



GOHD400

High Definition PTZ Camera

User Manual



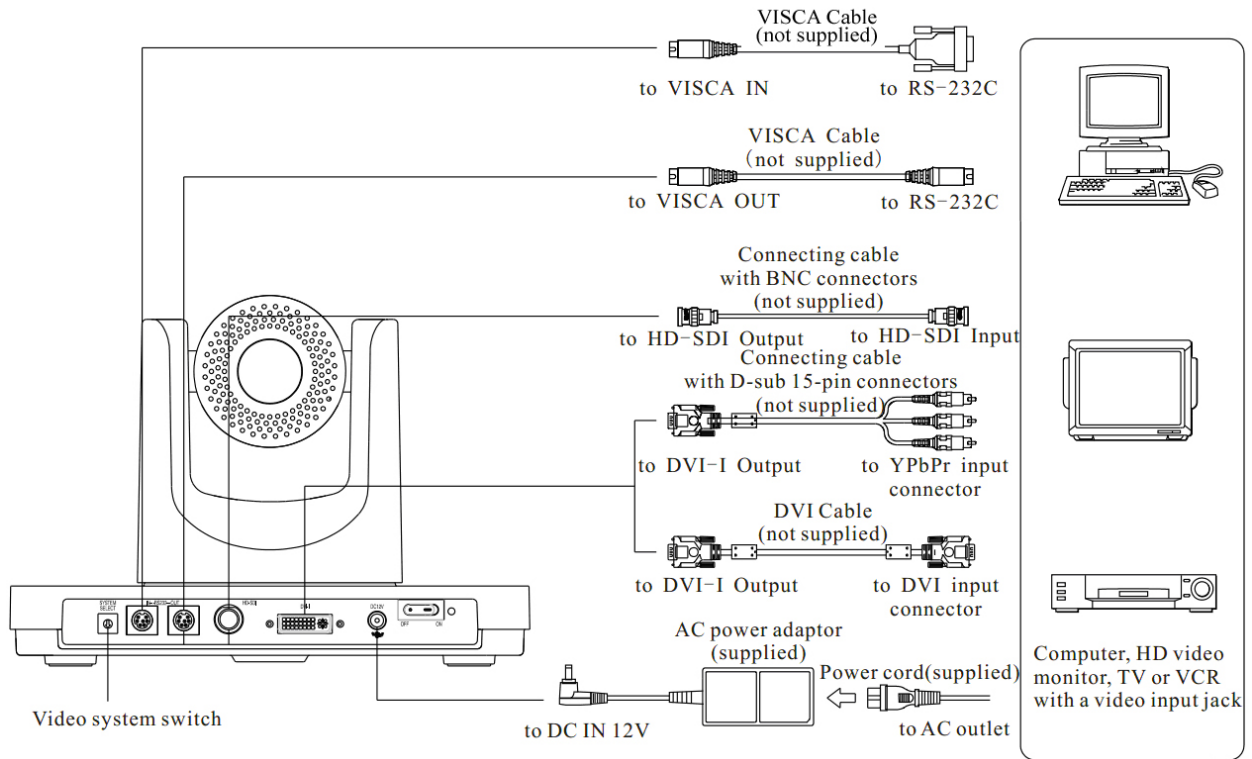
Precautions

- ❖ Do not subject the camera to moisture or extreme humidity.
- ❖ Do not attempt to disassemble the unit. Electric shock may occur.
- ❖ Do not operate with a third party power supply.
- ❖ Avoid vibration in transport, storage and installation.
- ❖ Do not grasp the camera head when carrying the camera. Do not attempt to turn the camera head by hand. Doing so may result in mechanical damage.
- ❖ Do not power on the camera before installation is completed.

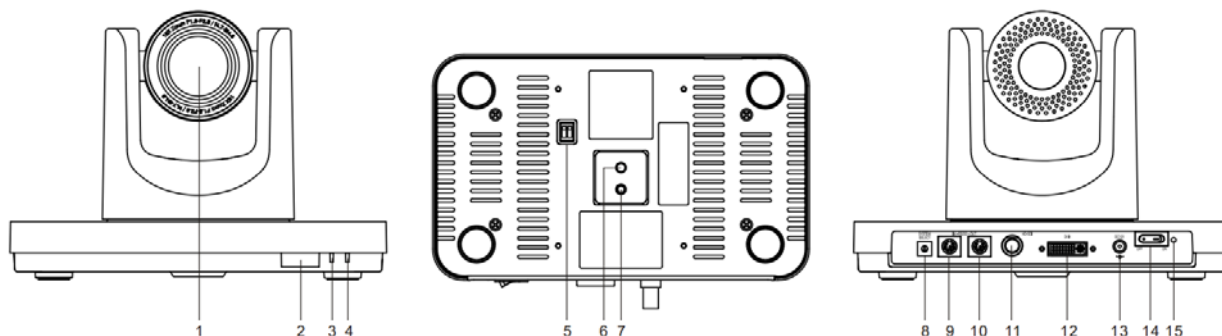
Package Contents

- ❖ Camera
- ❖ DVI male to HDMI female adapter
- ❖ AC power adapter
- ❖ Power cord
- ❖ IR remote control
- ❖ User Manual

Connections



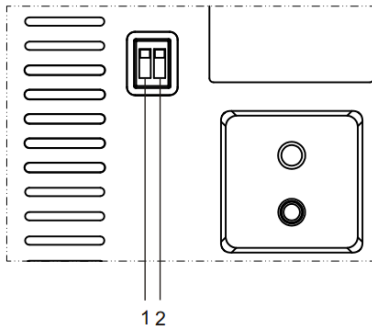
Locations of Controls



1. Lens
2. Sensor for IR remote control
3. POWER lamp
4. STANDBY lamp
5. BOTTOM switch
6. Tripod mount screw hole
7. Fixing screw hole
8. SYSTEM SELECT switch
9. RS232 IN
10. RS232 OUT
11. HD-SDI VIDEO OUT
12. DVI-I VIDEO OUT
13. DC IN 12V
14. POWER switch
15. POWER lamp

BOTTOM switch

Set the camera mode via the dip switches on bottom of camera



Set both Switch 1 and Switch 2 to the 'OFF' position for 'Normal Working Mode'

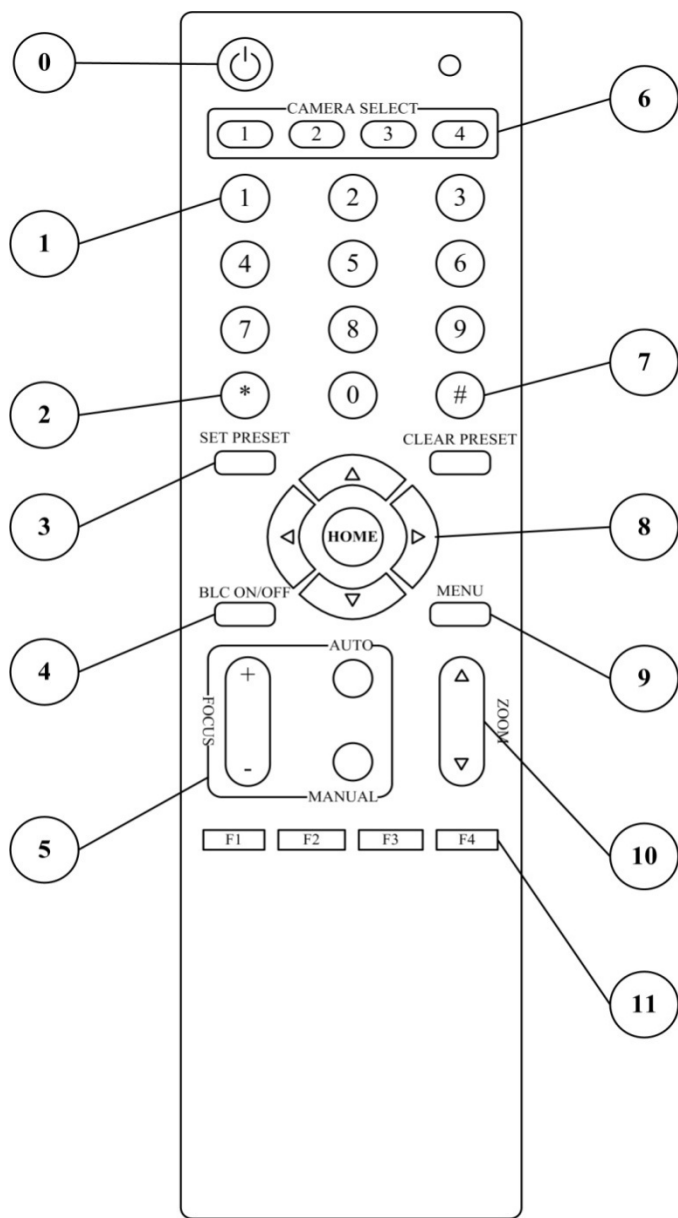
	SW-1	SW-2	MODE
1	OFF	OFF	Normal Working Mode
2	ON	OFF	Software Update Mode
3	OFF	ON	Factory Debug Mode
4	ON	ON	None

SYSTEM SELECT switch

This switch allows you to select the video format of the signal to be output from the VIDEO OUT connectors.

Switch Position	Video Format
0	1080p60
1	1080p50
2	1080i60
3	1080i50
4	720p60
5	720p50
6	1080p30
7	1080p25
8	720p30
9	720p25
A	1080p59.94
B	1080i59.94
C	720p59.94
D	1080p29.97
E	720p29.97
F	-

IMPORTANT: You must restart the camera if any changes to switches are made in order for changes to take effect.



IR Remote

0. STANDBY Button

Press this button to enter Standby Mode. Press it again to enter Normal Mode.

(Note: Power consumption in Standby Mode is approximately half of Normal Mode)

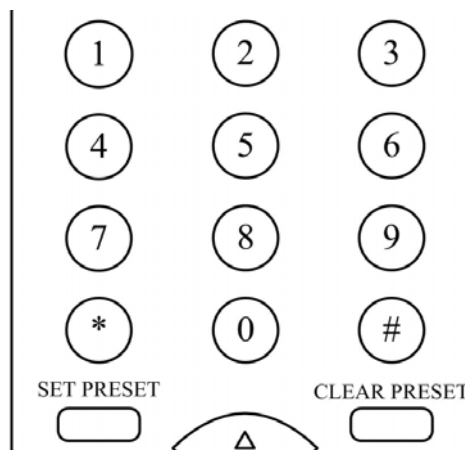
1. POSITION Buttons

Press any of the numeric buttons 0-9 directly to recall stored preset positions and settings.

Note: No action is executed if a relative preset position is not stored

2. * Button

3. SET/CLEAR PRESET Buttons



SET PRESET: To set a preset position press [SET PRESET] + Numeric button (0-9)

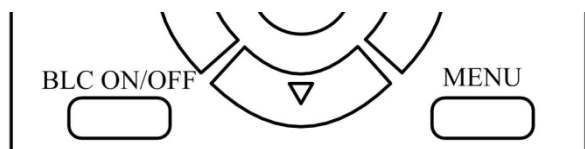
CLEAR PRESET: To erase a preset position press [CLEAR PRESET] +

6. CAMERA SELECT Buttons

Numeric button (0-9)

To erase all presets at once press
[*]+[#]+[CLEAR PRESET]

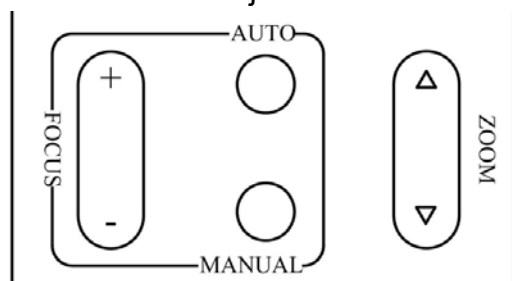
4. BLC ON/OFF Button



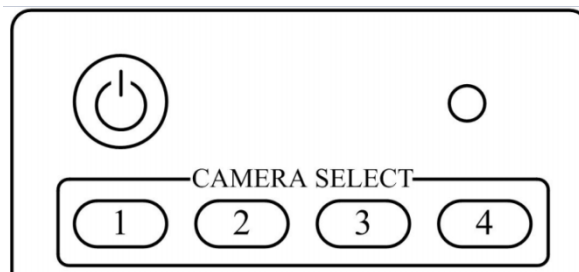
Press this button to enable backlight compensation. Press it again to disable backlight compensation.
(NOTE: Backlight compensation is effective only in full auto exposure mode)

5. FOCUS Buttons

Used for focus adjustment.



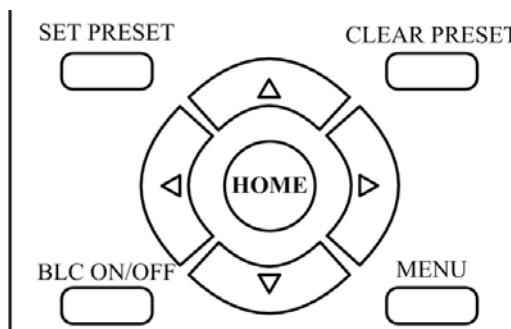
Press [AUTO] to adjust focus automatically.
Press [MANUAL] to adjust focus manually.
Adjust focus manually with [FOCUS+] (focus far) and [FOCUS-] (focus near) buttons.
Press and hold the [FOCUS+] and [FOCUS-] buttons: Focus continues until the button is released.
Note: [FOCUS+] and [FOCUS-] buttons can only be used in manual focus mode.



Press the button corresponding to the camera you want to operate with the remote controller.

7. # Button

8. PAN/TILT CONTROL Buttons



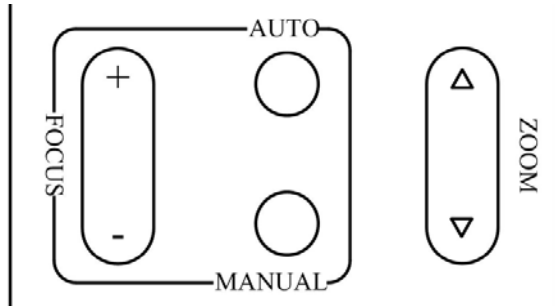
Move up: Press [▲]
Move down: Press [▼]
Move left: Press [◀]
Move right: Press [▶]

Return camera to home position: Press [HOME]
Press and hold the up/down/left/right button: Camera will continue rotating from slow to fast; the camera stops as soon as the button is released.

9. Menu Setting

Menu button: Press this button to enter or exit the on-screen display (OSD) menu.

10. ZOOM Buttons

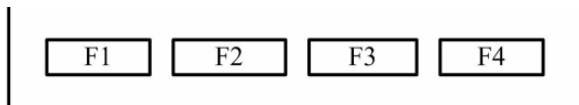


Zoom Out: Press [ZOOM▼]

Zoom In: Press [ZOOM▲]

Press and hold the ZOOM button: Camera will continue zooming in or zooming out until the button is released.

11. Set Camera IR Address Buttons



[*]+[#]+[F1]: Address1

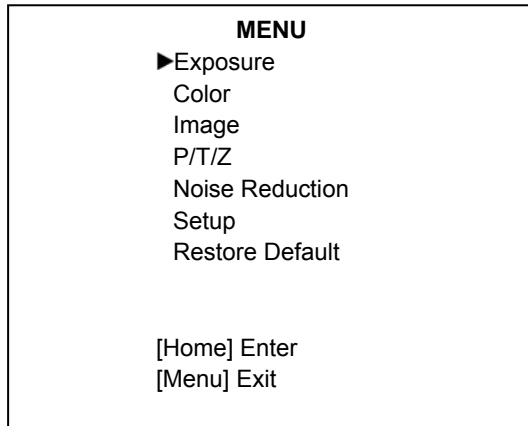
[*]+[#]+[F2]: Address2

[*]+[#]+[F3]: Address3

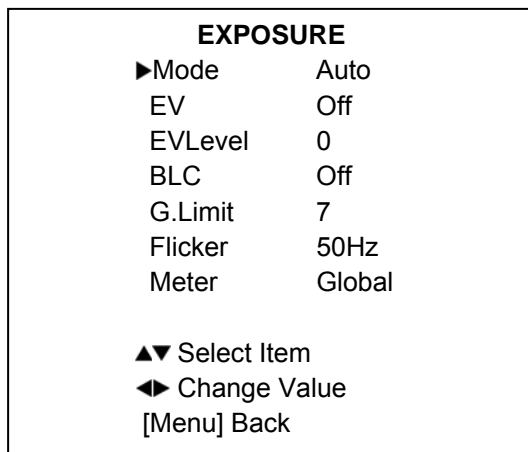
[*]+[#]+[F4]: Address4

Menu Settings

Press [MENU] button to display the main menu. Use arrow buttons to move the cursor to the item to be set. Press [HOME] button to enter the corresponding sub-menu.



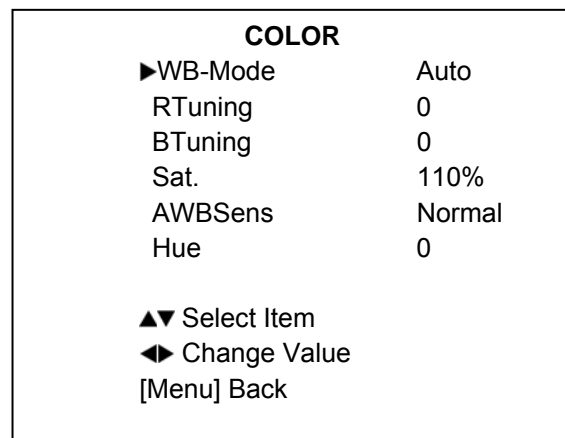
EXPOSURE



- **Mode** (Exposure Mode): Auto, Manual, SAE, AAE, Bright, WDR
- **EV** (Exposure Compensation): On, Off
- **EV Level** (Exposure Compensation Level): -7 ~ +7
- **BLC** (Backlight Compensation): On, Off
- **G.Limit** (Maximum Gain Limit): 0 ~ 15

- **Flicker** (Anti-Flicker): Off, 50Hz, 60Hz
- **Iris** (Aperture Value): F1.8, F2.0, F2.4, F2.8, F3.4, F4.0, F4.8, F5.6, F6.8, F8.0, F9.6, F11.0, Close (effective in Manual and AAE mode only)
- **Shutt** (Shutter Value): 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/90, 1/100, 1/125, 1/180, 1/250, 1/350, 1/500, 1/725, 1/1000, 1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/10000 (effective in Manual and SAE mode only)
- **Stren** (WDR Strength): 0 ~ 6 (effective in WDR mode only)
- **Meter** (Metering Mode): Global, Center
- **Bright** (Intensity Control): 00 ~ 23

COLOR



- **WB-Mode** (White Balance Mode): Auto, Indoor, Outdoor, Manual
- **RTuning** (Red Gain Fine-Tuning): -10 ~ +10 (effective in Auto, Indoor and Outdoor mode only)
- **BTuning** (Blue Gain Fine-Tuning): -10 ~ +10 (effective in Auto, Indoor and Outdoor mode only)
- **RG** (Red Gain): 0 ~ 255 (effective in Manual mode only)

- **BG** (Blue Gain): 0 ~ 255 (effective in Manual mode only)
- **Sat** (Saturation): 60% ~ 200%
- **AWBSens** (White Balance Sensitivity): Low, Normal, High
- **Hue** (AWB Tone): -7 ~ +7, Default 0 (effective in Manual mode only)

IMAGE

IMAGE	
▶ Brightness	0
Contrast	+2
Sharpness	6
B&W-Mode	Off
Flip-H	Off
Flip-V	Off
Gamma	0.45
▲▼ Select Item	
◀▶ Change Value	
[Menu] Back	

- **Brightness** (Brightness Adjustment): -5 ~ +5
- **Contrast** (Contrast Adjustment): 0 ~ 15
- **Sharpness** (Sharpness Adjustment): 0 ~ 15
- **B&W-Mode** (Black & White Mode): On, Off
- **Flip-H** (Horizontal Image Flip): On, Off
- **Flip-V** (Vertical Image Flip): On, Off
- **Gamma** (Gamma Adjustment): 0.31 ~ 0.83
- **D-HotPixel** (Dynamic Bad Points): Off,

P/T/Z

P/T/Z	
▶ SpeedByZ	On
L/R Set	STD
AF-Zone	Center
AF-Sense	Low
▲▼ Select Item	
◀▶ Change Value	
[Menu] Back	

- **SpeedByZ** (Depth of Field Scale): On, Off
- **L/R Set** (Reverse Remote Control): STD, REV
- **AF-Zone** (Auto Focus Zone - zone to bring in focus): Center, Bottom, Top
- **AF-Sense** (Auto Focus Sensitivity): Low, Normal, High

NOISE REDUCTION

NOISE REDUCTION	
▶ NR2D-Level	4
NR3D-Level	3
D-HotPixel	Off
DarkDetail	5
▲▼ Select Item	
◀▶ Change Value	
[Menu] Back	

- **NRD2-Level** (2D Noise Reduction): Off, 1 ~ 5
- **NR3D-Level** (3D Noise Reduction): Off, 1 ~ 5

RESTORE DEFAULT

Auto, 1 ~ 5 (Note: Used to mask the part of the color pixels generated by the machine overheating.)

- **DarkDetail** (Shadow Detail): 0 ~ 15 (Note: The higher the noise reduction level, the more image detail lost.)

SETUP

SETUP

▶ Language

EN

ColorSys	YPbPr
HDMIMode	Off
Protocol	VISCA
Address	1
AddrFix	Off
Net Mode	Serial
Baudrate	9600

▲▼ Select Item
◀▶ Change Value
[Menu] Back

RESTORE DEFAULT

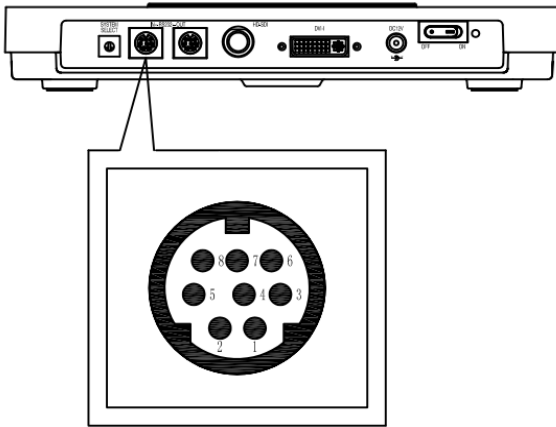
▶Restore? No

◀▶ Change Value
[Home] OK
[Menu] Back

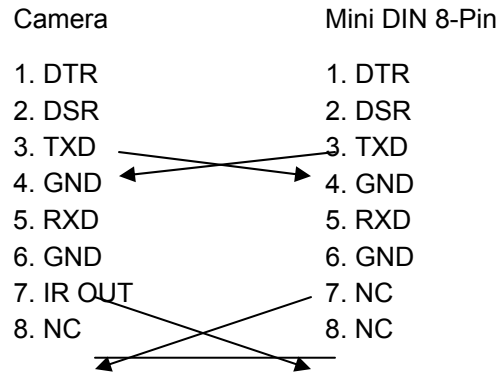
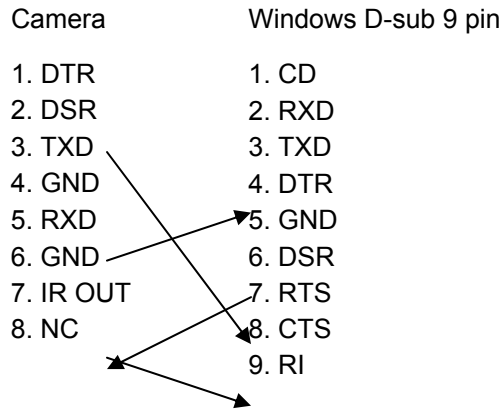
- **Restore?** (Restore Factory Settings): Yes, No. Press [HOME] for 3 seconds to restore factory settings. Note: Restoring factory settings will restore all parameters including IR remote controller address and serial address.

- **Language** (Menu Language): English, Chinese
- **ColorSys** (DVI System Color in Analog Signal): YPbPr RGB (only effective under 720p60 / 1080p60)
- **HDMIMode** (HDMI Output Signal Mode): On, Off
- **Protocol** (Control Protocol): VISCA, P-D, P-P
- **Address** (Protocol Address): VISCA: 1 ~ 7, P-P and P-D: 0 ~254
- **AddrFix**
- **Net Mode** (Net Mode of Camera): Serial, Parallel
- **Baudrate** (Serial Port Baud Rate): 2400, 4800, 9600

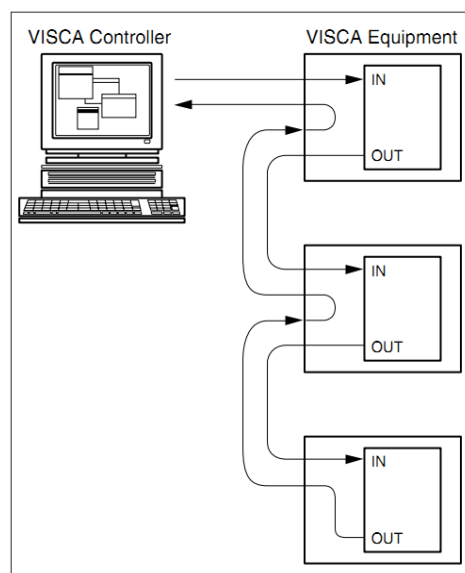
RS232-C Interface



No	Pins	Signal
1	DTR	Data Transmission Ready (OUTPUT)
2	DSR	Data Set Ready (INPUT)
3	TXD	Transmit Data (OUTPUT)
4	GND	Ground
5	RXD	Receive Data (INPUT)
6	GND	Ground
7	IR OUT	IR Commander Signal (OUTPUT)
8	NC	No Connection



VISCA Network Configuration



Serial Communication Control

In default working mode, the camera is able to connect to a VISCA controller with RS232C serial interface. The parameters of RS232C are as follows:

Baud rate: 2400/4800/9600 bit/s

Start bit: 1 bit

Data bit: 8 bits

Stop bit: 1bit

Parity bit: none

Pan-Tilt will rotate to the maximum top right position after the camera is powered on. It will return to the center position when the process of initialization is finished. Note: If the position preset 0 has been stored, the position preset 0 will be called up after initialization. Once initialization is complete, the user can control the camera with commands in the command list.

VISCA Command List

Camera-Issued Messages

Ack/Completion Message		
Command	Command Packet	Comments
ACK	z0 41 FF	Returned when the command is accepted.
Completion	z0 51 FF	Returned when the command has been executed.

z = Camera Address + 8

Error Messages		
Command	Command Packet	Comments
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted
Command Not Executable	z0 61 41 FF	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

Camera Control Command

Command	Function	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel		8x 21 FF	
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	p = 0(low) - 7(high) pqrs: Zoom Position
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	
CAM_Focus	Stop	8x 01 04 08 00 FF	p = 0(low) - 7(high) pqrs: Focus Position AF ON/OFF
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far(Variable)	8x 01 04 08 2p FF	
	Near(Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	
	Auto Focus	8x 01 04 38 02 FF	
	Manual Focus	8x 01 04 38 03 FF	
Auto/Manual	8x 01 04 38 10 FF		
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position

Camera Control Command (Cont'd)

CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor mode	8x 01 04 35 01 FF	Indoor mode
	Outdoor mode	8x 01 04 35 02 FF	Outdoor mode
	OnePush mode	8x 01 04 35 03 FF	One Push WB mode
	Manual	8x 01 04 35 05 FF	Manual Control mode
	Temperature mode	8x 01 04 35 2p FF	p:Color Temperature
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	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
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	WDR	8x 01 04 39 21 FF	WDR mode
	Low Light	8x 01 04 39 22 FF	Low Light 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_WDRStrength	Reset	8x 01 04 21 00 FF	WDR Level Setting
	Up	8x 01 04 21 02 FF	
	Down	8x 01 04 21 03 FF	
	Direct	8x 01 04 51 00 00 0p 0q FF	pq: WDR Level Positon

Camera Control Command (Cont'd)

CAM_LowLightLevel	Reset	8x 01 04 22 00 FF	Low Light Setting
	Up	8x 01 04 22 02 FF	
	Down	8x 01 04 22 03 FF	
	Direct	8x 01 04 52 00 00 0p 0q FF	pq: Low Light 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
CAM_BackLight	On	8x 01 04 33 02 FF	Back Light Compensation ON/OFF
	Off	8x 01 04 33 03 FF	
CAM_NR(2D)	-	8x 01 04 53 0p FF	p: NR Setting (0: OFF, level 1 to 5)
CAM_NR(3D)	-	8x 01 04 54 0p FF	p: NR Setting (0: OFF, level 1 to 5)
CAM_Flicker	-	8x 01 04 23 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz)
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
CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p: Memory Number(=0 to 9) Corresponds to 0 to 9 on the Remote Commander.(Different with EVI-HD1)
	Set	8x 01 04 3F 01 0p FF	
	Recall	8x 01 04 3F 02 0p FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Image Flip Horizontal ON/OFF
	Off	8x 01 04 61 03 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Image Flip Vertical ON/OFF
	Off	8x 01 04 66 03 FF	
CAM_ColorGain	Direct	8x 01 04 49 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (200%)
CAM_ICR	ON	8x 01 04 01 02 FF	Infrared Mode ON/OFF
	OFF	8x 01 04 01 03 FF	
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
IR_Receive	On	8x 01 06 08 02 FF	IR(remote commander)receive ON/OFF
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ReceiveResponse	On	8x 01 7D 01 03 00 00 FF	IR(remote commander)receive message via the VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	

Camera Control Command (Cont'd)

Pan_tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt speed 0x01 (low speed) to 0x14 (high speed) YYYY: Pan Position(TBD) ZZZZ: Tilt Position(TBD)
	Down	8x 01 06 01 VV WW 03 02 FF	
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	
	Upleft	8x 01 06 01 VV WW 01 01 FF	
	Upright	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
Reset	8x 01 06 05 FF		
Pan_tiltLimitSet	LimitSet	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W: 1 UpRight 0: DownLeft YYYY: Pan Limit Position ZZZZ: Tilt Position
	LimitClear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	
CAM_AFSensitivity	High	8x 01 04 58 01 FF	AF Sensitivity High/Normal/Low
	Normal	8x 01 04 58 02 FF	
	Low	8x 01 04 58 03 FF	
CAM_SettingReset	Reset	8x 01 04 A0 10 FF	Reset Factory Setting
CAM_Iridix	Direct	8x 01 04 A7 00 00 0p 0q FF	pq: Iridix Position
Color System	RGB	8x 01 04 A8 02 FF	Only valid in 720p60/1080p60
	YPbPr	8x 01 04 A8 03 FF	
CAM_AWBSensitivity	High	8x 01 04 A9 00 FF	High
	Normal	8x 01 04 A9 01 FF	Normal
	Low	8x 01 04 A9 02 FF	Low
CAM_AFZone	Top	8x 01 04 AA 00 FF	AF Zone weight select
	Center	8x 01 04 AA 01 FF	
	Bottom	8x 01 04 AA 02 FF	

Camera Control Command (Cont'd)

CAM_DVIMode	HDMI	8x 01 04 AB 02 FF	DVI output mode, default: HDMI
	DVI	8x 01 04 AB 03 FF	
CAM_ColorHue	Direct	8x 01 04 4F 00 00 00 0p FF	p: Color Hue setting 0h (- 7 dgree) to Eh (+7 degrees)
CAM_Gamma		8x 01 04 5B 0p FF	p: Gamma setting (0x00~0x0A)

Query Command

Command	Command packed	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusAFModelnq	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_WBModelnq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	Indoor mode
		y0 50 02 FF	Outdoor mode
		y0 50 03 FF	OnePush mode
		y0 50 05 FF	Manual
		y0 50 2p FF	p:Color Temperature
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModelnq	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 21 FF	WDR
		y0 50 22 FF	Low Light
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_WDRStrengthInq	8x 09 04 B1 FF	y0 50 00 00 0p 0q FF	pq: WDR Strength
CAM_LowLightLevInq	8x 09 04 B2 FF	y0 50 00 00 0p 0q FF	pq: Low Light Level
CAM_ExpCompModelnq	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_BacklightModelnq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Noise2DModelnq	8x 09 04 53 FF	y0 50 0p FF	Noise Reduction (2D) p: 0 to 5

Query Command (Cont'd)

CAM_Noise3DModelInq	8x 09 04 54 FF	y0 50 0p FF	Noise Reduction (3D) p: 0 to 5
CAM_FlickerModelInq	8x 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz)
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.
SYS_MenuModelInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureFlipInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 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 ab cd mn pq rs tu vw FF	ab: Factory Code(08: VHD) cd: Hardware Version mnpq: ARM Version rstu: FPGA Version vw: Socket Number
VideoSystemInq	8x 09 06 23 FF	y0 50 00 FF	1920x1080i60
		y0 50 01 FF	1920x1080p30
		y0 50 02 FF	1280x720p60
		y0 50 03 FF	1280x720p30
		y0 50 07 FF	1920x1080p60
		y0 50 08 FF	1920x1080i50
		y0 50 09 FF	1920x1080p25
		y0 50 0A FF	1280x720p50
		y0 50 0B FF	1280x720p25
		y0 50 0F FF	1920x1080p50
IR_Receive	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_ReceiveReturn		y0 07 7D 01 04 00 FF	Power ON/OFF
		y0 07 7D 01 04 07 FF	Zoom tele/wide
		y0 07 7D 01 04 38 FF	AF On/Off
		y0 07 7D 01 04 33 FF	CAM_Backlight
		y0 07 7D 01 04 3F FF	CAM_Memory
		y0 07 7D 01 06 01 FF	Pan_tiltDrive
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed zz: Tilt Max Speed
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	www: Pan Position zzzz: Tilt Position
CAM_AFSensitivityInq	8x 09 04 58 FF	y0 50 01 FF	High
		y0 50 02 FF	Normal
		y0 50 03 FF	Low

Query Command (Cont'd)

CAM_IridixInq	8x 09 04 A7 FF	y0 50 00 00 0p 0q FF	pq: Iridix Position
Color System Inq	8x 09 04 A8 FF	y0 50 02 FF	VGA Mode On
		y0 50 03 FF	VGA Mode Off
CAM_GammaInq	8x 09 04 5B FF	y0 50 0p FF	p: Gamma setting (0x00~0x0A)
CAM_AFZone	8x 09 04 AA FF	y0 50 00 FF	Top
		y0 50 01 FF	Center
		y0 50 02 FF	Bottom
CAM_DVIModeInq	8x 09 04 AB FF	y0 50 02 FF	DVI Mode:HDMI
		y0 50 03 FF	DVI Mode:DVI
CAM_ColorHueInq	8x 09 04 4F FF	y0 50 00 00 00 0p FF	p: Color Hue setting 0h (- 7 degrees) to Eh (+7 degrees)
CAM_AWBSensitivityInq	8x 09 04 A9 FF	y0 50 00 FF	High
		y0 50 01 FF	Normal
		y0 50 02 FF	Low

Custom Control Command

Command	Function	Command packed	Comments
CAM_Power	On	8x 02 16 16 16 65 FF	Custom Power ON/OFF
	OFF(Standby)	8x 02 16 16 16 56 FF	
TCL_Power	TCL Standby	8x 01 02 75 75 01 04 FF	Forwarding AD DA 02 B0 01 04 AF FA
	TCL Wakeup	8x 01 02 75 75 00 03 FF	Forwarding AD DA 02 B0 00 03 AF FA

Customize the Query Command

Command	Command Packed	Inquiry Packet	Comments
CAM_StatusInq	8x 02 20 01 01 FF	y0 50 0p 00 0q rs 0t 0u FF	p:Error code q:License rs:Video format t:Flip mode u:Running status

Note: The [x] in the above table is the camera address, [y] = [x + 8].

Pelco-D Protocol Command List

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt Speed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt Speed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt Speed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt Speed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom Out	0xFF	Address	0x00	0x40	0x00	0x00	SUM
Focus Far	0xFF	Address	0x00	0x80	0x00	0x00	SUM
Focus Near	0xFF	Address	0x01	0x00	0x00	0x00	SUM
Set Preset	0xFF	Address	0x00	0x03	0x00	Preset ID	SUM
Clear Preset	0xFF	Address	0x00	0x05	0x00	Preset ID	SUM
Call Preset	0xFF	Address	0x00	0x07	0x00	Preset ID	SUM
Auto Focus	0xFF	Address	0x00	0x2B	0x00	0x01	SUM
Manual Focus	0xFF	Address	0x00	0x2B	0x00	0x02	SUM
Query Pan Position	0xFF	Address	0x00	0x51	0x00	0x00	SUM
Query Pan Position Response	0xFF	Address	0x00	0x59	Value High Byte	Value Low Byte	SUM
Query Tilt Position	0xFF	Address	0x00	0x53	0x00	0x00	SUM
Query Tilt Position Response	0xFF	Address	0x00	0x5B	Value High Byte	Value Low Byte	SUM
Query Zoom Position	0xFF	Address	0x00	0x55	0x00	0x00	SUM
Query Zoom Position Response	0xFF	Address	0x00	0x5D	Value High Byte	Value Low Byte	SUM

Pelco-P Protocol Command List

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Up	0xA0	Address	0x00	0x08	Pan Speed	Tilt Speed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Speed	Tilt Speed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Speed	Tilt Speed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Speed	Tilt Speed	0xAF	XOR
Zoom In	0xA0	Address	0x00	0x20	0x00	0x00	0xAF	XOR
Zoom Out	0xA0	Address	0x00	0x40	0x00	0x00	0xAF	XOR
Focus Far	0xA0	Address	0x00	0x80	0x00	0x00	0xAF	XOR
Focus Near	0xA0	Address	0x01	0x00	0x00	0x00	0xAF	XOR
Set Preset	0xA0	Address	0x00	0x03	0x00	Preset ID	0xAF	XOR
Clear Preset	0xA0	Address	0x00	0x05	0x00	Preset ID	0xAF	XOR
Call Preset	0xA0	Address	0x00	0x07	0x00	Preset ID	0xAF	XOR
Auto Focus	0xA0	Address	0x00	0x2B	0x00	0x01	0xAF	XOR
Manual Focus	0xA0	Address	0x00	0x2B	0x00	0x02	0xAF	XOR
Query Pan Position	0xA0	Address	0x00	0x51	0x00	0x00	0xAF	XOR
Query Pan Position Response	0xA0	Address	0x00	0x59	Value High Byte	Value Low Byte	0xAF	XOR
Query Tilt Position	0xA0	Address	0x00	0x53	0x00	0x00	0xAF	XOR
Query Tilt Position Response	0xA0	Address	0x00	0x5B	Value High Byte	Value Low Byte	0xAF	XOR
Query Zoom Position	0xA0	Address	0x00	0x55	0x00	0x00	0xAF	XOR
Query Zoom Position Response	0xA0	Address	0x00	0x5D	Value High Byte	Value Low Byte	0xAF	XOR

Product Specifications

Video Output Interface	DVI(HDMI, YPbPr), HD-SDI	Pan Speed Range	1.7° ~ 100°/s
Video Format	1080p/60,1080p/59.94,1080p/50,1080p/30,1080p/29.97,1080p/25,1080i/60,1080i/59.94,1080i/50,720p/60,720p/59.94,720p/50,720p/30,720p/29.97,720p/25	Tilt Speed Range	1.7° ~ 69.9°/s
Sensor Type	CMOS, 1/2.7 inch	Invertible	Yes
Sensor Pixel	Effective Pixel: 2.07 million; Total Pixel: 2.74 million	Number of preset	128
Lens	20x, f4.42mm ~ 88.5mm, F1.8 ~ F2.8	Preset Accuracy	≤0.1°
Focus Mode	Auto, Manual	Control Signal Interface	8 Pin Mini DIN
Electronic shutter	1/25s ~ 1/10000s	Support Protocol Type	VISCA, Pelco-D, Pelco-P
White Balance	Auto, Indoor, Outdoor, Manual	WDR Dynamic Range	≥100dB
Backlight Compensation	Yes (selectable)	Power Adapter	DC12V/2.0A
SNR	≥55dB	Power Consumption	18W
Horizontal Angle of View	55.2° ~ 3.2°	Size	240mm x 144mm x 160mm
Vertical Angle of View	42.1° ~ 2.4°	Weight	2.5Kg
Horizontal Rotation Range	±170°	Operating Temperature	-5 ~ 50°
Vertical rotation range	-30° ~ +90°	Storage Temperature	-20 ~ 60°

Maintenance and Troubleshooting

Care of Unit

- If camera will not be used for an extended period of time, turn off the power switch and disconnect the AC power cord of AC adaptor from the outlet.
- Use soft cloth or tissue to clean the camera cover.
- Use soft dry cloth to clean camera lens. If camera is very dirty, clean it with diluted neuter detergent. Do not use any type of solvents which may damages the surface.

Operation and Storage Locations

- Do not shoot images that are extremely bright (e.g., light sources, the sun, etc.) for long periods of time.
- Do not operate or store where camera is subject to unstable (flickering, etc.) lighting conditions.
- Do not operate or store where camera is subject to powerful electromagnetic radiation, such as TV or radio transmitters, etc.

Troubleshooting

- No image.
 1. Check that the power cord is connected, voltage is correct, POWER lamp is lit.
 2. Verify that the camera "self-tests" when powered on.
 3. Check the BOTTOM switch and make sure both switches are set to OFF.
 4. Check that the video cable is connected correctly.
- Abnormal display of image.
 1. Check that the video cable is connected correctly.
- Image dithering even at widest zoom position
 1. Check that camera is mounted securely.
 2. Verify that camera is not mounted near any vibrations.
- IR remote does not control the camera
 1. Verify the camera working mode (BOTTOM switches set to OFF).
 2. Verify that the correct camera number is selected (1, 2, 3 or 4) on the remote for the camera you want to control.
 3. Change the remote controller battery.
 4. Verify that the IR sensor on the front base of camera is not blocked.
- Serial communication does not control the camera
 1. Verify the camera working mode.
 2. Check that the control cable is connected correctly.

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