data Up Change)	39h	<ul style="list-style-type: none">• Fulfill Slow Speed Manual Focus NEAR Move Action.• In Menu OSD Displayed, Fulfill Menu Data Up Change Key Action.
1step FAR (Menu Data Down Change)	0Ah	<ul style="list-style-type: none">• Move Focus Lens forward FAR by 1step.• In Menu OSD Displayed, Fulfill Menu Data Down Change Key Action.

Key Name	Key Code	Description
1step NEAR (Menu Data Up Change)	0Bh	<ul style="list-style-type: none"> • Move Focus Lens forward NEAR by 1step. • In Menu OSD Displayed, Fulfill Menu Data Up Change Key Action.
Quick Speed FAR Only	70h	<ul style="list-style-type: none"> • Fulfill only Quick Speed Manual Focus FAR Move Action.
Quick Speed NEAR Only	71h	<ul style="list-style-type: none"> • Fulfill only Quick Speed Manual Focus NEAR Move Action.
Slow Speed FAR Only	74h	<ul style="list-style-type: none"> • Fulfill only Slow Speed Manual Focus FAR Move Action.
Slow Speed NEAR Only	75h	<ul style="list-style-type: none"> • Fulfill only Slow Speed Manual Focus NEAR Move Action.
1step FAR Only	72h	<ul style="list-style-type: none"> • Move Only Focus Lens forward FAR by 1step.
1step NEAR Only	73h	<ul style="list-style-type: none"> • Move Only Focus Lens forward NEAR by 1step.
60pps Speed FAR	82h	<ul style="list-style-type: none"> • Fulfill Manual Focus FAR Move Action at 60pps Speed.
120pps Speed FAR	83h	<ul style="list-style-type: none"> • Fulfill Manual Focus FAR Move Action at 120pps Speed.
180pps Speed FAR	84h	<ul style="list-style-type: none"> • Fulfill Manual Focus FAR Move Action at 180pps Speed.
240pps Speed FAR	85h	<ul style="list-style-type: none"> • Fulfill Manual Focus FAR Move Action at 240pps Speed.
300pps Speed FAR	86h	<ul style="list-style-type: none"> • Fulfill Manual Focus FAR Move Action at 300pps Speed.

Key Name	Key Code	Description
360pps Speed FAR	87h	<ul style="list-style-type: none"> Fulfill Manual Focus FAR Move Action at 360pps Speed.
420pps Speed FAR	88h	<ul style="list-style-type: none"> Fulfill Manual Focus FAR Move Action at 420pps Speed.
60pps Speed NEAR	89h	<ul style="list-style-type: none"> Fulfill Manual Focus NEAR Move Action at 60pps Speed.
120pps Speed NEAR	8Ah	<ul style="list-style-type: none"> Fulfill Manual Focus NEAR Move Action at 120pps Speed.
180pps Speed NEAR	8Bh	<ul style="list-style-type: none"> Fulfill Manual Focus NEAR Move Action at 180pps Speed.
240pps Speed NEAR	8Ch	<ul style="list-style-type: none"> Fulfill Manual Focus NEAR Move Action at 240pps Speed.
300pps Speed NEAR	8Dh	<ul style="list-style-type: none"> Fulfill Manual Focus NEAR Move Action at 300pps Speed.
360pps Speed NEAR	8Eh	<ul style="list-style-type: none"> Fulfill Manual Focus NEAR Move Action at 360pps Speed.
420pps Speed NEAR	8Fh	<ul style="list-style-type: none"> Fulfill Manual Focus NEAR Move Action at 420pps Speed.

3. Key Code Table related to Zoom In/Out Action

Key Name	Key Code	Description
Slow Speed Zoom In (Menu Item Up Selection)	01h (or 34h)	<ul style="list-style-type: none"> • Fulfill Slow Speed (9sec) Zoom In Action. • In Menu OSD Displayed, Fulfill Menu Item Up Selection Key Action.
Slow Speed Zoom Out (Menu Item Down Selection)	03h (or 36h)	<ul style="list-style-type: none"> • Fulfill Slow Speed (9sec) Zoom Out Action. • In Menu OSD Displayed, Fulfill Menu Item Down Selection Key Action.
Middle Speed Zoom In (Menu Item Up Selection)	7Ch	<ul style="list-style-type: none"> • Fulfill Middle Speed (7sec) Zoom In Action. • In Menu OSD Displayed, Fulfill Menu Item Up Selection Key Action.
Middle Speed Zoom Out (Menu Item Down Selection)	80h	<ul style="list-style-type: none"> • Fulfill Middle Speed (7sec) Zoom Out Action. • In Menu OSD Displayed, Fulfill Menu Item Down Selection Key Action.
Quick Speed Zoom In (Menu Item Up Selection)	02h (or 35h)	<ul style="list-style-type: none"> • Fulfill Quick Speed (5sec) Zoom In Action. • In Menu OSD Displayed, Fulfill Menu Item Up Selection Key Action.
Quick Speed Zoom OUT (Menu Item Up Selection)	04h (or 37h)	<ul style="list-style-type: none"> • Fulfill Quick Speed (5sec) Zoom Out Action. • In Menu OSD Displayed, Fulfill Menu Item Down Selection Key Action.

Key Name	Key Code	Description
Selected Speed Zoom In (Menu Item Up Selection)	7Bh	<ul style="list-style-type: none"> • Fulfill Zoom In Action as "Zoom Tracking Speed" set in Camera. • In Menu OSD Displayed, Fulfill Menu Item Up Selection Key Action.
Selected Speed Zoom Out (Menu Item Down Selection)	7Fh	<ul style="list-style-type: none"> • Fulfill Zoom Out Action as "Zoom Tracking Speed" set in Camera. • In Menu OSD Displayed, Fulfill Item Down Selection Key Action.
Slow Speed Zoom In Only	68h (or 6Ch)	<ul style="list-style-type: none"> • Fulfill only Slow Speed (9sec) Zoom Out Action.
Middle Speed Zoom In Only	7Ah	<ul style="list-style-type: none"> • Fulfill only Middle Speed (7sec) Zoom In Action.
Middle Speed Zoom Out Only	7Eh	<ul style="list-style-type: none"> • Fulfill only Middle Speed (7sec) Zoom Out Action.
Quick Speed Zoom In Only	69h (or 6Dh)	<ul style="list-style-type: none"> • Fulfill only Quick Speed (5sec) Zoom In Action.
Quick Speed Zoom Out Only	6Bh (or 6Fh)	<ul style="list-style-type: none"> • Fulfill only Quick Speed (5sec) Zoom Out Action.
Selected Speed Zoom In Only	79h	<ul style="list-style-type: none"> • Fulfill only Zoom In Action as Speed set in Menu.

Key Name	Key Code	Description
Selected Speed Zoom Out Only	7Dh	<ul style="list-style-type: none"> Fulfill only Zoom Out Action as Speed set in Menu.
Optical 8x Auto Zoom In/Out	56h	<ul style="list-style-type: none"> Fulfill automatically Zoom In/Out Action in Slow Speed with rotation of the order "-> 8x -> 1x".

4. Key Code Table related to Digital Zoom Action

Key Name	Key Code	Description
Digital Zoom On/Off	22h	<ul style="list-style-type: none"> Set Digital Zoom Mode to On/Off. In case "Digital Zoom Off Mode" <ul style="list-style-type: none"> -> Zoom magnification Display becomes "X1" and Fulfill Zoom In/Out in Optical Zoom Region only. In case "Digital Zoom On Mode" <ul style="list-style-type: none"> -> Zoom magnification Display becomes "DX1" and Fulfill Zoom In/Out in Optical and Digital Zoom Region.
Instant Digital Zoom Mode Scroll Change	59h	<ul style="list-style-type: none"> Rotate Instant Digital Zoom Mode with order (OFF -> x2 -> x4 -> x8 -> OFF). In case "Instant Digital Zoom Mode", Fulfill Zoom In/Out Action in Optical Zoom Region only, in state that Digital Zoom magnification (x2, x4, x8) is adjusted. OFF Mode means that Instant Digital Zoom is off.

Key Name	Key Code	Description
Instant Digital Zoom Off	62h	<ul style="list-style-type: none"> Set Instant Digital Zoom to off.
Instant Digital Zoom x2 Setting	63h	<ul style="list-style-type: none"> Set Instant Digital Zoom Mode to "x2 Mode". Fulfill Zoom In/Out Action in Optical Zoom Region only in state that 2x Digital Zoom is ON and displays "IDX2 ~ IDX54" format. Set Instant Digital Zoom Mode to "x4 Mode".
Instant Digital Zoom x4 Setting	64h	<ul style="list-style-type: none"> Fulfill Zoom In/Out Action in Optical Zoom Region only in state that 4x Digital Zoom is ON and displays "IDX4 ~ IDX108" format.
Instant Digital Zoom x8 Setting	65h	<ul style="list-style-type: none"> Set Instant Digital Zoom Mode to "x8 Mode". Fulfill Zoom In/Out Action in Optical Zoom Region only in state that 8x Digital Zoom is ON and displays "IDX8 ~IDX216" format.
Instant Digital Zoom x2 Mode On/Off Toggle	76h	<ul style="list-style-type: none"> Toggle Instant Digital Zoom Mode to between "x2 Mode" and "OFF Mode".
Instant DigitalZoom x4 Mode On/Off Toggle	77h	<ul style="list-style-type: none"> Toggle Instant Digital Zoom Mode to between "x4 Mode" and "OFF Mode".
Instant DigitalZoom x4 Mode On/Off Toggle	78h	<ul style="list-style-type: none"> Toggle Instant Digital Zoom Mode to between "x8 Mode" and "OFF Mode".

5. Key Code Table related to Digital Pan/Tilt Action

It is valid when Instant Digital Zoom Mode is x2, x4, x8 Mode or Zoom magnification is in Digital Zoom Region while Digital Zoom operates.

Key Name	Key Code	Description
Right Direction Digital Panning	5Eh	<ul style="list-style-type: none">Fulfill Digital Panning Action forward right direction while this key is pushed and If this key is continuously pushed over 2 seconds, Fulfill Continuous Digital Panning Action (Right End <- -> Left End).
Left Direction Digital Panning	5Fh	<ul style="list-style-type: none">Fulfill Digital Panning Action forward left direction while this key is pushed and If this key is continuously pushed over 2sec, Fulfill Continuous Digital Panning Action (Right End <- -> Left End).
Up Direction Digital Tilting	60h	<ul style="list-style-type: none">Fulfill Digital Tilting Action upward while this key is pushed.
Down Direction Digital Tilting	61h	<ul style="list-style-type: none">Fulfill Digital Tilting Action downward while this key is pushed.

6. Key Code Table related to Digital Effect Action

Key Name	Key Code	Description
Digital Effect Scroll Change	0Eh	<ul style="list-style-type: none"> • Fulfill Digital Effect in order. • The order of Digital Effect WIDE VISION -> ART -> MIRROR -> 100% NEGATIVE -> 80% NEGATIVE -> Color OFF -> MOSAIC <p>Caution ↑ There can exist in valid Digital Effects according to Camera Model.</p>
ART On/Off	1Ch	<ul style="list-style-type: none"> • Toggle ADR Digital Effect whenever this key is pushed.
MIRROR On/Off	1Dh	<ul style="list-style-type: none"> • Toggle MIRROR Digital Effect whenever this key is pushed.
100% NEGA On/Off	1Eh	<ul style="list-style-type: none"> • Toggle 100% NEGATIVE Digital Effect whenever this key is pushed. <p>Caution ↑ Color can be off when NEGATIVE is on according to Camera Model.</p>
80% NEGA On/Off	1Fh	<ul style="list-style-type: none"> • Toggle 80% NEGATIVE Digital Effect whenever this key is pushed.
WIDE VISION On/Off	20h	<ul style="list-style-type: none"> • Toggle WIDE VISION Digital Effect whenever this key is pushed.
Color On/Off	21h	<ul style="list-style-type: none"> • Toggle Color and Monochrome whenever this key is pushed.
MOSAIC On/Off	57h	<ul style="list-style-type: none"> • Toggle MOSAIC Digital Effect whenever this key is pushed.

7. Key Code Table related to Function & Menu OSD

Key Name	Key Code	Description
OSD On/Off And 2sec Menu OSD On	24h	<ul style="list-style-type: none"> • Function OSD Display is Toggled whenever this key is pushed. • If this key is pushed in Menu OSD Displayed, Menu OSD Display is off. • If this key is pushed over 2seconds, Menu OSD Display is On. • When Function OSD Display is on, Display is automatically off in 5 seconds.
Menu OSD On/Off Toggle	25h	<ul style="list-style-type: none"> • Menu OSD Display is toggled whenever this key is pushed.
Function OSD Display Mode On/Off Toggle	55h	<ul style="list-style-type: none"> • Function OSD Display Mode is toggled whenever this key is pushed. • In case of becoming Function OSD Display On Mode -> It is enabled that Function OSD is displayed on screen. • In case of becoming Function OSD Display Off Mode -> It is disabled that Function OSD is displayed on screen. Just, Function OSD is not displayed on screen.
Menu OSD On/Off And 2sec Function OSD Display Mode On/Off Toggle	92h	<ul style="list-style-type: none"> • Toggle Menu OSD Display Mode whenever this key is pushed. • If this key is pushed over 2 seconds, Menu OSD Display is OFF and "Function OSD Display Mode On/Off Toggle (Key Code = 55h)" key is Fulfilled.

Key Name	Key Code	Description
Menu Item Up Selection	4Fh	<ul style="list-style-type: none"> In case of displaying Menu OSD, Menu Item Up Selection is Fulfilled.
Menu Item Down Selection	26h (or 50h)	<ul style="list-style-type: none"> In case of displaying Menu OSD, Menu Item Down Selection is Fulfilled.
Menu Data Up Change	27h	<ul style="list-style-type: none"> In case of displaying Menu OSD, Selected Menu Item Data is changed up.
Menu Data Down Change	28h	<ul style="list-style-type: none"> In case of displaying Menu OSD, Selected Menu Item Data is changed down.
Menu Data All Initialization	23h (or 52h)	<ul style="list-style-type: none"> Initialize all item data in menu. <p>Caution ↑ It is Works differently from camera model.</p>

8. Key Code Table related to Exposure Action

Key Name	Key Code	Description
High Shutter Up Scroll Change	40h (or 0Fh)	<ul style="list-style-type: none"> High Shutter Speed is Scrolled toward increment. I f this key is pushed, DSS & Flickerless Mode is automatically expired.
High Shutter Down Scroll Change	41h (or 10h)	<ul style="list-style-type: none"> High Shutter Speed is Scrolled toward decrement. If this key is pushed, DSS & Flickerless Mode is automatically expired.

Key Name	Key Code	Description
Brightness Up Scroll Change	15h (or 3Ch, 46h)	<ul style="list-style-type: none"> Brightness level is Scrolled toward increment. It is invalid in case that Exposure Mode is "MANUAL Exposure Mode".
Brightness Down Scroll Change	16h (or 3Dh, 47h)	<ul style="list-style-type: none"> Brightness Level is Scrolled toward decrement. It is invalid in case that Exposure Mode is "MANUAL Exposure Mode".
Manual Iris Open Control	42h	<ul style="list-style-type: none"> Iris is controlled toward open. It is valid in case that Exposure Mode is "IRIS MANUAL Exposure Mode" or "MANUAL Exposure Mode".
Manual Iris Close Control	43h	<ul style="list-style-type: none"> Iris is controlled toward close. It is valid in case that Exposure Mode is "IRIS MANUAL Exposure Mode" or "MANUAL Exposure Mode".
Manual AGC Up Control	44h	<ul style="list-style-type: none"> AGC Level increase. It is valid in case that Exposure Mode is "AGC MANUAL Exposure Mode" or "MANUAL Exposure Mode".
Manual AGC Down Control	45h	<ul style="list-style-type: none"> AGC Level decrease. It is valid in case that Exposure Mode is "AGC MANUAL Exposure Mode" or "MANUAL Exposure Mode".
BLC On/Off And Auto BLC Mode On/Off	1Ah	<ul style="list-style-type: none"> Toggle Backlight Control On/Off, whenever this key is pushed. If this key is pushed in Auto Backlight Control Mode, Backlight Control becomes off.

Key Name	Key Code	Description
		<ul style="list-style-type: none"> If this key is pushed over 2 seconds, Auto Backlight Control becomes on.
Flickerless On/Of	1Bh	<ul style="list-style-type: none"> Toggle Flickerless Control Mode On/Off, whenever this key is pushed. In case Flickerless On, High Shutter Speed is <ul style="list-style-type: none"> -> NTSC Camera Flickerless ON High Shutter Speed :: 1/100 -> PAL Camera Flickerless ON High Shutter Speed :: 1/120

9. Key Code Table related to White Balance Action

Key Name	Key Code	Description
White Balance Control Mode Up Scroll Change	11h	<ul style="list-style-type: none"> White Balance Control Mode is Scrolled Up. (-> AUTO -> SPECIAL -> INDOOR -> OUTDOOR -> MANUAL -> PUSH AUTO -> AUTO ->)
White Balance Control Mode Down Scroll Change	12h	<ul style="list-style-type: none"> White Balance Control Mode is Scrolled Down. (-> PUSH AUTO -> MANUAL -> OUTDOOR -> INDOOR -> SPECIAL -> AUTO -> PUSH AUTO ->)
Red Color Up Change	48h	<ul style="list-style-type: none"> RED component of Control Data is increased. It operates like as followings according to White Balance Control Mode. In case of "SPECIAL White Balance Control Mode"

Key Name	Key Code	Description
		<ul style="list-style-type: none"> -> Increase compensation value for Red Gain. • In case of "MANUAL White Balance Control Mode" <ul style="list-style-type: none"> -> Increase directly value for Red Gain. • In case of "PUSH AUTO White Balance Control Mode" <ul style="list-style-type: none"> -> Increase Red Position value of Target White Point in Vector.
Red Color Down Change	49h	<ul style="list-style-type: none"> • RED component of Control Data is decreased. • It operates like as followings according to White Balance Control Mode. • In case of "SPECIAL White Balance Control Mode" <ul style="list-style-type: none"> -> Decrease compensation value of Red Gain. • In case of "MANUAL White Balance Control Mode" <ul style="list-style-type: none"> -> Decrease directly value of Red Gain. • In case of "PUSH AUTO White Balance Control Mode" <ul style="list-style-type: none"> -> Decrease Red Position value of Target White Point in Vector.
Blue Color UpChange	4Ah	<ul style="list-style-type: none"> • BLUE component of Control Data is increased. • It operates like as followings according to White Balance Control Mode. • In case of "SPECIAL White Balance Control Mode" <ul style="list-style-type: none"> -> Increase compensation value for Blue Gain. • In case of "MANUAL White Balance Control Mode" <ul style="list-style-type: none"> -> Increase directly value for Blue Gain. • In case of "PUSH AUTO White Balance Control Mode" <ul style="list-style-type: none"> -> Increase Blue Position value of Target White Point in Vector.

Key Name	Key Code	Description
Blue Color Down Change	4Bh	<ul style="list-style-type: none"> • BLUE component of Control Data is decreased. • It operates like as followings according to White Balance Control Mode. • In case of "SPECIAL White Balance Control Mode" <ul style="list-style-type: none"> -> Decrease compensation value of Blue Gain. • In case of "MANUAL White Balance Control Mode" <ul style="list-style-type: none"> -> Decrease directly value of Blue Gain. • In case of "PUSH AUTO White Balance Control Mode" <ul style="list-style-type: none"> -> Decrease Blue Position value of Target White Point in Vector.
Push-Auto White Balance Control On/Off	4Eh	<ul style="list-style-type: none"> • It Toggle White Balance Control Enable(On)/Disable(Off), whenever this key is pushed in "PUSH AUTO White Balance Control Mode".
Push-Auto White Balance Push Auto Control	58h	<ul style="list-style-type: none"> • White Balance traces white this key is pushed in "PUSH AUTO White Balance Control Mode". • White Balance Trace Action stop, when the key is release.
Push-Auto White Balance One Push Auto Control	81h	<ul style="list-style-type: none"> • White Balance traces automatically & stop if it is completed whenever this key is clicked in "PUSH AUTO White Balance Control Mode".

10. Key Code Table related to Special Function

Key Name	Key Code	Description
Sharpness Up Scroll Change	17h (or 53h)	<ul style="list-style-type: none">• Sharpness Data of camera is Scrolled Up.• The Order of Sharpness Data Scroll -> 0Fh -> 00h -> 01h -> 02h -> -> 0Eh -> 0Fh -> 00h -> 01h ->
Sharpness Down Scroll Change	18h (or 54h)	<ul style="list-style-type: none">• Sharpness Data of camera is Scrolled Down.• The Order of Sharpness Data Scroll -> 01h -> 00h -> 0Fh -> 0Eh -> -> 02h -> 01h -> 00h -> 0Fh ->
Freezer On/Off	91h	<ul style="list-style-type: none">• Toggle Camera's Video Out Signal Memory Still (Freezer).• Freezer On -> Still Video Signal Out.• Freezer Off -> Live Video Signal Out. <p>Caution ➡ It is valid about Camera with "Freezer" Function.</p>

Key Name	Key Code	Description
Stop Command	0Ch	<ul style="list-style-type: none">• Stop all actions that are being performed currently