Active Silicon

Harrier 10x Autofocus-Zoom SDI Camera

(3G-SDI/HD-SDI/EX-SDI/HD-TVI/CVBS)

AS-CAM-10SHD-A (issue 02)

Technical Reference Manual

Edition: v2.02

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Features

◆ **1/2.8“ Sony STARVIS CMOS sensor**
2.16M Pixels(Total) / 2.13M Pixels(Effective)

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

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

◆ **DAY & NIGHT (ICR)**
The ICR will automatically engage depending on the ambient light, allowing the camera to be effective in day&night environment.

◆ **WDR (Wide Dynamic Range)**
WDR applies an optimum fusion ratio when combining the high-speed shutter used in bright areas and the low speed shutter used in dark areas.

◆ **DNR (Digital Noise Reduction, 2D+3D)**
The DNR technology eliminates noise thus generating a distinct and clear image. This camera DNR function utilizes both an adaptive 2D filter reducing noise in the brightness of the image and an adaptive 3D filter reducing noise caused by movement.

◆ **Privacy mask Function**
The privacy zone function makes it possible to make specific areas of the scene from view.

◆ **On Screen Display**
This camera can be controlled by selecting text displayed on the monitor screen.

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

◆ **Output**
Digital output: 3G-SDI, HD-SDI, HD-TVI, EX-SDI
Analog output: NTSC, PAL Composite (without WDR)

◆ **Protocol**
This camera supports multiple protocols: VISCA, PELCO-D, PELCO-P

Cautions

◆ Power Supply

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

◆ Handling of the unit

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

◆ Operating and storage location

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

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

◆ Care of the unit

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

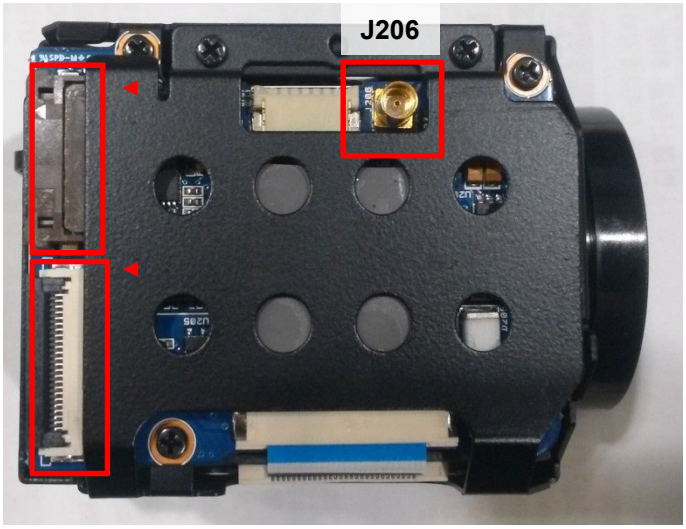
Specification

Model	AS-CAM-10SHD-A (issue 02)			
Image Sensor	1/2.8" Sony IMX462LQR-C CMOS Sensor			
Total Pixels	1,945(H) x 1,109(V), 2.16M Pixels			
Effective pixels	1,945(H) x 1,097(V), 2.13M Pixels			
Scanning system	Progressive Scan			
Sync. System	Internal			
Video Modes	Digital: 1080p/60(50)fps, 1080p/30(25)fps, 720p/60(50)fps, 720p/30(25)fps Analog: 700TVL			
Minimum Illumination	Color (1/30s, 60dB): 0.003 lux Color DSS (1/8s, 60dB): 0.00075 lux		BW (1/30s, 60dB): 0.0004lux BW DSS (1/8s, 60dB): 0.0001 lux	
Video Output	HD: 3G-SDI / HD-SDI / HD-TVI / EX-SDI Analog SD: VBS (without WDR)			
Signal-to-Noise (S/N) Ratio	more than 50dB (AGC off)			
Lens				
Lens type	10x Day & Night Zoom Lens			
Zoom Ratio	Optical x10, Digital x32 Zoom			
Focal Length	f = 5.1mm ~ 51mm			
Aperture Ratio	F1.6 (wide) ~ F1.8 (tele)			
Angle of View (D, H, V)	Wide	61.42°	54.74°	32.47°
	Tele	6.9°	6.01°	3.38°
Function				
Focus	Focus / Distance / Zoom Speed / Lens Refresh / E.Zoom			
Mode	Auto / One Push / Manual			
Distance	Wide: 0.1m Tele: 1.0m (near focus limit can also set to 3.0 / 5.0 / 10.0 m)			
Zoom Speed	0(Slow) ~ 7(Fast)			
Lens Refresh	One Push / 1 ~ 10Day			
E.Zoom	Off / MAX x2 ~ x32			
Zoom Preset	5 preset			
Exposure	Mode / AGC / Shut Speed / Iris / DSS / Flickerless / Brightness / WDR/BLC / D&N			
Mode	Auto / Iris. Priority / Shut. Priority / Manual			
AGC	(Gain Control) Off / On			
Shutter Speed	1/30(25) ~ 1/30,000 sec			
Iris	0 ~ 20 steps			
DSS	(Digital Slow Shutter) Off / x2 / x4 (/ x8: 60 or 50 fps mode only)			
Flickerless	Off / On			
Brightness	0 ~ 20 steps			
WDR/BLC	(Wide Dynamic Range / Back Light Compensation) OFF / WDR / BLC			
Day&Night	Auto / Day / Night / Ext-in			

Model	AS-CAM-10SHD-A
White Balance	Auto / One Push / Manual / Indoor / Outdoor
Image	HLC / DNR / Mirror / Sharpness / ACE / Defog / Freeze / Gamma
HLC	(High Light Compensation) Off / On / Night Only
DNR	(Digital Noise Reduction) Auto / Off / Low / Middle / High
Mirror	Off / H / V / H&V
Sharpness	0 ~ 10 steps
ACE	(Adaptive Contrast Enhancement) Off / Low / Middle / High
Defog	Off / On (Auto / Manual)
Freeze	Off / On
Gamma	0.45 / 0.55 / 0.65 / 0.75
Intelligence	Privacy / Motion / DIS
Privacy Mask	Off / On (24 masks)
Motion Detection	Off / On (3 regions)
Digital Image Stabilizer	Off / On
Special Function	Defect / Image Range / System / HD Format / EX-SDI / HD-TVI / COMM
Defect detection	Off / On
Image Range	Full / Comp. / User
System	NTSC / PAL
HD Format	1080p/30(25)fps / 1080p/60(50)fps / 720p/30(25)fps / 720p/60(50)fps
EX-SDI	Off / On (*Module Type Only)
HD-TVI	Off / On (*Module Type Only)
Communication	ID: 1 ~ 255
	Baud Rate: 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200
	Protocol: Pelco-P / Pelco-D / VISCA / Update
Display	Disp Sel / Set Title / Init Sel / Set Init Msg / Language
Select Display (Off / On)	ID / Title / Zoom Ratio / System Message
Set Title	Text Edit
Select Initial (Off / On)	ID / Baud Rate / Protocol / Version / Init. Message
Set Initial Message	Text Edit
Language	English / Simplified Chinese / Traditional Chinese / Japanese
Electrical	
Power Source	9V to 15V DC
Power Consumption	250mA
General	
Power Input	Connector
Video Output	Connector
Operating Temperature	-10℃ ~ +50℃ (Humidity: 0%RH ~ 90%RH)
Storage Temperature	-20℃ ~ +60℃ (Humidity: 0%RH ~ 90%RH)
External Dimension (mm)	62.4(L) x 43(W) x 44(H) mm
Weight	112g

Note: Active Silicon Harrier Camera Products are warrantied for six months from the shipment date. Design and specifications are subject to change without notice.

Connectors



J205		J204			
Pin No.	**Name**	**Pin No.**	**Name**	**Pin No.**	**Name**
1	RXD	1	GND	13	485-DIR
2	TXD	2	TxD	14	F/W SEL
3	GND	3	RxD	15	GND
4	DC12V IN	4	TVI ON	16	+5V OUT
5	GND	5	GND	17	GND
6	CVBS	6	TVI OUT	18	CVBS OUT
7	GND	7	GND	19	GND
8	TVI OUT	8	ADKEY	20	DC 12V
9	GND	9	IR ON	21	DC 12V
		10	D/N IN	22	DC 12V
		11	EX-SDI ON	23	DC 12V
		12	MD-OUT	24	DC 12V
Ref	6200-509-130 (KYOCERA)	Ref	05002HR-24J05 (YEONHO)		

J206	
1	HD-SDI Output
2	Board Ground
Ref	RF Connector – MMCX

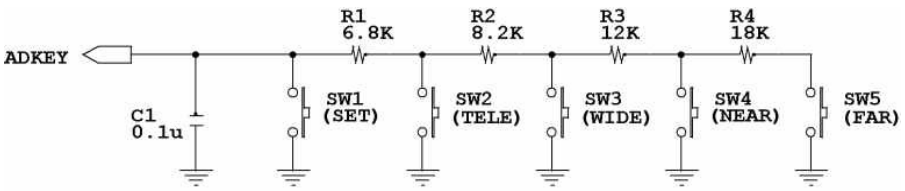
1. D&N IN (J204-10)

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

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

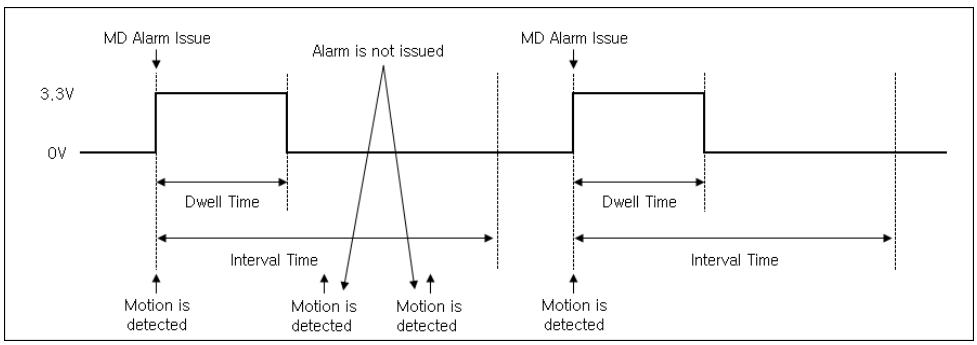
2. AD KEY (J204-8)

The external wired remote controller connecter.



3. MD (J204-12)

Port giving signal output of Motion Detection Alarm



4. 485-DIR (J204-13)

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

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

5. TVI ON (J204-4)

Port giving input of HD-TVI ON/OFF

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

6. EX-SDI ON (J204-11)

Port giving input of EX-SDI ON/OFF

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

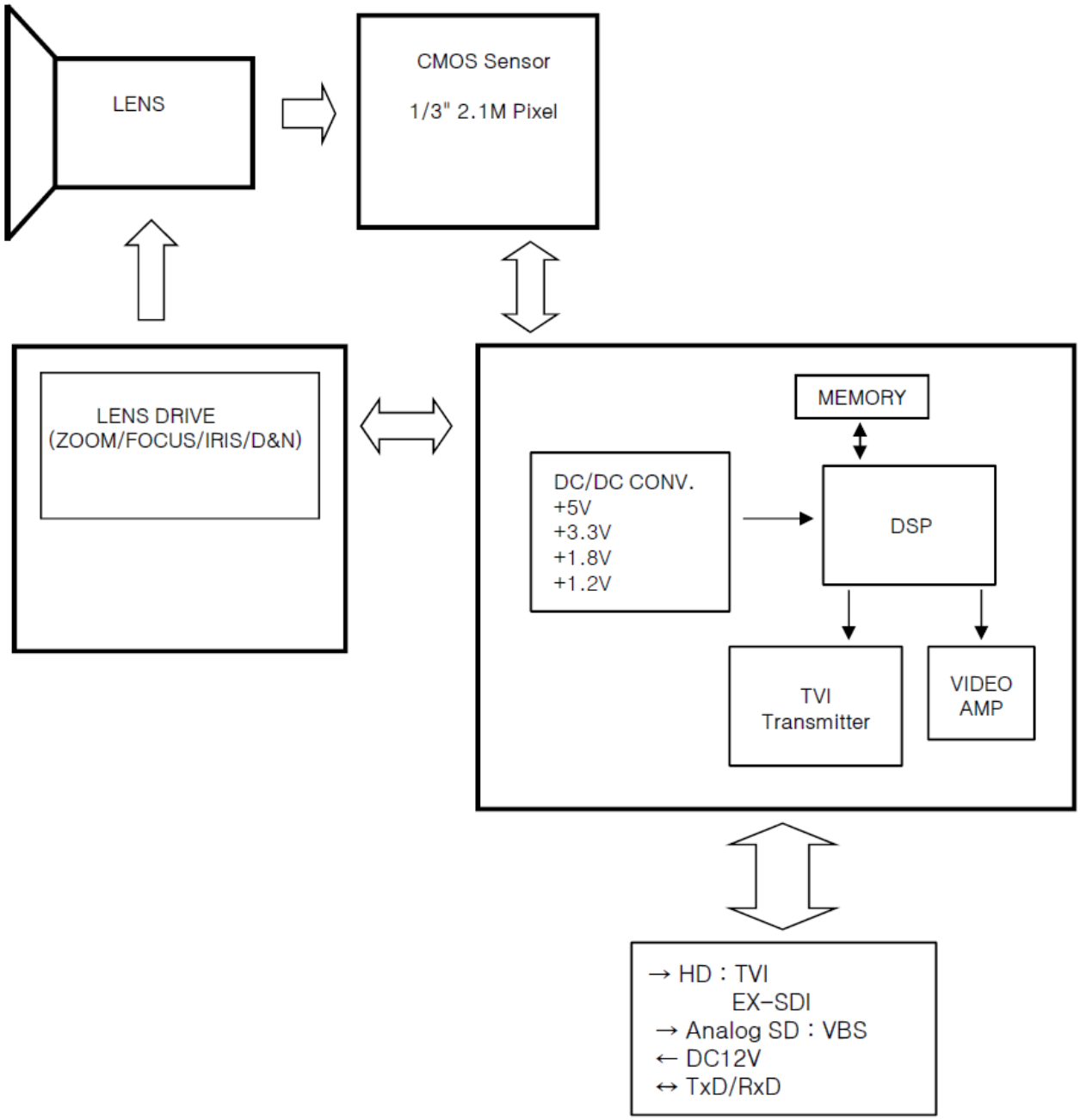
7. F/W_SEL (J204-14)

Select Model type according to application.

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

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

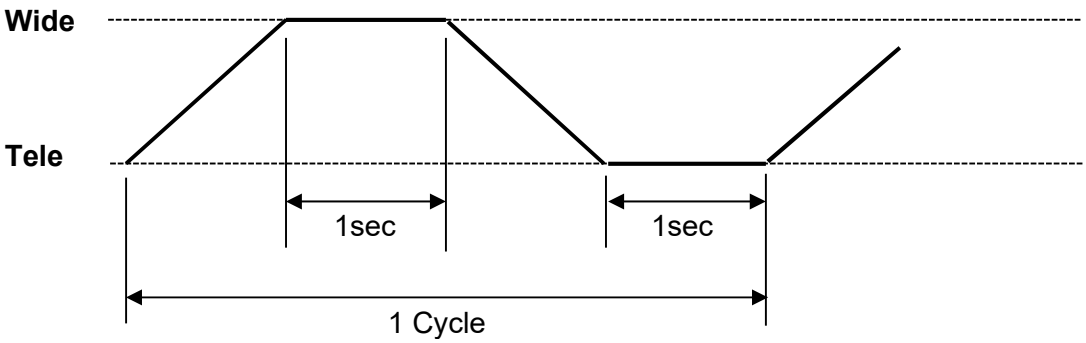
Block Diagram



Reliability

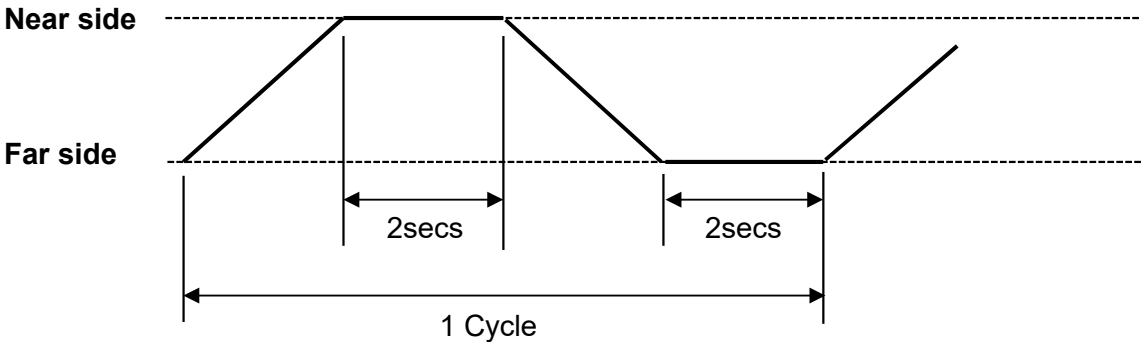
1. Zoom

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



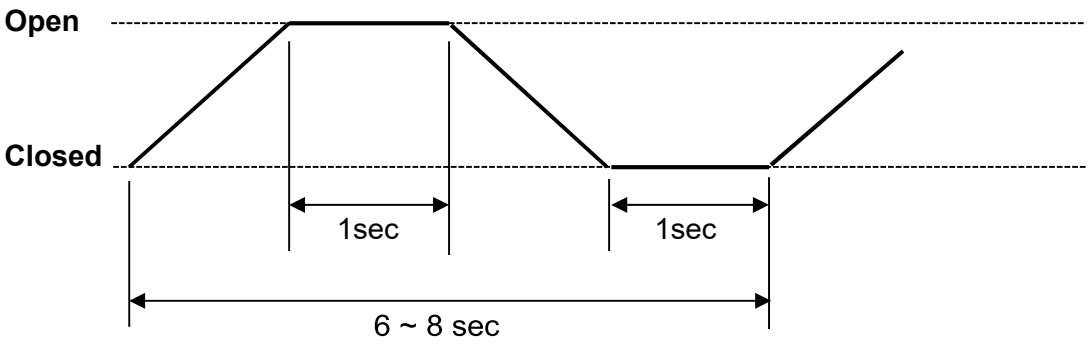
2. Focus

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



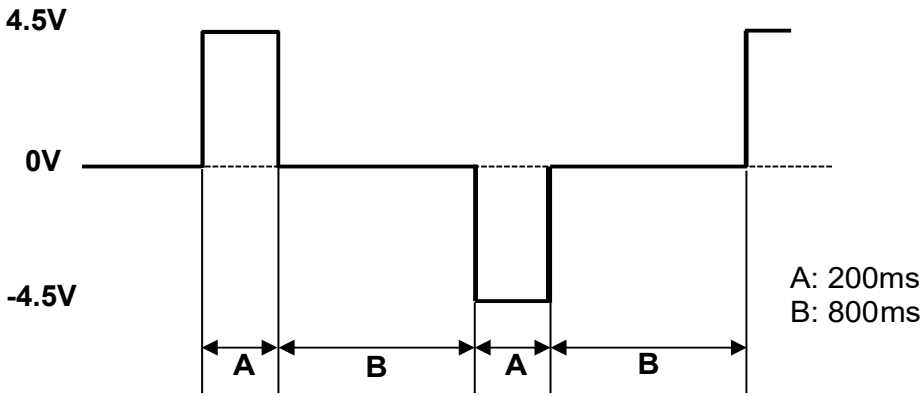
3. Auto-iris

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



4. IRCF

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



Functions

1. Zoom

- Max. zoom ratio
  - Optical Zoom: Max x10
  - Digital Zoom: Max x32
  - Optical + Digital Zoom: Max x320

※ Digital Zoom cannot be used when the motion detection is turned on.

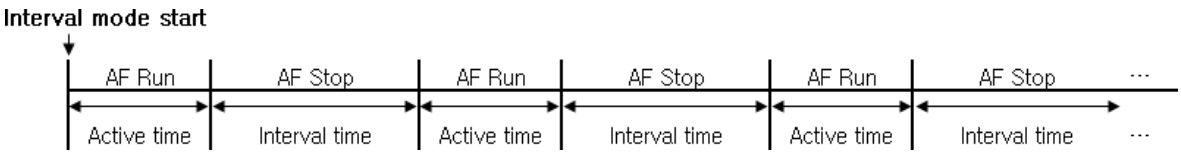
- Digital zoom mode
  - Combined mode:
    After the optical zoom has reached its maximum level, the camera switches to digital zoom mode when zooming in. Likewise, the camera switches back to optical zoom mode after the digital zoom has reached its minimum level when zooming out.

  - Separate mode:
    Optical zoom and digital zoom can be operated separately.

2. Focus

- Auto focus mode
  - Auto Mode:
    Auto Focus automatically adjusts the focus position to maximize the high frequency content of the picture in a center measurement area, taking into consideration the high luminance and strong contrast components. Auto Mode is the normal mode for AF operation.

  - Interval Mode:
    The mode used for Auto Focus movements carried out at particular intervals. The interval time and active time for AF movements and for the timing of the stops can be set.



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

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

  - One push trigger:
    When a Trigger Command is sent, the lens moves to adjust the focus for the subject. The focus lens then holds that position until the next Trigger Command is input.

  - Infinity mode:
    The lens is forcibly moved to a position suitable for an unlimited distance.

- Near Limit (Focus Distance)
  Can be set in minimum range of focus.

3. White balance

- AUTO mode
  This mode computes the white balance value output using color information from the entire screen. It outputs the proper value using the color temperature.

- One push mode
  This is a fixed white balance mode that may be automatically readjusted only at the request of the user (One-push Trigger)

- Manual mode
  Manual control of R and B gain.

- Indoor mode
  3700K base mode

- Outdoor mode
  5100K base mode

4. Auto Exposure

- Exposure mode
  - Auto mode:
    Full Auto with Auto Iris and Shutter Speed. User can turn on/off AGC and Digital Slow Shutter feature.

  - Iris priority mode:
    User can set Iris Level, and shutter speed is set automatically according to the brightness of the subject. User can turn on/off AGC and Digital Slow Shutter.

  - Shutter priority mode:
    User can set variable shutter speed, and Iris is set automatically according to the brightness of the subject. User can turn on/off AGC.

  - Manual mode:
    User can set Iris, Shutter speed and Gain. User can also use Digital Slow Shutter by adjusting the shutter speed.

  - Bright mode (Manual):
    User can set Iris and Gain.

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

- Exposure compensation (Brightness)
  - Function to offset the internal reference brightness level used in the AE mode.

5. WDR (Wide Dynamic Range)

The WDR function ensures that when images are shot with a wide dynamic range, the camera can balance the lighting to have a clear image, without loss in details in darker or lighter parts due to under- or overexposure. This is achieved by combining a multiple number of images, shot at different exposure durations.

※ WDR does not work in Manual Exposure Mode and Shutter Priority Mode.

6. BLC (Back Light Compensation)

The BLC function provides compensation by increasing the brightness of the overall screen so that subjects being shot with a loss of dark detail due to backlight will have just the right brightness level.

※ WDR and BLC cannot be used at the same time.
(When WDR On, BLC is Off. And when BLC is On, WDR is Off)
※ BLC does not work in Manual Exposure Mode.

7. Day&Night (ICR) mode

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

- Auto Mode:
  Automatically switches the settings needed for attaching or removing the IR Cut Filter. With a set level of darkness, the IR Cut Filter is automatically disabled. With a level of brightness, the IR Cut Filter is automatically enabled.
  - IR Detection:
    On systems equipped with an IR light, the internal data of the camera is used to make the proper decisions to avoid malfunctions.

- Ext-In Mode:
  Switches to Day mode when the input from D&N-IN Port is High and switches to Night mode when it is low.

8. DIS (Digital Image Stabilizer)

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

9. Sharpness (Aperture)

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

10. Freeze

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

11. Privacy Mask

- Mask can be set on up to 24 places according to Pan/Tilt positions.
- Individual on/off zone masking settings.
- Two groups from among 14 colors in each group transparency can be individually set for each or 24 privacy zones.
- Interlocking control with zooming.
- Interlocking control with Pan/Tilt. (Interlock mode)
- Parameters in VISCA Command (Privacy related commands in Command List)

- Mask Number (mm):
  Mask A = 00h ~ Mask X = 17h
  ※ Mask A has highest priority and Mask X has lowest priority

- Mask setting bit (pp pp pp pp)

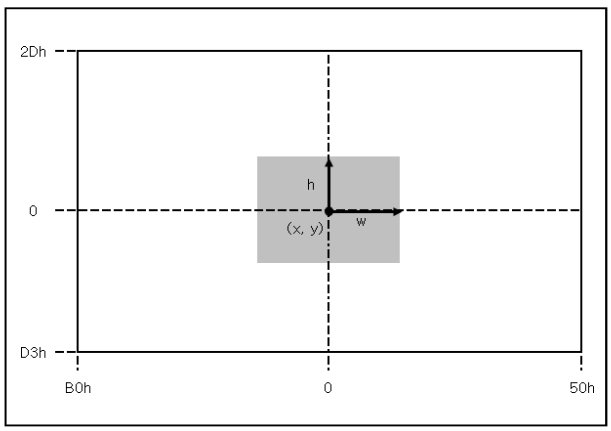
	pp								pp								pp								pp							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Mask#	-	-	X	W	V	U	T	S	-	-	R	Q	P	O	N	M	-	-	L	K	J	I	H	G	-	-	F	E	D	C	B	A

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

- Mask Center Position:
  x (pp) = B0h(-50h) ~ 50h y (qq) = D3h(-2Dh) ~ 2Dh

  ※ Can be set in Non-Interlock mode only.
  Fixed as (0,0) in Interlock mode.

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



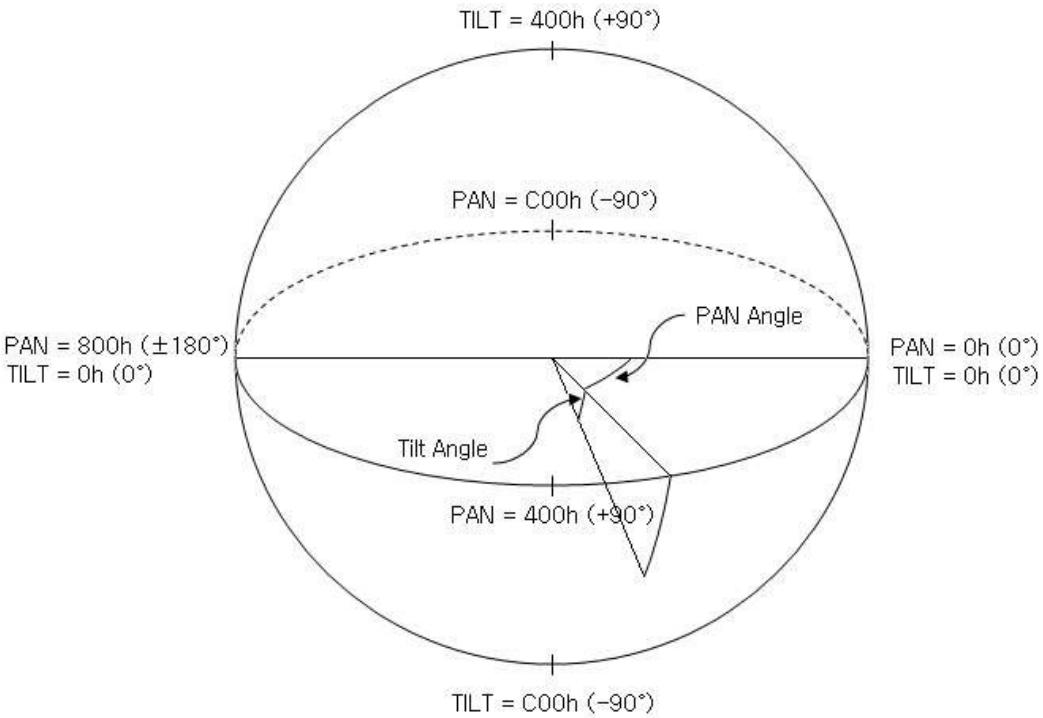
- Mask Color (qq, rr)

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

- Pan/Tilt angle (ppp, qqq):

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

  Angle resolution (360 / 4096)



12. Motion Detection

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

- You can set up to 3 MD Window.
- When the motion is detected in the set frame, the Alarm activates through Alarm ACK and MD-Out port.
- The interval of alarm detection and dwell time can be set up to 255 seconds in units of one second.
  - Interval Time: The MD Alarm isn't activated again till the interval time passed by.
  - Dwell Time: keeps the MD Alarm Signal (MD-Out) and MD Zoom Preset Position during the set dwell time, after the alarm activated.

13. DNR (Digital Noise Reduction)

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

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

14. Mirror

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

15. HLC

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

16. Defog

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

17. Lens Initialize

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

18. Comp Scan

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

※ When you use this function, the lens needs to be blocked to prevent light getting into the lens.

19. Custom Preset

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

20. Defect / Spot pixels

Spot pixels are caused by pixel sensors (on the image sensor) that have an output which does not accurately represent the incident light on the pixel area. This makes the affected pixel look different to the surrounding pixels. Regardless of the manufacturer, all CMOS image sensors have some spot pixels; they are caused by faults in the very small transistors in the pixel sensor. The smaller the transistor is, the more likely it is to have/develop an issue. Damage can be due to manufacturing issues, but often they are caused by particle radiation such as cosmic rays, etc.

Usually, these spot pixels look like pixel size (therefore small) white points seen in a dark image - in a normal scene they can be very difficult to see. Sometimes the damage is minor and the pixel will 'misbehave' to different degrees depending on the temperature, shutter speed (integration time), gain and other factors. This can make the spot pixel flash, or only appear under certain conditions. Unfortunately, with current CMOS image sensor technology it is not possible to prevent these spot pixels, and, over time as the sensor ages and accumulates damage from ambient radiation, the number of spot pixels will increase.

Due to this, manufacturers of standard image sensors do not warranty against spot pixel faults. Instead, they recommend that camera designers take measures to compensate for spot pixels. This involves identifying problem pixels and replacing the pixel output with a value that has been interpolated from the surrounding pixels. However, problem pixels can be difficult to identify accurately. For example, as the temperature of the sensor fluctuates, or the exposure changes, some pixels may fall in and out of line with their expected response. Also, sensors will develop new defects after the initial factory correction has taken place.

Therefore, Harrier cameras are only warrantied against major sensor faults (many pixels across) on first delivery of the camera. To mitigate against this problem, Harrier cameras offer the ability to perform a re-calibration that will eliminate new spot pixels that appear in dark scenes. When using this function, the lens must be completely covered such that no light gets into the lens - this allows the identification of white spot pixels.

- Using the ADKEY feature, or the CAM_MENUKey VISCA commands, open the On Screen Menu and select Special Functions.
- Highlight the DEFECT option and 'Select' it.

The camera will analyze the dark image and identify spot pixels so that they can be compensated for when processing the final image.

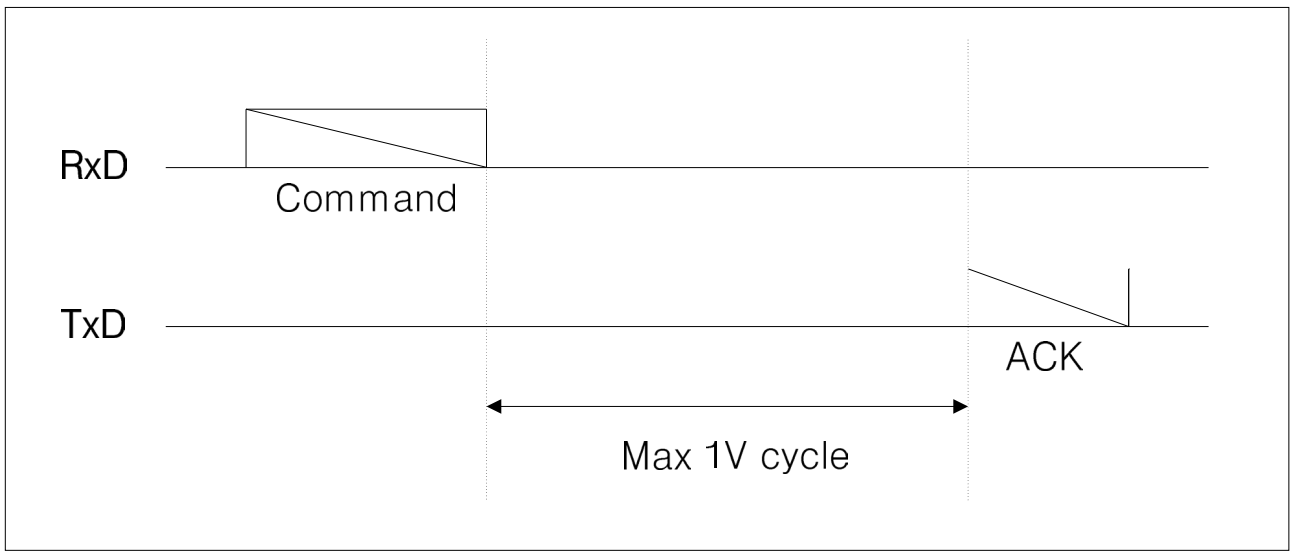
Protocol

1. Timing

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

※ 1V cycle

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



2. Communication parameter

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

3. Pelco-D Protocol Command List

Function	Message format (Hex)						
	Byte 1	Byte 2	Byte 3	Byte4	Byte 5	Byte6	Byte7
Zoom Tele	FF	ID	00	20	00	00	CS
Zoom Wide	FF	ID	00	40	00	00	CS
Focus Near	FF	ID	01	00	00	00	CS
Focus Far	FF	ID	00	80	00	00	CS
Stop	FF	ID	00	00	Don't care		CS
Menu (Set)	FF	ID	00	03 or 07	00	5F	CS
Esc	FF	ID	00	03 or 07	00	60	CS
Up	FF	ID	00	08	00	XX	CS
Down	FF	ID	00	10	00	XX	CS
Left	FF	ID	00	04	XX	00	CS
Right	FF	ID	00	02	XX	00	CS
Set Zoom Preset	FF	ID	00	03	00	Preset ID (01 ~ 05)	CS
Clear Zoom Preset	FF	ID	00	05	00	Preset ID (01 ~ 05)	CS
Go to Zoom Preset	FF	ID	00	07	00	Preset ID (01 ~ 05)	CS
Focus Mode	FF	ID	00	2B	00	00,01:Auto 02: Manual	CS

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

4. Pelco-P Protocol Command List

Function	Message format (Hex)							
	Byte1	Byte 2	Byte 3	Byte4	Byte 5	Byte 6	Byte 7	Byte8
Zoom Tele	A0	ID	00	20	00	00	AF	CS
Zoom Wide	A0	ID	00	40	00	00	AF	CS
Focus Near	A0	ID	02	00	00	00	AF	CS
Focus Far	A0	ID	01	00	00	00	AF	CS
Stop	A0	ID	00	00	Don't care		AF	CS
Menu (Set)	A0	ID	00	03 or 07	00	5F	AF	CS
Esc	A0	ID	00	03 or 07	00	60	AF	CS
Up	A0	ID	00	08	00	XX	AF	CS
Down	A0	ID	00	10	00	XX	AF	CS
Left	A0	ID	00	04	XX	00	AF	CS
Right	A0	ID	00	02	XX	00	AF	CS
Set Zoom Preset	A0	ID	00	03	00	Preset ID (01 ~ 05)	AF	CS
Clear Zoom Preset	A0	ID	00	05	00	Preset ID (01 ~ 05)	AF	CS
Go to Zoom Preset	A0	ID	00	07	00	Preset ID (01 ~ 05)	AF	CS

- ID: Camera ID (1 ~ 255)
- XX: Speed (10h < XX ≤ 40h)
- CS(Check Sum): An XOR sum of byte 1 ~ 7 in the message.

5. VISCA Protocol

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

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

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

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

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

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

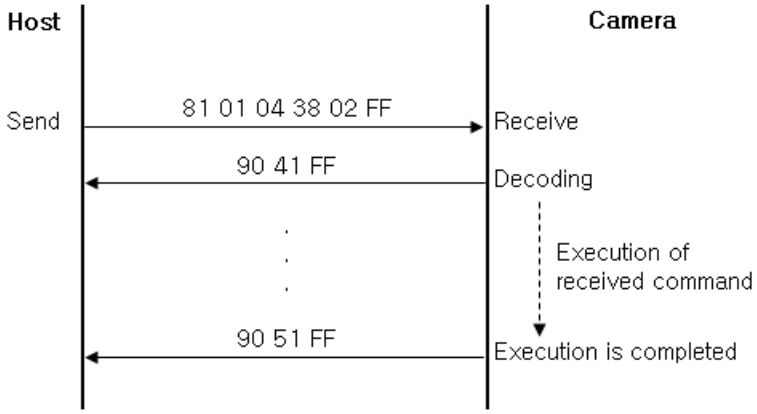
※ When command messages are sent to the camera, it is normal to send the next command message after waiting for the completion message or error message to return. However, to deal with advanced uses, the camera has three buffers (memories) for commands, so that up to three commands including the commands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

Ack type	Reply packet
Receive Ack	Y0 4R FF
Compeletion (Commands)	Y0 5R FF
Compeletion (Inquiries)	Y0 50 … FF
Error	Y0 6R SS FF

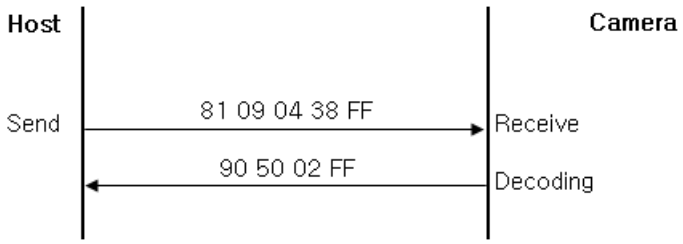
SS	Description
01	Message length error
02	Syntax error
03	Command buffer full
04	Command cancelled
05	No socket (to be cancelled)
41	Command not executable

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

※ Command



※ Inquiry command



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

    Y0 38 FF

    – Y: 9 ~ F (Camera address + 8)

VISCA Command List

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
		8x 01 00 01 FF	
CommandCancel		8x 2p FF	p : Socket No.(1 ~ 3)
CAM_Power	Power Reset	8x 01 04 00 03 FF	Camera Rebooting
CAM_Zoom	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 (Slow) ~ 7 (Fast)
	Wide (Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs : Zoom Position
CAM_ZoomPreset	Set	8x 01 04 67 01 0p FF	p : Zoom Preset Number (0 ~ 4)
	Run	8x 01 04 67 02 0p FF	p : Zoom Preset Number (0 ~ 4)
	Clear	8x 01 04 67 03 0p FF	p : Zoom Preset Number (0 ~ 4, Fh : All)
CAM_DZoom	On	8x 01 04 06 02 FF	Digital Zoom ON/OFF
	Off	8x 01 04 06 03 FF	
	Combine Mode	8x 01 04 36 00 FF	Optical/Digital Zoom Combined
	Separate Mode	8x 01 04 36 01 FF	Optical/Digital Zoom Separated
	Stop	8x 01 04 06 00 FF	
	Tele (Variable)	8x 01 04 06 2p FF	p : 0(Slow) ~ 7(Fast) * Effective separate mode
	Wide (Variable)	8x 01 04 06 3p FF	
	x1/Max	8x 01 04 06 10 FF	x1/Max Magnification switchover * Effective separate mode
	Direct	8x 01 04 46 00 00 0p 0q FF	pq : D-Zoom Position * Effective separate mode
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far (Standard)	8x 01 04 08 02 FF	
	Near (Standard)	8x 01 04 08 03 FF	
	Far (Variable)	8x 01 04 08 2p FF	p : 0(Slow) ~ 7(Fast)
	Near (Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs : Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF ON/OFF
	Manual Focus	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One Push AF Trigger
	Infinity	8x 01 04 18 02 FF	Forced Infinity
	Near Limit	8x 01 04 28 0p 0q 0r 0s FF	pqrs : Focus Near Limit Position
CAM_AF Mode	Normal AF	8x 01 04 57 00 FF	Normal AF Mode
	Interval AF	8x 01 04 57 01 FF	Interval AF Mode
	Zoom Trigger AF	8x 01 04 57 02 FF	Zoom Trigger Mode
	Active/Interval Time	8x 01 04 27 0p 0q 0r 0s FF	pq : Active Time(1~255), rs : Interval Time(1~255)
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs : Zoom Position tuvw : Focus Position

Command Set	Command	Command Packet	Comments
CAM_Initialize	Lens	8x 01 04 19 01 FF	Lens Soft Reset
	Comp Scan	8x 01 04 19 02 FF	Execute White spot compensation
	Comp Scan Thrs	8x 01 04 19 03 00 0p 0q FF	pq : Threshold of White spot compensation
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor Mode
	Outdoor	8x 01 04 35 02 FF	Outdoor Mode
	One Push AWB	8x 01 04 35 03 FF	One Push AWB Mode
	Manual	8x 01 04 35 05 FF	Manual Control Mode
	One Push Trigger	8x 01 04 10 05 FF	One Push AWB trigger
CAM_RGain	Reset	8x 01 04 03 00 FF	Red Gain Manual setting
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq : R Gain(0~14h)
CAM_BGain	Reset	8x 01 04 04 00 FF	Blue Gain Manual setting
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq : B Gain(0~14h)
CAM_Chroma	Direct	8x 01 04 13 00 00 0p 0q FF	pq : Chroma level (0~14h)
CAM_AE	Full Auto	8x 01 04 39 00 FF	Auto exposure mode
	Manual	8x 01 04 39 03 FF	Manual control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter priority auto exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris priority auto exposure mode
	Bright	8x 01 04 39 0D FF	Bright Mode (Manual control)
CAM_SlowShutter	Auto (On)	8x 01 04 5A 02 FF	Auto Slow Shutter ON/OFF
	Manual (Off)	8x 01 04 5A 03 FF	
CAM_MaxDSSLev	Direct	8x 01 04 5A 1p FF	p :Max Slow shutter level (0:x2, 1:x4, 2:x8) ※ You can't select “x8” in 30 or 25 fps mode
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq : Shutter Position
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq : Iris Position
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 00 00 0p 0q FF	pq : Gain Position (0 ~ Ah)

Command	Command Setting	Command Packet	Comments
CAM_AGC	On	8x 01 04 5C 02 FF	AGC Mode
	Off	8x 01 04 5C 03 FF	
CAM_Bright	Reset	8x 01 04 0D 00 FF	Brightness 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: Brightness Position
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation amount setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position (0 ~ 14h)
CAM_Flickerless	On	8x 01 04 7A 02 FF	Flickerless ON/OFF
	Off	8x 01 04 7A 03 FF	
CAM_BLC	On	8x 01 04 33 02 FF	Back Light Compensation
	Off	8x 01 04 33 03 FF	
CAM_BLCFunc	Area OSD Display	8x 01 04 3C 0p FF	p: 0(Area OSD Off), 1(Area OSD On)
	Area Start X	8x 01 04 3C 10 00 0p 0q FF	pq: Start Horizontal Position (0 ~ 36h)
	Area Start Y	8x 01 04 3C 20 00 0p 0q FF	pq: Start Vertical Position (0 ~ 3Ch)
	Area End X	8x 01 04 3C 30 00 0p 0q FF	pq: End Horizontal Position (4~3Ah)
	Area End Y	8x 01 04 3C 40 00 0p 0q FF	pq: End Vertical Position (4~40h)
CAM_HLC	Mode	8x 01 04 32 0p FF	p: HLC Mode - 0(Off), 1(On), 2(Night Only)
	Level	8x 01 04 32 10 00 0p 0q FF	pq: HLC Level (0~14h)
	Clip Color	8x 01 04 32 3p FF	p: HLC Color - 0 ~ Dh (0:BLK, 1~6:Gray, 7:WHT, 8:RED, 9:GRN, Ah:BLU, Bh:CYN, Ch:YEL, Dh:MAG)
CAM_WD	On	8x 01 04 3D 02 FF	Wide-Dynamic Range ON/OFF
	Off	8x 01 04 3D 03 FF	
CAM_WD_Level	Direct	8x 01 04 7D 0p FF	p: WDR Level (0 ~ 4)
CAM_ACE	On	8x 01 04 1A 02 FF	ACE (Adaptive Contrast Enhancement) ON/OFF
	Off	8x 01 04 1A 03 FF	
CAM_ACELevel	Direct	8x 01 04 1A 10 0p FF	p: ACE Level (0 ~ 2)
CAM_Defog	On	8x 01 04 65 02 FF	Defog ON/OFF
	Off	8x 01 04 65 03 FF	
	Level	8x 01 04 65 10 0p FF	p: Defog Level (0 ~ 2)
	Mode	8x 01 04 65 20 0p FF	p: 0(Manual), 1(Auto)
CAM_DNR	Mode	8x 01 04 53 0p FF	p: 0 (Off), 1 ~ 3 (Manual Level), 4 (Auto)
CAM_GAMMA	Direct	8x 01 04 5B 0p FF	p: Gamma setting (0:0.45, 1:0.55, 2:0.65, 3:0.75)
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain (0~Ah)

Command	Command Setting	Command Packet	Comments
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Mirror Image ON/OFF
	Off	8x 01 04 61 03 FF	
CAM_Freeze	On	8x 01 04 62 02 FF	Freeze Picture ON/OFF
	Off	8x 01 04 62 03 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Picture Reverse On/Off (Rotate 180 °)
	Off	8x 01 04 66 03 FF	
CAM_ICR	Night	8x 01 04 01 02 FF	ICR Mode ON/OFF
	Day	8x 01 04 01 03 FF	
	Auto	8x 01 04 51 02 FF	ICR is changed automatically by AGC Gain
	Ext-In	8x 01 04 51 05 FF	ICR is changed by external input
	Threshold	8x 01 04 21 00 00 0p 0q FF	pq: Threshold level of Auto mode (0 ~ 1Ch)
	Gap	8x 01 04 21 10 00 00 0p FF	pq: On/Off Threshold Gap of Auto mode (0 ~ 4)
	Auto ICR Delay	8x 01 04 41 00 00 0p 0q FF	pq: Auto mode delay - 0(0sec) ~ FFh(255sec)
	Ext-In Delay	8x 01 04 71 00 00 0p 0q FF	pq: Ext-In mode delay - 0 (0sec) ~ FFh (255sec)
	Burst On	8x 01 04 72 02 FF	Burst On/Off
	Burst Off	8x 01 04 72 03 FF	
	IR Detection On	8x 01 04 6E 02 FF	IR Detection On/Off
	IR Detection Off	8x 01 04 6E 03 FF	
	IR Detection Level	8x 01 04 6E 10 0p FF	p: IR Detection Threshold Level (0 ~ 4h)
CAM_Stabilizer	On	8x 01 04 34 02 FF	Stabilizer ON/OFF/HOLD
	Off	8x 01 04 34 03 FF	
	Hold	8x 01 04 34 00 FF	
CAM_StabilizerFunc	Range	8x 01 04 54 00 0p FF	p: DIS Dzoom Range (0:10%, 1:20%, 2:30%)
	Filter	8x 01 04 54 10 0p FF	p: DIS Filter (0:Low, 1:Middle, 2:High)
	Auto Center	8x 01 04 54 20 0p FF	p: Auto centering mode (0:OFF, 1:Half, 2:Full)
CAM_MEMORY	Reset	8x 01 04 3F 00 0p FF	p: Memory number (0 ~ 9)
	Set	8x 01 04 3F 01 0p FF	
	Recall	8x 01 04 3F 02 0p FF	
CAM_CUSTOM	Reset	8x 01 04 3F 00 7F FF	Starts in this mode at Power On
	Set	8x 01 04 3F 01 7F FF	
	Recall	8x 01 04 3F 02 7F FF	
CAM_MemSave	Write	8x 01 04 23 0t 0p 0q 0r 0s FF	t: 00 ~ 07 (Address) Total 16Byte pqrs: 0000 ~ FFFFh (Data)
CAM_Display	On	8x 01 04 15 02 FF	Display ON/OFF
	Off	8x 01 04 15 03 FF	
	On/Off	8x 01 04 15 10 FF	
CAM_DispSel		8x 01 04 14 00 0p FF	Display Item On(1)/Off(0) p: bit[0] - ID, bit[1] - Title, bit[2] - Zoom Position bit[3] - System Message

Command	Command Setting	Command Packet	Comments
CAM_MultiLineTitle	Title Set1	8x 01 04 73 1L 00 nn 00 qq rr 00 00 00 00 00 FF	L: Line Number (0 ~ Eh), nn: H-Position (0 ~ 27h), qq: Blink, rr: Opening Title
	Title Set2	x 01 04 73 2L mm nn pp qq rr ss tt uu vv ww FF	L: Line Number (0 ~ Eh) mnpqrstuvw: Set of characters (1 ~ 10)
	Title Set3	x 01 04 73 3L mm nn pp qq rr ss tt uu vv ww FF	L: Line Number (0 ~ Eh) mnpqrstuvw: Set of characters (11~ 20)
	Title Clear	8x 01 04 74 1p FF	Title Set clear (p: 0 ~ Eh, Fh= all line)
	On	8x 01 04 74 2p FF	Title display On/Off (0 ~ Eh, Fh= all line)
	Off	8x 01 04 74 3p FF	
CAM_MENUKey	Up	8x 01 04 16 01 FF	
	Down	8x 01 04 16 02 FF	
	Left	8x 01 04 16 04 FF	
	Right	8x 01 04 16 08 FF	
	Menu	8x 01 04 16 10 FF	
	ESC	8x 01 04 16 20 FF	
CAM_User OSD	Display String	8x 01 05 10 xx yy cc ss "nnnnnnnnnnnn" FF	xx: X position (0 ~ 27h) yy: Y Position (0 ~ Eh) cc: Color (Fixed, 07: White) ss: NORMAL = 00 INVERSE = 01 BLINK = 02 "nnnnn….": Display String (Max 26 char)
	Blue Screen	8x 01 05 20 0p FF	p: Blue Screen Display - 0(Off), 1(On)
	Screen Clear	8x 01 05 30 01 FF	Screen All clear
CAM_Mute	On	8x 01 04 75 02 FF	Mute ON/OFF
	Off	8x 01 04 75 03 FF	
	On/Off	8x 01 04 75 10 FF	
CAM_PrivacyZone	SetMask	8x 01 04 76 mm nn 0r 0r 0s 0s FF	mm: MaskSettings nn: 00=Modify, 01=New rr: W, ss: H
	Display	8x 01 04 77 pp pp pp pp FF	Mask Display On/Off pppppppp: MaskSettings (0: OFF, 1: ON)
	SetMaskColor	8x 01 04 78 pp pp pp pp qq rr FF	pppppppp: Mask Color Settings qq: Color Setting when 0 is selected rr: Color Setting when 1 is selected
	SetPanTiltAngle	8x 01 04 79 0p 0p 0p 0q 0q 0q FF	Pan/Tilt Angle Settings ppp: Pan, qqq: Tilt
	SetPTZMask	8x 01 04 7B mm 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	Pan/Tilt/Zoom Settings for Mask mm: Mask Settings ppp: Pan, qqq: Tilt, rrrr: Zoom
	Non_InterlockMask	8x 01 04 6F mm 0p 0p 0q 0q 0r 0r 0s 0s FF	mm: Non-Interlock Mask Settings pp: X, qq: Y, rr: W, ss: H

Command	Command Setting	Command Packet	Comments
CAM_KeyLock	Off	8x 01 04 17 00 FF	Key Lock ON/OFF
	On	8x 01 04 17 02 FF	
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID（0000 ~ FFFFh)
CAM_MD	On	8x 01 04 1B 02 FF	Motion Detection On/Off
	Off	8x 01 04 1B 03 FF	
	Function Set	8x 01 04 1C 0m 0n 0p 0q 0r 0s FF	m: Display mode n: Detection Frame Set (bit[0]:1, bit[1]:2, bit[3]:3) pq: Threshold Level (00 ~ 14h) rs: Interval Time set (00 ~ FFh)
	Window Set	8x 01 04 1D 0m 0p 0q 0r 0s FF	m: Select Detection Frame Number (0,1,2) p: Start Horizontal Position（00 ~ 0Eh) q: Start Vertical Position (00 ~ 07) r: End Horizontal Position (01 ~ 0Fh) s: End Vertical Position (01 ~ 08h)
	MD Zoom Preset	8x 01 04 1E 02 FF	MD Zoom Preset On
		8x 01 04 1E 03 FF	MD Zoom Preset Off
	Set MD Zoom Pos	8x 01 04 1E 10 FF	Set MD Zoom preset to current zoom position
	Alarm (Reply)	y0 07 04 1B 0p FF	p: Detection Frame Set
CAM_Continuous ZoomPosReply	On	8x 01 04 69 02 FF	Zoom Position data continues output On/Off
	Off	8x 01 04 69 03 FF	
	(Reply)	y0 07 04 69 0p 0p 0q 0q 0q 0q FF	pp: D-Zoom Position * 00: When D-Zoom Mode is Combine qqqq: Zoom Position
CAM_Reply IntervalTimeSet		8x 01 04 6A 00 00 0p 0q FF	pq: Interval Time [Vertical timing]
CAM_RegisterValue		8x 01 04 24 mm 0p 0q FF	mm: Register No. (00, 52h, 60h, 72h, 73h, 90h, 91h, 9Ah, 9Bh) pq: Register Value

VISCA Inquiry Command List

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_ZoomPresetInq	8x 09 04 67 FF	Y0 50 00 00 0p 0q FF	pq: bit[0]:0 ~ bit[4]:4, (1:Set, 0:Unset)
CAM_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
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_AFStateInq	8x 09 04 26 FF	y0 50 0p FF	p: AF State - 0(Stop), 1(Run)
CAM_AFTimeSettingInq	8x 09 04 27 FF	y0 50 0p 0q 0r 0s FF	pq: Active Time, rs: Interval Time
CAM_CompScanThrsInq	8x 09 04 19 03 FF	y0 50 00 00 0p 0q FF	pq: White spot compensation Threshold
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	Indoor
		y0 50 02 FF	Outdoor
		y0 50 03 FF	One Push AWB
		y0 50 05 FF	Manual
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain (0~14h)
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain (0~14h)
CAM_ChromaInq	8x 09 04 13 FF	y0 50 00 00 0p 0q FF	pq: Chroma level (0~14h)
CAM_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	Off
CAM_MaxDSSLevInq	8x 09 04 5A 10 FF	y0 50 0p FF	p:Max Slow shutter level (0:x2, 1:x4, 2:x8) ※ You can't select “x8” in 30 or 25 fps mode
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_GainPosInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position
CAM_AGCModeInq	8x 09 04 5C FF	y0 50 02 FF	On
		y0 50 03 FF	Off

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_BrightPosInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_FlickerlessInq	8x 09 04 7A FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_BackLightModeInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_BLCAreaInq	8x 09 04 3C 00 FF	y0 50 0p FF	p: 0(Area OSD Off), 1(Area OSD On)
CAM_BLC_StartXInq	8x 09 04 3C 10 FF	y0 50 00 00 0p 0q FF	pq: Start Horizontal Position (0 ~ 36h)
CAM_BLC_StartYInq	8x 09 04 3C 20 FF	y0 50 00 00 0p 0q FF	pq: Start Vertical Position (0 ~ 3Ch)
CAM_BLC_EndXInq	8x 09 04 3C 30 FF	y0 50 00 00 0p 0q FF	pq: End Horizontal Position (4~3Ah)
CAM_BLC_EndYInq	8x 09 04 3C 40 FF	y0 50 00 00 0p 0q FF	pq: End Vertical Position (4~40h)
CAM_HLCModeInq	8x 09 04 32 00 FF	y0 50 0p FF	p: HLC Mode - 0(Off), 1(On), 2(Night)
CAM_HLCLevelInq	8x 09 04 32 10 FF	y0 50 00 00 0p 0q FF	pq: HLC Level (0 ~ 14h)
CAM_HLCColorInq	8x 09 04 32 30 FF	y0 50 0p FF	p: HLC Color - 0 ~ Dh (0:BLK, 1~6:Gray1~6, 7:WHT, 8:RED, 9:GRN, Ah:BLU, Bh:CYN, Ch:YEL, Dh:MAG)
CAM_WDModeInq	8x 09 04 3D FF	y0 50 02 FF	WDR On
		y0 50 03 FF	WDR Off
CAM_WDLevelInq	8x 09 04 7D FF	y0 50 0p FF	p: WDR Level (0 ~ 4)
CAM_ACEInq	8x 09 04 1A FF	y0 50 02 FF	Adaptive Contrast Enhancement On
		y0 50 03 FF	Adaptive Contrast Enhancement Off
CAM_ACELevelInq	8x 09 04 1A 10 FF	y0 50 0p FF	p: ACE Level (0 ~ 2)
CAM_DefogInq	8x 09 04 65 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_DefogLevelInq	8x 09 04 65 10 FF	y0 50 0p FF	p: Defog Level (0 ~ 2)
CAM_DefogModeInq	8x 09 04 65 20 FF	y0 50 0p FF	p: Defog Mode - 0(Manual), 1(Auto)
CAM_DNRModeInq	8x 09 04 53 FF	y0 50 0p FF	p: 0 (Off), 1 ~ 3 (Manual Level), 4 (Auto)
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	p: Gamma setting (0:0.45, 1:0.55, 2:0.65, 3:0.75)
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain (0 ~ Ah)
CAM_LR_ReverseModeInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_FreezeModeInq	8x 09 04 62 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureFlipModeInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ICRStateInq	8x 09 04 01 FF	y0 50 02 FF	Night
		y0 50 03 FF	Day

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_ICRModeInq	8x 09 04 51 FF	y0 50 02 FF	Night
		y0 50 03 FF	Day
		y0 50 04 FF	ICR is changed automatically by AGC Gain
		y0 50 06 FF	ICR is changed by external input
CAM_ICRThresholdInq	8x 09 04 21 FF	y0 50 00 00 0p 0q FF	pq: Threshold level of Auto Mode (0 ~ 1Ch)
CAM_ICRGapInq	8x 09 04 21 10 FF	y0 50 0p FF	p: On/Off Threshold Gap of Auto mode(0 ~ 4)
CAM_AutoICRDelayInq	8x 09 04 41 FF	y0 50 00 00 0p 0q FF	pq: Auto mode delay - 0(0sec)~FFh(255sec)
CAM_Ext-InICRDelayInq	8x 09 04 71 FF	y0 50 00 00 0p 0q FF	pq: Ext-In mode delay - 0(0sec)~FFh(255sec)
CAM_BurstInq	8x 09 04 72 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_IRDetectionInq	8x 09 04 6E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_IRDetectionLevelInq	8x 09 04 6E 10 FF	y0 50 0p FF	p: IR Detection Threshold Level (0 ~ 4)
CAM_AutoICRAlarmReplyInq	8x 09 04 31 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_StabilizerModeInq	8x 09 04 34 FF	y0 05 02 FF	On
		y0 05 03 FF	Off
		y0 05 00 FF	Hold
CAM_StabilizerRangeInq	8x 09 04 54 00 FF	y0 50 0p FF	p: DIS Dzoom Range (0:10%, 1:20%, 2:30%)
CAM_StabilizerFilterInq	8x 09 04 54 10 FF	y0 50 0p FF	p: DIS Filter (0:Low, 1:Middle, 2:High)
CAM_StabilizerAutoCInq	8x 09 04 54 20 FF	y0 50 0p FF	p: Auto centering mode (0:OFF, 1:Half, 2:Full)
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Last Recall Memory No.
CAM_MemSaveInq	8x 09 04 23 0t FF	y0 50 0p 0q 0r 0s FF	t: 0 ~ 7 (Address) pqrs: 0000 ~ FFFFh (Data)
CAM_DisplayInq	8x 09 04 15 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_DispSelInq	8x 09 04 14 00 FF	y0 50 0p FF	Display Item On(1)/Off(0) p: bit[0] - ID, bit[1] - Title, bit[2] - Zoom Position bit[3] - System Message
CAM_TitleDisplayModeInq	8x 09 04 74 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_MenuModeInq	8x 09 04 16 FF	y0 50 02 FF	OSD menu On
		y0 50 03 FF	OSD menu Off
CAM_BlueScreenModeInq	8x 09 05 20 FF	y0 50 0p FF	p: Blue Screen Display - 0(Off), 1(On)
CAM_MuteModeInq	8x 09 04 75 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PrivacyPosInq	8x 09 04 76 mm FF	y0 50 0n 0p 0p 0r 0r 0s 0s FF	mm: Mask Number n: 0(Non-interlock Mode), 1(Interlock Mode) pp: X, qq: Y, rr: W, ss: H
CAM_PrivacyDisplayInq	8x 09 04 77 FF	y0 50 pp pp pp pp FF	pppppppp: Mask Display (0: OFF, 1: ON)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PrivacyColorInq	8x 09 04 78 FF	y0 50 pp pp pp pp qq rr FF	ppppppppp: Mask Color Setting qq: Color Setting when 0 is selected Rr: Color Setting when 1 is selected
CAM_PrivacyPanTiltInq	8x 09 04 79 FF	y0 50 0p 0p 0p 0q 0q 0q FF	ppp: Pan, qqq: Tilt
CAM_PrivacyPTZInq	8x 09 04 7B mm FF	y0 50 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	mm: Mask Settings ppp: Pan, qqq: Tilt, rrrr: Zoom
CAM_PrivacyMonitorInq	8x 09 04 6F FF	y0 50 pp pp pp pp FF	ppppppppp: Mask is displayed now
CAM_KeyLockInq	8x 09 04 17 FF	y0 50 02 FF	On
		y0 50 00 FF	Off
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
CAM_VersionInq	8x 09 00 02 FF	y0 50 00 20 mn pq rs tu vw FF	mnpq: Model Code (0466h) rstu: ROM version (0100h) vw: Socket Number (3)
CAM_ModelInq	8x 09 00 37 FF	y0 50 pp pp pp qq qq FF	pppppp: Model Code *Module Type: YY5E5Ah *Box Type: YY5E58h (YY: Custom. Code, standard model = 00) qqqq: Version
CAM_MDModeInq	8x 09 04 1B FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_MDFunctionInq	8x 09 04 1C FF	y0 50 0m 0n 0p 0q 0r 0s FF	m: Display mode n: Detection Frame Set (bit[0]:1, bit[1]:2, bit[3]:3) pq: Threshold Level (00 ~ 14h) rs: Interval Time set (00 ~ FFh)
CAM_MDWindowInq	8x 09 04 1D 0m FF	y0 50 0p 0q 0r 0s FF	m: Select Detection Frame Number (0,1,2) p: Start Horizontal Position (00 ~ 0Eh) q: Start Vertical Position (00 ~ 07) r: Stop Horizontal Position (01 ~ 0Fh) s: Stop Vertical Position (01 ~ 08h)
CAM_MDZoomPresetInq	8x 09 04 1E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ContinuousZoomPos ReplyModeInq	8x 09 04 69 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ReplyIntervalTimeInq	8x 09 04 6A FF	y0 50 00 00 0p 0p FF	pp: Interval Time
CAM_RegisterValueInq	8x 09 04 24 mm FF	y0 50 0p 0p FF	mm: Register No. (00, 52h, 60h, 72h, 73h, 90h, 91h, 9Ah, 9Bh) pp: Register Value

Exposure Control Values

Shutter Speed (Hex)

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

Bright (Hex)

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

Iris (Hex)

Value	Iris
11	F1.7
10	F2.3
0F	F2.6
0E	F3.1
0D	F3.4
0C	F3.8
0B	F4.4
0A	F5.2
09	F6.6
08	F8.6
07	F11.3
06	(F11.3~CLOSE)*2/3
05	(F11.3~CLOSE)*1/3
00	Closed

Gain (Hex)

Value (Hex)	dB	Value (Hex)	dB
A	37.50	5	18.75
9	33.75	4	15.00
8	30.00	3	11.25
7	26.25	2	7.50
6	22.50	1	3.75
5	18.75	0	0.00

Zoom & Focus Control Values

Optical Zoom

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

Focus Near Limit

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

D-Zoom: Combined Mode

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

D-Zoom: Separate Mode

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

OSD character values

V position	00 ~ 0Eh	15 Rows
H position	00 ~ 27h	40 Columns

Character code:

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

Register Settings

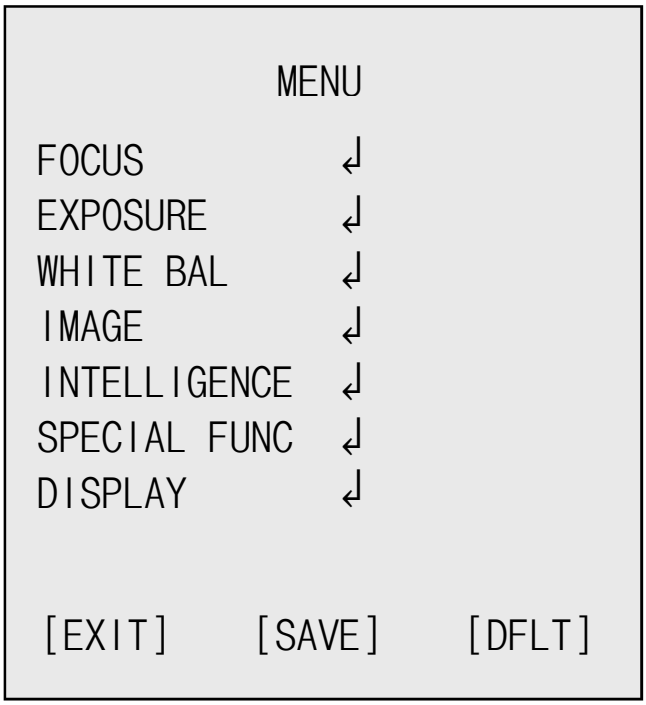
Function	Register No.	Register Value	Setting
BaudRate	00	10	2400 bps
		11	4800 bps
		00	9600 bps
		01	19200 bps
		02	38400 bps
		03	57600 bps
		04	115200 bps
E.ZOOM Max	52	00 ~ F8	Max. DZoom Ratio = 256 / (256 - Value)
Language	60	00	English
		01	Japanese
		03	Simplified Chinese
		05	Traditional Chinese
Monitoring Mode	72	06	1080p/30fps
		08	1080p/25fps
		09	720p/60fps
		0C	720p/50fps
		0E	720p/30fps
		11	720p/25fps
		13	1080p/60fps
		14	1080p/50fps
Output Enabling	73	02	Analog output disabled
		03	Analog output enabled
		04	Analog output auto detection
Image range mode	90	0	Full mode
		1	Comp mode
		2	User mode
Image range custom level	91	0 ~ 20	
EX-SDI mode (* Module type only)	9A	0	Off
		1	On
HD-TVI mode (* Module type only)	9B	0	Off
		1	On

Other Control Values

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

OSD Menu

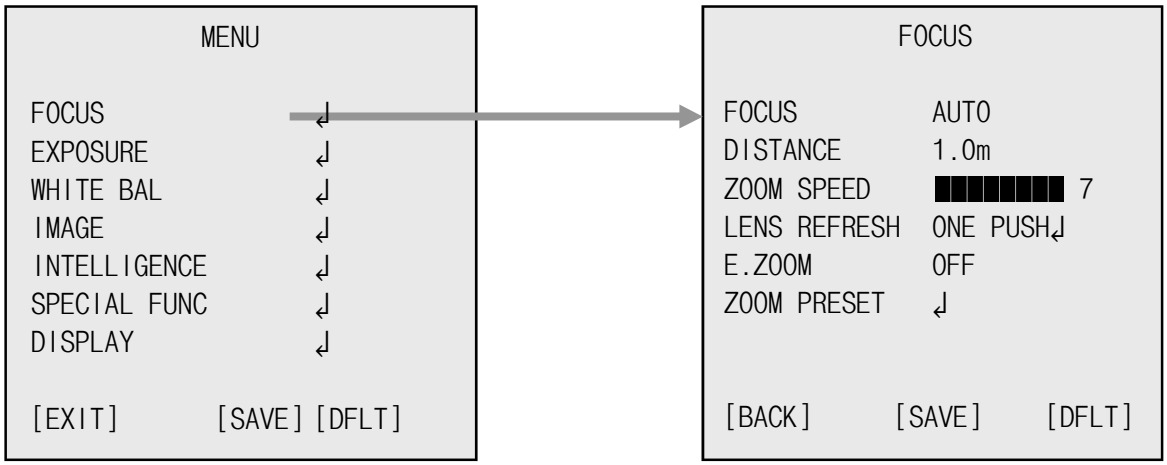
◆ Main Menu



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

If you want to save the menu, select [SAVE].
If you don’t want to save the menu, select [EXIT] (After select, Power off -> on) If you want default the menu, select [DFLT]

◆ FOCUS



◈ FOCUS: Select auto focus mode

▶ AUTO, ONE PUSH, MANUAL

◈ DISTANCE: Select minimum distance in focus between camera and object.

▶ 0.1 / 1.0 / 3.0 / 5.0 / 10.0 m

◈ ZOOM SPEED: Select Zoom Speed

▶ 0 (Slow) ~ 7 (Fast)

◈ LENS REFRESH: Lens origin calibrated automatically.

▶ ONE PUSH↲ / ON (1 day ~ 10 days)

◈ E.ZOOM: Select maximum digital zoom magnification.

▶ OFF / ON (max x2 ~ x19, x21, x23, x25, x28, x32)

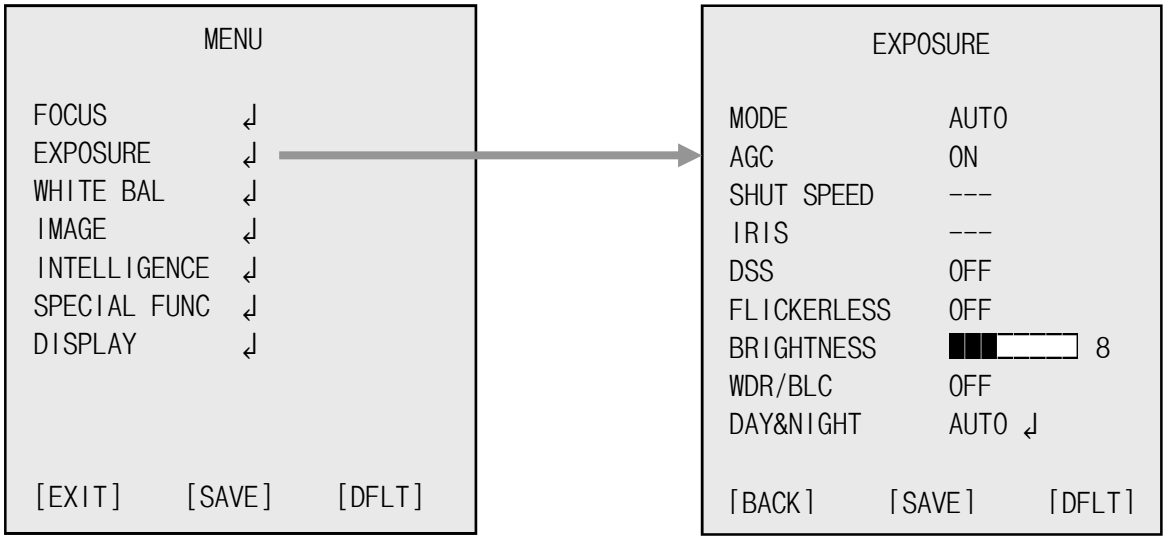
◈ ZOOM PRESET: Select zoom preset

▶ PRESET #: Select Zoom preset number (1 ~ 5)

▶ MODE: OFF / ON↲

▷ ON↲: Adjust the Zoom Position

◆ EXPOSURE



◈ MODE: Select Exposure Mode

▶ AUTO / IRIS.P / SHUT.P / MANUAL

◈ AGC: Select Auto Gain Control

▶ OFF / ON (AUTO, SHUT.P or IRIS.P Mode)
▶ 0 ~ 10 (MANUAL Mode)

◈ SHUT SPEED: Can be set in SHUT.P or MANUAL mode

* 60 / 50 fps mode

▶ x8, x4, x2, 1/60(50), 1/120(100), 1/250, 1/700, 1/1000, 1/1600, 1/2500, 1/5000, 1/7000, 1/10000, 1/30000 sec

* 30 / 25 fps mode

▶ x4, x2, 1/30(25), 1/60(50), 1/120(100), 1/250, 1/700, 1/1000, 1/1600, 1/2500, 1/5000, 1/7000, 1/10000, 1/30000 sec

◈ IRIS: Iris level can be set in IRIS.P or MANUAL mode

▶ 0 ~ 20

◈ DSS: Select maximum DSS (Digital Slow Shutter)

* 60 / 50 fps mode

▶ OFF / x2, x4, x8

* 30 / 25 fps mode

▶ OFF / x2, x4

◈ FLICKERLESS: Select flickerless mode
▶ OFF / ON (remove screen flicker)

◈ BRIGHTNESS: Adjust brightness level
▶ 0(dark) ~ 20(bright) steps

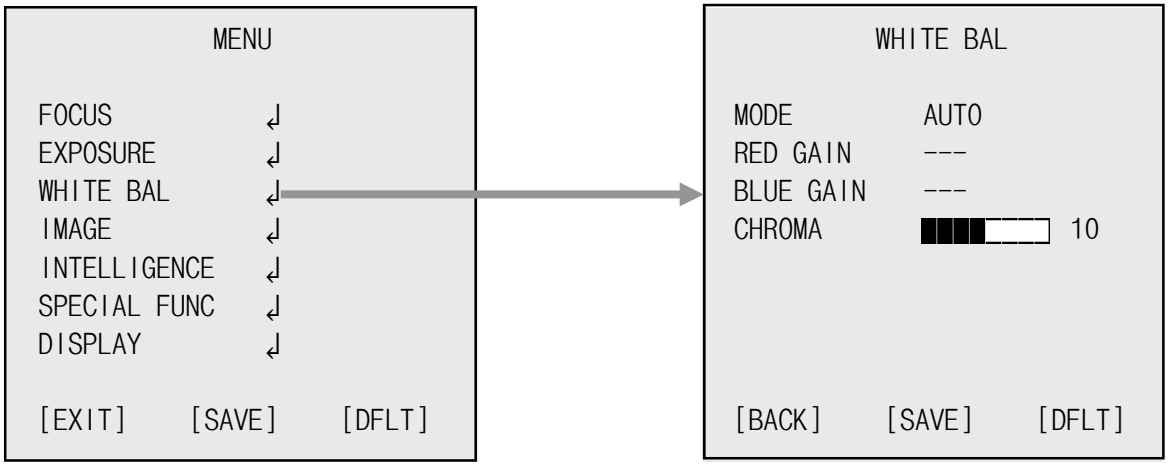
◈ WDR/BLC: Select WDR(Wide Dynamic Range) or BLC(Back Light compensation)
▶ WDR↲
▷ LEVEL: Adjust WDR level.
▶ LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH
※ WDR doesn't work in Manual Exposure Mode and Shutter Priority Mode.
※ When WDR on, CVBS output is disabled.
▶ BLC↲
▷ POSITION: Adjust the window position
▷ SIZE: Adjust the window size
※ Can't use WDR and BLC at the same time.
(When WDR On, BLC is Off. And when BLC is On, WDR is Off)
※ BLC doesn't work in Manual Exposure Mode.

◈ DAY&NIGHT: Select Day&Night
▶ MODE: AUTO↲ / EXT-IN↲/ DAY / NIGHT↲
▷ AUTO
▶ DELAY: 0 ~ 255 sec
▶ THRS: 0 ~ 28
Day↔Night switching level in Auto Mode. Switching in lower lux with lower threshold level.
▶ GAP: LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH
Margin between Day→Night switching level and Night→Day switching level.
▶ IR DETECTION: Setting IR Detection mode. (ON / OFF)
▶ IR DET LEVEL: Setting IR Detection level.
(LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH)
▶ BURST: OFF / ON

▷ EXT-IN
▶ DELAY: 0 ~ 255 sec
▶ BURST: OFF / ON
▶ POLARITY: External Input polarity (ACTIVE LOW / ACTIVE HIGH)

▷ NIGHT
▶ BURST: OFF / ON

◆ WHITE BALANCE



◈ AWB: Select WHITE BALANCE mode

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

▷ AUTO: Automatically adjusts color according to the available lighting.

▷ ONE PUSH: It is a fixed white balance mode that may be automatically readjusted only by pressing ONE PUSH

▷ MANUAL: Color can be corrected when the user increases or decreases “RED GAIN” or “BLUE GAIN”.

▷ INDOOR: Set color temperature to be Indoor light (3700°K)

▷ OUTDOOR: Set color temperature to be Outdoor light (5100°K)

◈RED GAIN: Adjust R gain value

▶ 0 ~ 20 steps

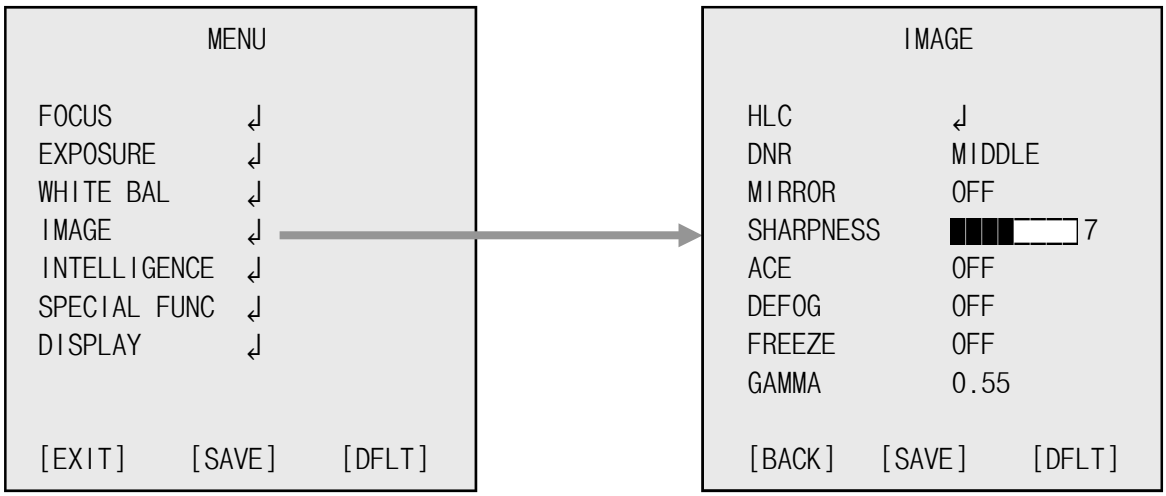
◈BLUE GAIN: Adjust B gain value

▶ 0 ~ 20 steps

◈ CHROMA: Adjust CHROMA gain value

▶ 0 ~ 20 steps

◆ IMAGE



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

▷ MODE: OFF / ON / NIGHT

▷ LEVEL: 0 ~ 20 steps

▷ COLOR: 0 ~ 13 steps

◈ DNR: Select Digital Noise Reduction

▶ OFF / LOW / MIDDLE / HIGH / AUTO

◈ MIRROR: Select a flip mode

▶ OFF / H / V / H&V

▷ H: You can flip the picture horizontally on the screen

▷ V: You can flip the picture vertically on the screen

▷ H&V: You can flip the picture horizontally & vertically on the screen

◈ SHARPNESS: Adjust sharpness level

▶ 0 ~ 10 steps

◈ ACE: Select Adaptive Contrast Enhancement (Digital Wide Dynamic Range)

▶ OFF / LOW / MIDDLE / HIGH

◈ DEFOG: Carry out defog function

▶ OFF / ON↲

▷ MODE: AUTO / MANUAL

▷ LEVEL: LOW / MIDDLE / HIGH

※ Can't use DEFOG and ACE at the same time
(When DEFOG is ON, ACE is Off)

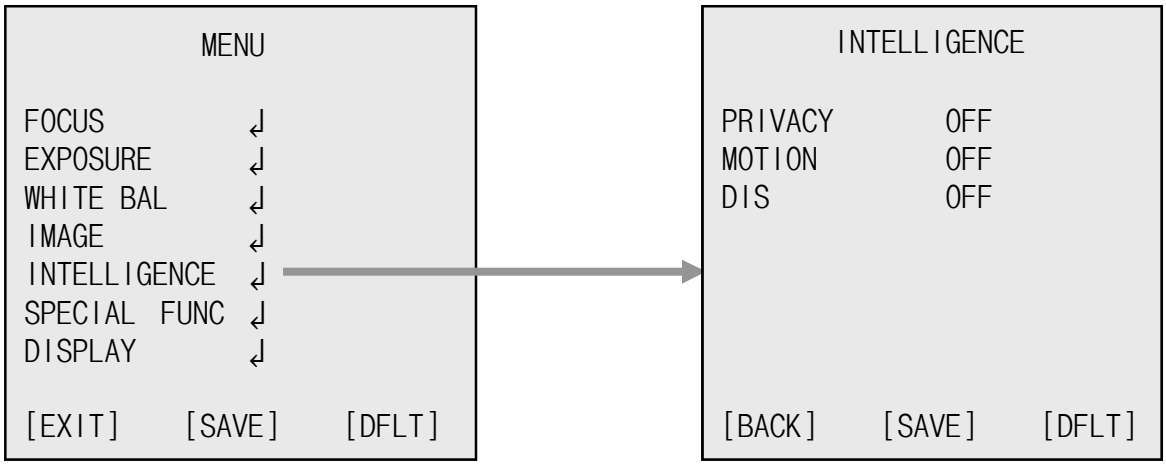
◈ Freeze: Select real or still mode

▶ OFF / ON

◈ GAMMA: Select GAMMA

▶ 0.45 / 0.55 / 0.65 / 0.75

◆ INTELLIGENCE



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

▶ OFF / ON↲

▷ MASK#: Select mask area number (1 ~ 24)

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

▷ POSITION: Adjust the mask position

▷ SIZE: Adjust the mask size

▷ COLOR: Select mask color (0 ~ 13)

▷ TRANS: Select mask transparency level (0 ~ 4)

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

▶ OFF / ON↲

▷ AREA#: Setting 3 areas(1~3) of motion detection

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

▷ SENSITIVITY: Adjust sensitivity of MD (0 ~ 20 steps)
More sensitive to setting to low step with sensitivity

▷ POSITION: Adjust the Area position

▷ SIZE: Adjust the Area size

▷ INTERVAL: Select the alarm interval time (0 ~ 255sec)

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

▷ ZOOM PRESET: Select Motion Zoom Preset Mode and Position
(OFF / ON↲)

◈ DIS: Select Digital Image Stabilizer mode

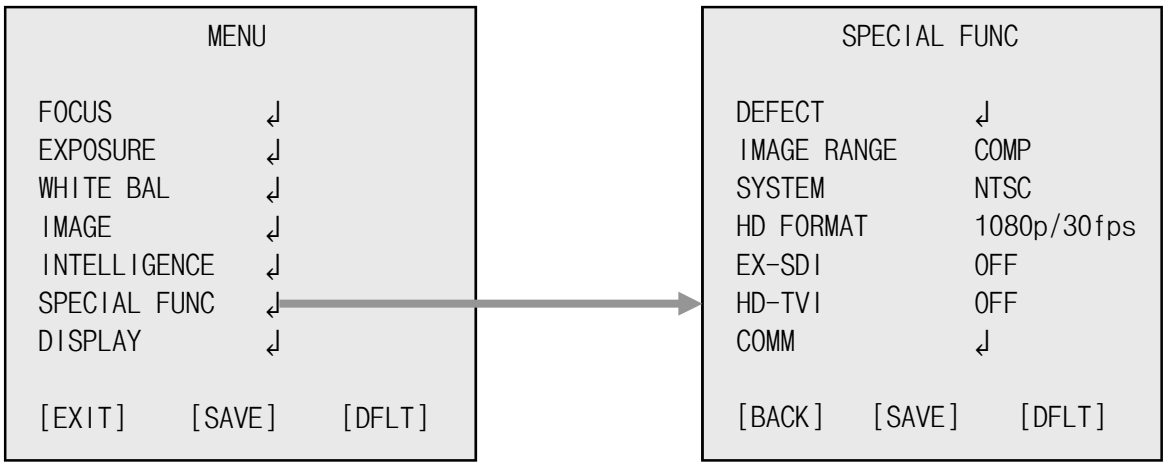
▶ OFF / ON↲

▷ RANGE: Setting the image compensation range. (10%, 20%, 30%)

▷ FILTER: Setting the sensitivity to hold DIS function in worst case. (LOW, MIDDLE, HIGH)

▷ AUTO C: Setting Auto Centering mode (OFF, HALF, FULL)

◆ SPECIAL FUNC



◈ DEFECT: Compensates for bad pixels that may occur. Occurs when the whole screen is in full black or if there is bad pixelation and it changes the THRS values until the screen is fixed.
※ When you use this function, the lens needs to be blocked from light getting into the lens.

◈ IMAGE RANGE: Select image bit range. (Full: 100%, Compressed: 75%)
- ▶ FULL, COMP, USER↲
  - ▷ LEVEL: Select user mode level (0 ~ 32)

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

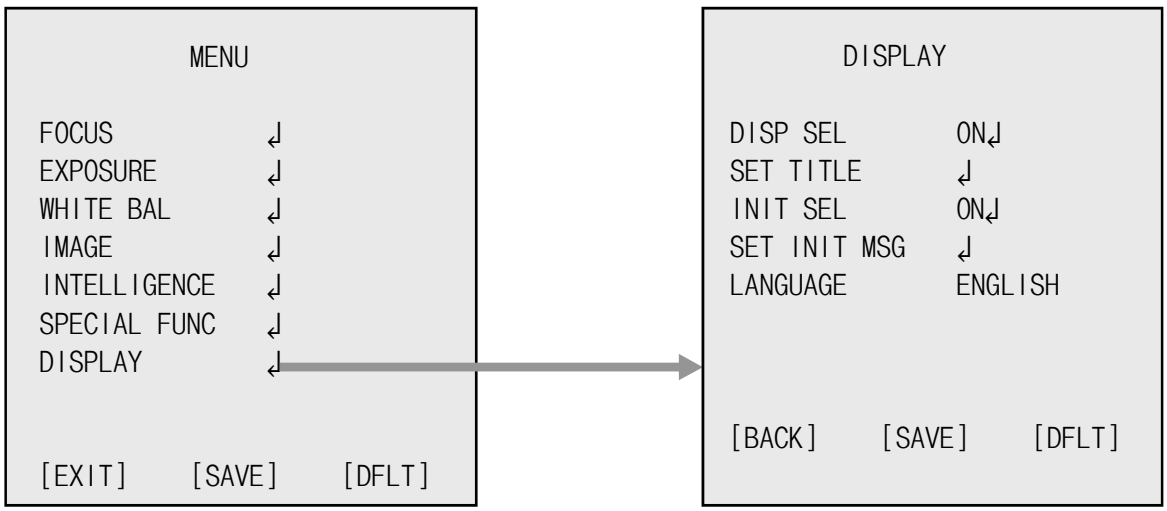
◈ HD FORMAT: Select Digital output
(1080p/30(25)fps, 1080p/60(50)fps, 720p/30(25)fps, 720p/60(50)fps)

◈ EX-SDI: Select EX-SDI mode (OFF / ON). Module type only.

◈ HD-TVI: Select HD-TVI mode (OFF / ON). Module type only.
※ When HD-TVI is on, the 1080p/60(50)fps mode cannot be selected.

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

◆ DISPLAY



◈ DISP SEL: Select display item.

▶ OFF / ON↲

▷ ID: OFF / ON

▷ TITLE: OFF / ON

▷ ZOOM RATIO: OFF / ON

▷ SYSTEM MSG: OFF / ON (MD Alarm and Wait message)

◈ SET TITLE: Select camera title menu (Text edit– max 40 characters)

◈ INIT SEL: Select display initial message.

▶ OFF / ON↲

▷ ID: OFF / ON

▷ BAUDRATE: OFF / ON

▷ PROTOCOL: OFF / ON

▷ VERSION: OFF / ON

▷ INIT MSG: OFF / ON

◈ SET INIT MSG: modify initial message. (Text edit – max 40 characters)

◈ LANGUAGE: Select language.

▶ English / Simplified Chinese / Traditional Chinese / Japanese

※ Character Table of Text edit Mode

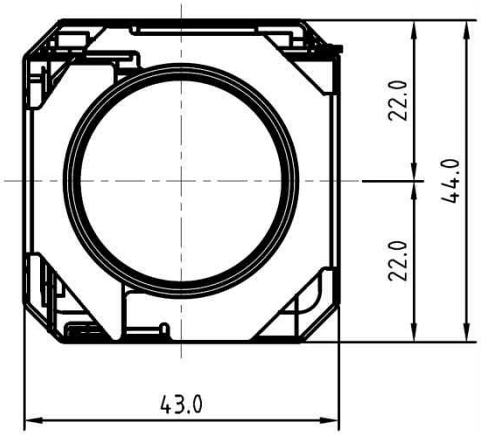
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z , .

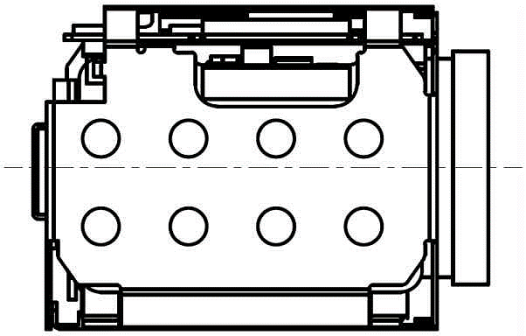
( ) { } [ ] 0 1 2 3 4 5 6 7 8 9 * + - / = ~ ! ? " ‘

Camera Dimensions

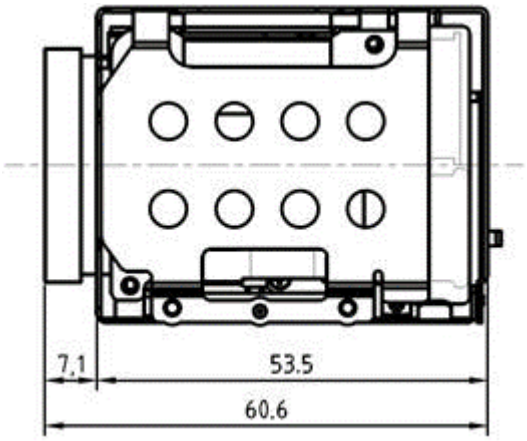
Front



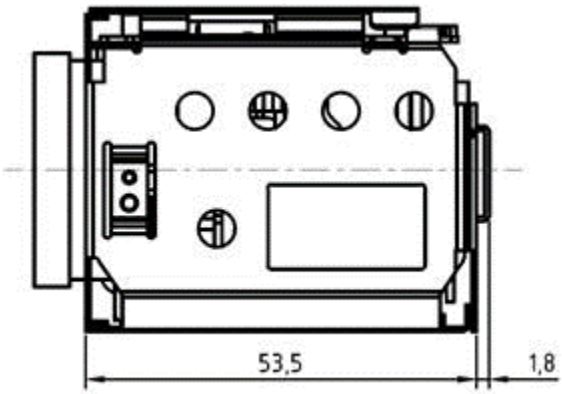
Left



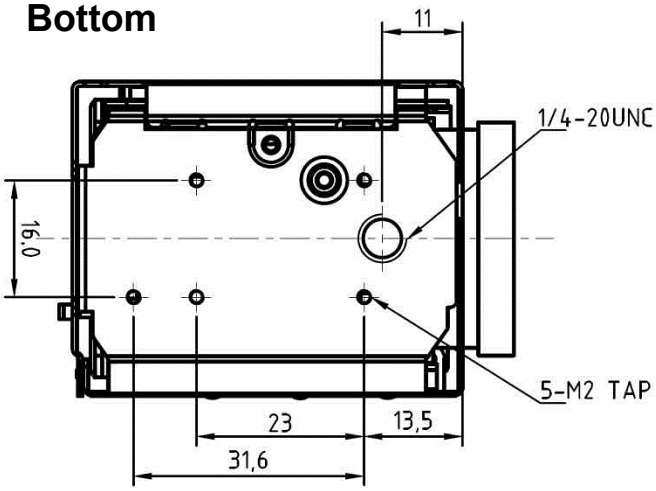
Top



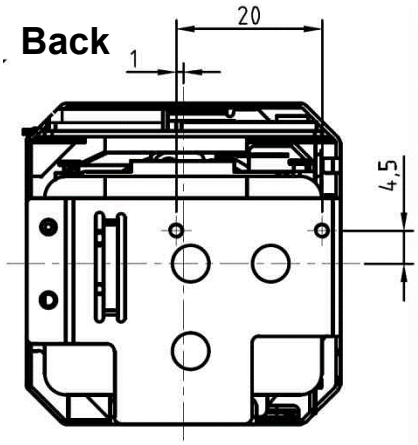
Right



Bottom



Back



APPROVALS

Active Silicon makes the following approval statements:	
CE	In accordance with the CE Marking regulations, the **Harrier 10x Autofocus-Zoom SDI Camera** is not a finished product and is supplied for further integration into a finished product that will be CE marked by the final manufacturer/integrator. Therefore, no CE marking or Declaration of Conformity is required or allowed.
RoHS3	This product is compliant with the RoHS3 requirements (Directive 2015/863/EU).
REACH	Please contact Active Silicon for the latest formal REACH declaration (EC 1907/2006).
EMC	This product is designed to be compliant with the following requirements when housed in a suitable enclosure: • EN 55022:2010 (Class A) and EN 55024:2010 (EU Directive 2014/30/EU Electromagnetic Compatibility • FCC Rules for Class A digital devices

ORDERING INFORMATION

PART NUMBER	***DESCRIPTION***
AS-CAM-10SHD-A	Harrier 10x AF-Zoom SDI Camera (3G-SDI/HD-SDI/EX-SDI/HD-TVI)
AS-CAM-10LHD-A	Harrier 10x AF-Zoom Camera (LVDS/EX-SDI)
AS-CIB-USBHDMI-002-10LHD-A	Harrier 10x AF-Zoom USB/HDMI Camera
AS-CIB-IP-00x-10LHD-A	Harrier 10x AF-Zoom Camera with Ethernet IP output. Variants: x=1 regular Ethernet, x=3 PoE

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19-May-2026 TRM Harr10x AFZ-SDI-Cam (w Sep20 v1.01)