

HI-RES. OSD CAMERA

USER MANUAL

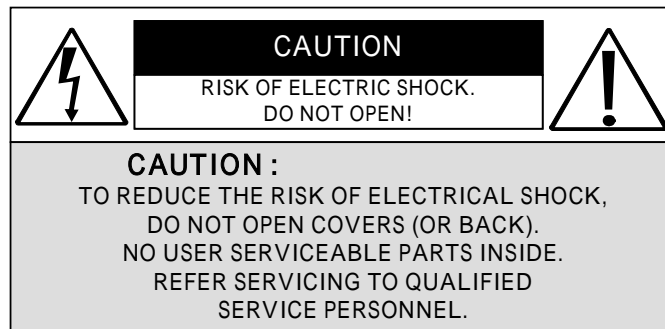


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1. SAFETY PRECAUTIONS



It is advised to read the Safety Precaution Guide through carefully before operating the product, to prevent any possible danger.

 **WARNING:** Alert the user to the presence of un-insulated “dangerous voltage”.

 **CAUTION:** Alert the user the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the appliance.

Please be extra careful not to shake the product.

Please avoid places where frequent vibrations or shocks.

Do not install the product in extreme temperature conditions.

Only use the camera under conditions where temperatures are between -10 °C and +50 °C .
Be especially careful to provide ventilation when operating under high temperatures.

Do not install the product in an environment where the humidity is high.

Unless the product is waterproof or weatherproof, otherwise it can cause the image quality to be poor.

Never keep the product to direct strong light or sunlight.

It can damage the product.

Do not spill liquid of any kind on the product.

If it gets wet, wipe it dry immediately. Alcohol or beverage can contain minerals that corrode the electronic components.

When any abnormal occurs, make sure to unplug the unit, and contact your local dealer.

2. INTRODUCTION



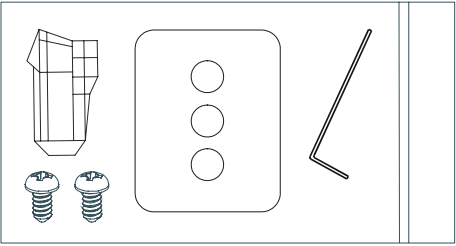
This digital image camera uses a high sensitive color 1/3" interline transfer Charge Coupled Device (CCD) image sensor, featuring approx.: NTSC = 380,000/ PAL = 440,000 effective pixels, producing pictures reaching **550 TVL** of horizontal resolution. Built-in ICR module provides excellent low lux effect. Remote control is available via RS-485/ RS-422 or RS-232 (optional) interface.

3. FEATURES

- High sensitivity, low smear, high anti-blooming, and high S/N ratio.
- Mechanic IR cut-filter driving unit with AE/ Illumination Detector (sensor), provides change from color to B&W mode automatically for day and night 24-hour surveillance.
- OSD (On Screen Display) Setup Menu.
- Camera tile setup of up to 16 alphanumeric letters.
- Privacy image masking with free position.
- Camera control via either RS-422/RS485 or RS232 interface.
- Supports PELCO (D and P) Protocol/ NATIVE Protocol/ LG Protocol.
- Supports AES (Automatic Electronic Shutter), AI (Auto Iris), GC (Gain Control), WB (White Balance), and BLC (Back Light Compensation).
- Provides flickerless mode, color rolling suppression, and line-lock function.
- The camera accepts 2 types of auto iris lenses Video type (Video-Drive) and DC type (DC-Drive).
- Performance: Positive/ negative image, mirror function (left/ right).
- Under low lux environment camera with Hi-Res.+ Ex-view function has better ability to work in low-light conditions (more sensitive to light) than camera with Hi-Res. function.

4. PACKAGE LIST

Check and make sure all the items shown below are included in your product package.
If something is missing, contact your dealer as soon as possible.

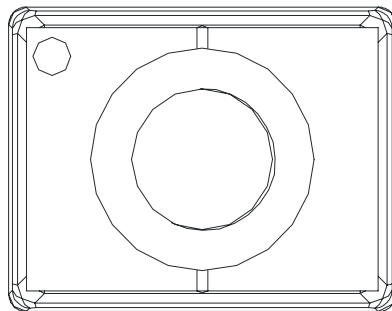
No.	Item	Picture	Quantity
1	Camera		1
2	Manual		1
3	Auto Iris Lens Plug Mounting Block Fixed Screws L-Wrench		1

5. NAME and FUNCTION of EACH PART

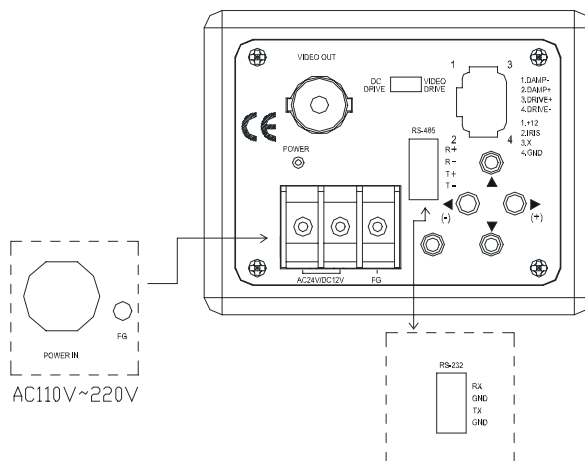
Side View



Front View



Rear View



1. Video Output: Composite Video 1Vp-p, 75 Ohms, BNC.

2. Key Control:

No.	Name	Function
1	▲	Up (▲)
2	▼	Down (▼)
3	(+)/▶	Increase Value (+)
4	(-)/◀	Decrease Value (-)
5	Menu	Enter or Exit Setup Menu

3. Protocol: AUTO/ NATIVE/ PELCO/ LG

4. Baud Rates: 2.4K/ 4.8K/ 9.6K/ 19.2K BPS

RS-232:

No.	Name	Function
1	RX	RS-232 Interface RX
2	GND	GND
3	TX	RS-232 Interface TX
4	GND	GND

RS-485/ RS-422:

No.	Name	Function
1	R+	RS-485/RS-422 Interface R+
2	R-	RS-485/RS-422 Interface R-
3	T+	RS-485/RS-422 Interface T+
4	T-	RS-485/RS-422 Interface T-

6. INSTALLATION

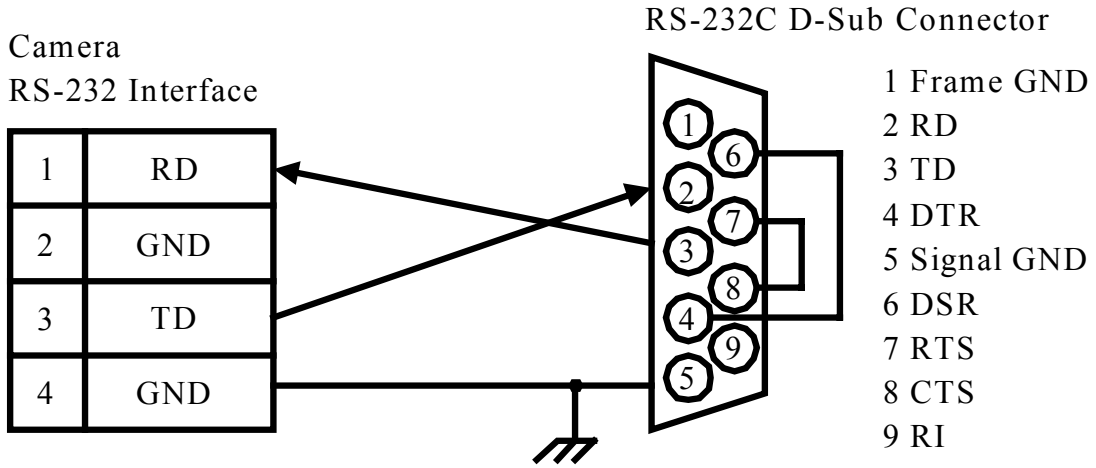


Figure 6-1

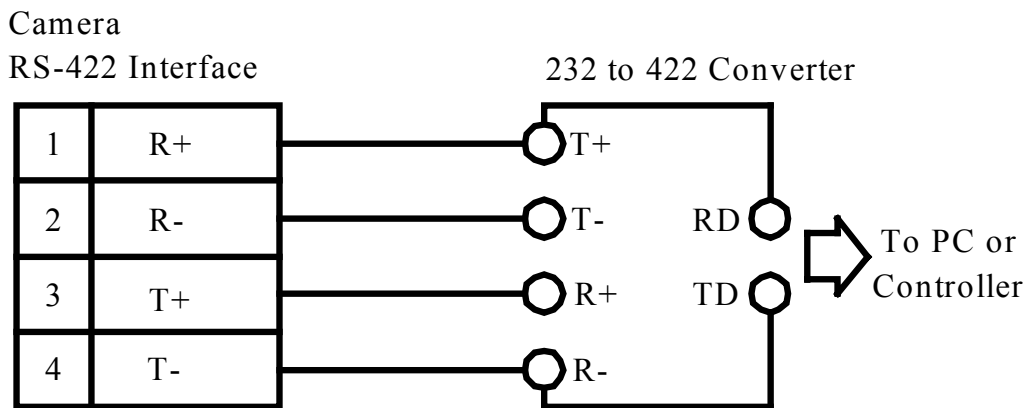


Figure 6-2

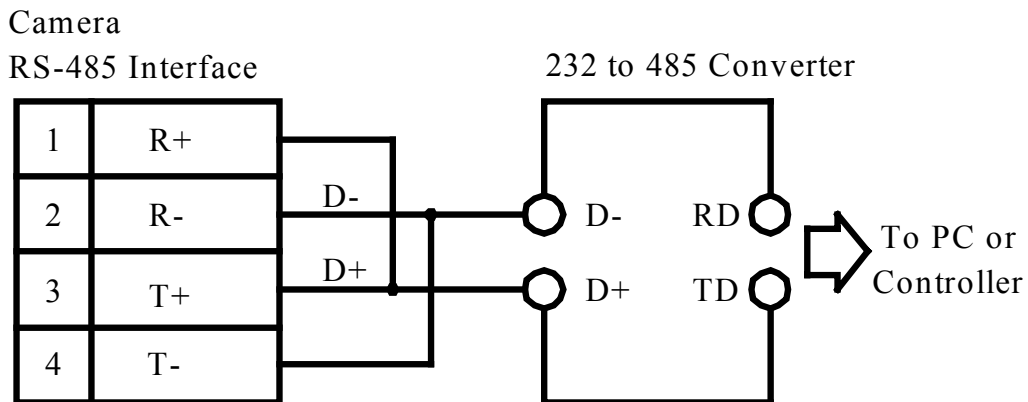


Figure 6-3

6.1 Native Keyboard Installation

- RS-485 interface is used for communicating native keyboard. Refer to Figure 6-3; connect R+ and T+ of the camera together; connect R+ and T+ of the camera to D+ of the native keyboard. Connect R- and T- of the camera together; connect R- and T- of the camera to D- of the native keyboard.
- User may adjust Camera ID, Protocol, Speed and Parity should only be adjusted via rear panel keys.

Communication	Setting
CAMERA ID	1 - 127
PROTOCOL	AUTO/ NATIVE
SPEED	9600
PARITY	NONE

The speed of native keyboard is fixed (9600), and the adjusted function is only effective, after exiting the OSD setup menu.

6.2 PELCO Keyboard (or compatible) Installation

- RS-422 interface is used for communicating PELCO keyboard. Refer to Figure 6-2; connect R+ of the camera to T+ of the PELCO keyboard. Connect R- of the camera to T- of the PELCO keyboard.
- User may adjust Camera ID via rear panel keys or via remote commands. Protocol, Speed and Parity should only be adjusted via rear panel keys.

Communication	Setting
CAMERA ID	0 - 253 for P protocol
	1 - 255 for D protocol
PROTOCOL	AUTO/ PELCO
SPEED	2400/ 4800/ 9600/ 19200
PARITY	NONE

The speed of camera should be the same as the speed of the keyboard, and the adjusted function is only effective, after exiting the OSD setup menu.

NOTE: Maximum cable distance for RS-422/ RS-485 communication over 24-gauge wire is 4,000 feet (1,219 m). Recommend using shielded twisted pair cable that meets the basic requirements for EIA RS-422 / RS-485 applications.

7. OPERATION

7.1 Operating Procedure

1. Mount the camera on the mounting bracket, secure the camera (find the hole on the top or bottom of the camera) to the bracket with the supplied mounting block and 2 screws.
2. Connect the video output to the monitor or other video device via a 75 Ohms type coaxial cable.
3. Power Input Terminal (Dual Power): the camera accepts both AC 24V and DC 12 V power sources (non-polarity).

7.2 Native Keyboard Operation

Normal Display Mode

Native Keyboard	Camera Function
BRIGHTNESS+	Brightness +
BRIGHTNESS-	Brightness -
Zoom TELE	None
Zoom WIDE	None
NEAR	None
FAR	None
Move Joystick Left	None
Move Joystick Right	None
Move Joystick Up	None
Move Joystick Down	None
MENU key	Accessing OSD Main Menu

OSD Setup Menu Mode

Native Keyboard	Camera Function
◀	Decrease (-)
▶	Increase (+)
▲	Cursor Up
▼	Cursor Down
BRIGHTNESS+	None
BRIGHTNESS-	None
Zoom TELE	None
Zoom WIDE	None
NEAR	None
FAR	None

Please refer to the native keyboard manual for more information.

7.3 PELCO Keyboard (or compatible) Operation

Normal Display Mode

PELCO Keyboard	Camera Function
OPEN	Brightness +
CLOSE	Brightness -
Twist Joystick clockwise or Zoom In	None
Twist Joystick counterclockwise or Zoom Out	None
NEAR	None
FAR	None
Move Joystick Left	None
Move Joystick Right	None
Move Joystick Up	None
Move Joystick Down	None
Enter 95; Hold the PRESET key (approximately five seconds) until the main menu appears on the screen.	Accessing OSD Main Menu

OSD Setup Menu Mode

PELCO Keyboard	Camera Function
OPEN	Sub Menu Enter
CLOSE	Sub Menu Exit
NEAR	Cursor Up
FAR	Cursor Down
Move Joystick Left	Decrease (-)
Move Joystick Right	Increase (+)
Move Joystick Up	Cursor Up
Move Joystick Down	Cursor Down
Twist Joystick clockwise or Zoom In	None
Twist Joystick counterclockwise or Zoom Out	None

Please refer to PELCO Keyboard (or compatible) manual for more information.

8. SYSTEM SETUP

8.1 OSD (On Screen Display) Main Menu Description

Main Menu Display

MAIN MENU VER.xxxx	
EXPOSURE	↔
BLC	↔
DAY/NIGHT	↔
WHITE BALANCE	↔
PRIVACY MASK	↔
EFFECT	↔
DISPLAY	↔
COMMUNICATION	↔
DEFAULT	ON
EXIT	↔

Main Menu Setup

- In order to display the setup menu on the screen, set the menu command or press the button panel.
- Use ▲/ ▼ control buttons to select each item.
- Use ◀(-)/ ▶(+) control buttons to change the data.
- Use MENU control button to ENTER/ EXIT the menu display.

8.2 Sub Menu Description

Exposure Setup

EXPOSURE	
LENS TYPE	DC/ VIDEO
BRIGHTNESS	30
AGC MODE	AUTO
AGC MAX	100
AGC ADJ	NA
FLICKERLESS	OFF
SHUTTER SPD	NORMAL
DEFAULT	ON
RETURN	←→

Note:

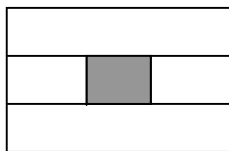
1. Lens type can be switched to DC/ VIDEO or MANUAL. When the system is set to DC/ VIDEO, please put the switch (situated on the back of the camera) in “DC” or “VIDEO” position respectively according to the type of the lens used (Different lens types used will influence the image brightness, please adjust according to actual condition.).
2. Brightness setup range: 0~36.
3. AGC MODE: AUTO/ MANUAL selectable.
 - (1) AGC MAX: Set AGC MODE to AUTO (AGC MAX setup range = 0~255).
When AGC MAX < 100 is setup, AE function of Day/ Night Mode becomes an ineffective function (data value “—” for D/N Mode will be shown on the display).
Set to MANUAL, AGC MAX becomes an NA (Not Available) item.
 - (2) AGC ADJ: Set AGC MODE to AUTO, AGC ADJ becomes an NA (Not Available) item.
 - (3) AGC MODE: Set to MANUAL, AGC ADJ can be set to fixed GAIN value (0~255).
4. SHUTTER SPD mode (NTSC: 1/100 and PAL: 1/120) is fixed, when FLICKERLESS mode is set to “ON”.
5. Nine types of SHUTTER SPD Mode: AUTO, NORMAL (NTSC: 1/60 and PAL: 1/50), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, and 1/100000.
6. AGC MODE auto switches to manual, when SHUTTER SPD is set to 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/100000 or FLICKERLESS (set to “ON”).
7. DEFAULT: Return to the factory-default configuration.
8. RETURN: Return to previous page.

BLC Setup:

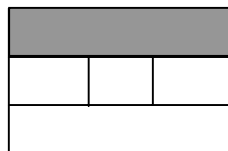
BLC	
BLC MODE	OFF
BLC LEVEL	15
BLC AREA	CENTER
DEFAULT	ON
RETURN	←→

Note:

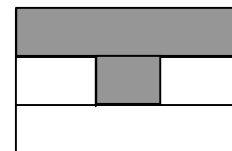
1. BLC MODE: BLC MODE can be set to “ON/ OFF”.
2. BLC LEVEL (1~15): The higher the value, the higher the backlight compensation level.
3. Seven Types of BLC AREA Mode:
(1) CENTER (2) TOPS (3) TOPL (4) BOTTOMS (5) BOTTOMML (6) LEFT (7) RIGHT



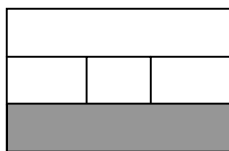
(1) CENTER



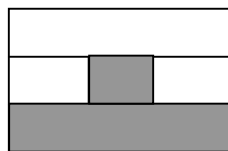
(2) TOPS



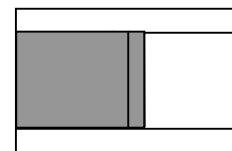
(3) TOPL



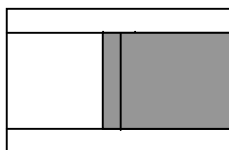
(4) BOTTOMS



(5) BOTTOMML



(6) LEFT



(7) RIGHT

DAY/ NIGHT Setup:

DAY/ NIGHT	
D/N MODE	AE
DAY→NIGHT	50
NIGHT→DAY	200
SENSOR LEVEL	NA
FILTER DELAY	NA
DEFAULT	ON
RETURN	←→
AE VALUE	???
SENSOR VALUE	???

Note:

- D/N MODE: Four types of setup (AE*/ SENSOR/ DAY/ NIGHT).
 - AE: Setup according to DAY NIGHT and NIGHT DAY (threshold value), auto switches to Color or B/ W. When AGC MAX < 100 is setup, AE function of Day/ Night Mode becomes an ineffective function (data value “---” for D/N Mode will be shown on the display).
 - SENSOR: Auto switches to Color or B/ W according to SENSOR LEVEL and FILTER DELAY setup.
 - DAY: Fixed to Color mode.
 - NIGHT: Fixed to B/ W mode.
- DAY NIGHT: The threshold value of color change (from color to B/ W) under AE mode. Switches to B/W when “Day Night” “AE Value”.
- NIGHT DAY: The threshold value of color change (from B/ W to color) under AE mode. Switches to Color when “Night Day” “AE Value”.
- SENSOR LEVEL
 - Higher the value: When the environment illumination is insufficient the process of switching to B/ W will be delayed.
 - Lower the value: When the environment illumination is insufficient advanced switching process from Color to B/ W will quickened.
- FILTER DELAY: The delay time of the system switching from color to B&W mode when environment illumination change occurs (Filter Delay Time: 0~15 Sec.).
- When D/N MODE is set to “AE/ DAY/ NIGHT” mode, SENSOR LEVEL and FILTER DELAY become an NA (Not Available) item.
- AE VALUE: When D/N is set to AE, it will reflect the illumination degree of the current scene.
SENSOR VALUE: When D/ N is set to SENSOR, it will reflect the illumination degree of the current scene.
- The table shown below are reference values, please setup according to the current scene.

CCD Type	Lens Type	Shutter Speed	BLC	DAY NIGHT	NIGHT DAY
EX-View	DC Drive Video Drive Manual IRIS	Normal	On / Off	50	200
Non EX-View	DC drive		On / Off	50	200
	Video drive		On / Off	50	150
	Manual drive		On / Off	50	180
EX-View Non EX-View	Manual IRIS	Auto	On	20	100
			Off	20	110

WHITE BALANCE Setup:

WHITE BALANCE	
WB MODE	AUTO
RED GAIN	NA
BLUE GAIN	NA
PUSH AUTO	NA
DEFAULT	ON
RETURN	←→

Note:

1. Five Types of WB MODE: AUTO, INDOOR, OUTDOOR, MANUAL, and PUSH AUTO.
2. RED GAIN/BLUE GAIN operates only when WB MODE is set to MANUAL, otherwise it is an NA (Not Available) item.
3. When WB MODE is set to PUSH AUTO:
 - PUSH AUTO ON: Enable auto tracing white balance.
 - PUSH AUTO OFF: Disable auto tracing white balance.

PRIVACY MASK Setup:

PRIVACY MASK	
AREA	1
MASK	OFF
START X	50
END X	100
START Y	30
END Y	40
DEFAULT	ON
RETURN	←→

Note:

1. AREA: PRIVACY MASK (Maximum 8 mask area setups).
2. MASK: Select "ON/ OFF" to enable or disable mask area.
3. START X: Horizontal start position (2~225).
4. END X: Horizontal end position (2~225).
5. START Y: Vertical start position (0~225).
6. END Y: Vertical end position (0~225).

EFFECT Setup:

EFFECT	
SHARPNESS	10
POSI/NEGA	POSI
MIRROR	OFF
SYNC	INT
V PHASE	NA
DEFAULT	ON
RETURN	←→

Note:

1. SHARPNESS: Video sharpness level setup (0 ~15).
2. POSI/ NEGA: Images can be set to POSI (Positive Image) or NEGA (Negative Image).
3. Two Types of MIRROR Mode: OFF/ ON (HORIZONTAL).
4. SYNC: When using a DC 12V adaptor, the sync setting is set to internal sync.
5. V PHASE: When L/L mode is selected, you can adjust the desired phase (0 ~ 358), otherwise it is an NA (Not Available) item.

DISPLAY Setup:

DISPLAY	
TITLE	
TITLE DISP	ON
TITLE POS	LEFT DOWN
ID DISP	ON
ID POS	RIGHT DOWN
DEFAULT	ON
RETURN	↔

Note:

1. TITLE :You can enter up to 16 characters.
2. TITLE/ ID DISP: Set to ON to display or OFF not to display.
3. TITLE/ ID POS (Four ID Setup Positions):
RIGHT DOWN/ LEFT UP/ RIGHT UP/ LEFT DOWN.

COMMUNICATION Setup:

COMMUNICATION	
CAMERA ID	1
PROTOCOL	AUTO
SPEED	9600
PARITY	NONE
RETURN	↔

Note:

1. Please refer to “6. INSTALLATION” for more information on Communication.

9. CAMERA CONTROL PROTOCOL

Native Protocol Format

Interface Type: RS485

Version: 1.02

Command Packet	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
	Receiver ID	Transmitter ID	OP Code	Data 0	Data 1	Check Sum

Definitions: (in Hexadecimal)

Keyboard ID: XX

Camera ID: YY

Check Sum: ZZ (Byte1 xor Byte2 xor Byte3 xor Byte4 xor Byte5).

Note: "xor" means Exclusive OR.

Event	Keyboard Send	Camera Response	Remarks
Linking	step1.01 XX 00 00 00 ZZ step2.02 XX 00 00 00 ZZ step3.03 XX 00 00 00 ZZ step128.80 XX 00 00 00 ZZ	XX YY 00 00 00 ZZ	The camera will respond at once after keyboard sent correct device ID.
Button NUM+"ENTER" or "CH+" or "CH-"	step1.YY XX 4A 00 00 ZZ step3.YY XX 01 00 00 ZZ	step2.XX YY 4A 00 ## ZZ step4.XX YY 01 && \$\$ ZZ	"##": Device Type "\$": Device State
Button "BRIGHTNESS +"	step1.YY XX 23 02 00 ZZ step3.YY XX 23 05 00 ZZ	step2.XX YY 23 02 00 ZZ step4.XX YY 23 05 00 ZZ	
Button "BRIGHTNESS -"	step1.YY XX 23 03 00 ZZ step3.YY XX 23 05 00 ZZ	step2.XX YY 23 03 00 ZZ step4.XX YY 23 05 00 ZZ	
Button "ZOOM TELE"	step1.YY XX 24 01 00 ZZ step3.YY XX 24 04 00 ZZ	step2.XX YY 24 01 00 ZZ step4.XX YY 24 04 00 ZZ	
Button "ZOOM WIDE"	step1.YY XX 24 00 00 ZZ step3.YY XX 24 04 00 ZZ	step2.XX YY 24 00 00 ZZ step4.XX YY 24 04 00 ZZ	
Button "MENU" for call OSD	step1.YY XX 10 00 00 ZZ step3.YY XX 28 04 00 ZZ step5.YY XX 28 FF 00 ZZ	step1.YY XX 10 00 00 ZZ step3.YY XX 28 04 00 ZZ step5.YY XX 28 FF 00 ZZ	OSD MODE
OSD MODE Button "▶"	step1.YY XX 28 03 00 ZZ step3.YY XX 28 FF 00 ZZ	step2.XX YY 28 03 00 ZZ step4.XX YY 28 FF 00 ZZ	OSD MODE
OSD MODE Button "◀"	step1.YY XX 28 02 00 ZZ step3.YY XX 28 FF 00 ZZ	step2.XX YY 28 02 00 ZZ step4.XX YY 28 FF 00 ZZ	OSD MODE
OSD MODE Button " "	step1.YY XX 28 00 00 ZZ step3.YY XX 28 FF 00 ZZ	step2.XX YY 28 00 00 ZZ step4.XX YY 28 FF 00 ZZ	OSD MODE
OSD MODE Button " "	step1.YY XX 28 01 00 ZZ step3.YY XX 28 FF 00 ZZ	step2.XX YY 28 01 00 ZZ step4.XX YY 28 FF 00 ZZ	OSD MODE
OSD MODE Button "ENTER"	step1.YY XX 10 00 00 ZZ step3.YY XX 28 06 00 ZZ	step2.XX YY 10 20 03 ZZ step4.XX YY 28 06 ** ZZ	"**": 11 OSD off 00 OSD on
OSD MODE Button "ESC"	step1.YY XX 10 00 00 ZZ step3.YY XX 28 05 00 ZZ	step2.XX YY 10 20 03 ZZ step4.XX YY 28 05 ** ZZ	"**": 11 OSD off 00 OSD on

DEVICE TYPE	##
CAMERA	00
RECEIVER BOX	01

DEVICE STATE	\$\$
RESERVED	BIT0
RESERVED	BIT1
RESERVED	BIT2
OSD MENU	BIT3
RESERVED	BIT4
RESERVED	BIT5
RESERVED	BIT6
RESERVED	BIT7

Examples:

To control the camera device (address = 1) via keyboard (address = F0), the command string (in Hexadecimal) would be:

Brightness + Command

Keyboard: 01 F0 23 02 00 D0

Device: F0 01 23 02 00 D0

Brightness Stop Command

Keyboard: 01 F0 23 05 00 D7

Device: F0 01 23 05 00 D7

Brightness - Command

Keyboard: 01 F0 23 03 00 D1

Device: F0 01 23 03 00 D1

Brightness Stop Command

Keyboard: 01 F0 23 05 00 D7

Device: F0 01 23 05 00 D7

OSD Menu Command

Keyboard: 01 F0 28 04 00 DD

Device: F0 01 28 04 00 DD

OSD Menu Exit Command

Keyboard: 01 F0 28 05 00 DC

Device: F0 01 28 05 11 CD

OSD Menu Enter Command

Keyboard: 01 F0 28 06 00 DF

Device: F0 01 28 06 00 DF

10. SPECIFICATION

Image Device	1/3" Color Sony Solid State Image Device CCD	
A/ D (Analog to Digital) Converter	10 bits	
Effective Picture Elements	NTSC: 768 x 494 (H x V)/ PAL: 752 x 582 (H x V)	
Horizontal Resolution	550 TV lines	
Minimum Illumination	HR_EX 0.01Lux (Day & Night on), 0.5Lux (Color) / F2.0 HR 0.05Lux (Day & Night on), 0.8Lux (Color) / F2.0	
S/N Ratio	More than 48 dB (AGC OFF)	
Shutter Speed Control	Auto: NTSC 1/60~1/100,000s, PAL1/50~1/100,000s Normal: 1/60(N), 1/50(P) Manual: 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/100000	
Scanning System	NTSC: 525 lines/ PAL: 625 lines	
Flickerless Mode	ON/ OFF	
Auto Iris Control	Video/ DC Driver	
Gain Control	Auto/ Manual	
White Balance	Auto/ Indoor/ Outdoor/ Manual/ Push Auto	
Back Light Compensation	ON/ OFF (1~15 adjustable), 7 types selectable	
Day & Night (ICR)	AE/ Sensor/ Day/ Night	
Camera ID	000 ~ 255	
Camera Title	Up to 16 Characters	
Mirror	ON/ OFF	
Positive/ Negative	ON/OFF	
Video Output	1Vp-p/ 75 Ohms	
Remote Control	RS422/ RS485 (RS232 optional)	
Power Supply	AC 24V/ DC 12V	AC 100~240V
Power Consumption	<4.1W	<4.9W
Gamma Characteristic	0.45	
Synchronous System	INT/ LL	
Operating Temperature	-10 ~ 50 (14 ~ 122)	
Storage Temperature	-20 ~ 60 (-4 ~ 140)	
Operating Humidity	0% RH ~ 70 % RH	
Storage Humidity	0% RH ~ 85 % RH	
Dimensions (WxHxD)	66 mm x 52 mm x 146mm	
Weight	AC 24V/ DC 12V: 0.54 Kg	AC 100~240V: 0.57 Kg

(Note: Design and specifications are subject to change without prior notice.)

MEMO