



**WDR Super High Resolution Day &  
Night Color Camera  
1/3" DOUBLE SCAN CCD HIGH  
RESOLUTION**



**USER'S MANUAL**

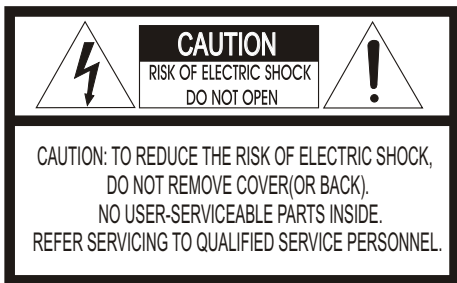
## **LIMITATION OF LIABILITY**

THE INFORMATION IN THIS PUBLICATION IS BELIEVED TO BE ACCURATE IN ALL RESPECTS, HOWEVER, WE CANNOT ASSUME RESPONSIBILITY FOR ANY CONSEQUENCES RESULTING FROM THE USE THEREOF. THE INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE WITHOUT NOTICE. REVISIONS OR NEW EDITIONS TO THIS PUBLICATION MAY BE ISSUED TO INCORPORATE SUCH CHANGES.

## WARNINGS AND CAUTIONS:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECTS THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.

### CAUTION:



## EXPLANATION OF GRAPHICAL SYMBOLS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

## PRECAUTIONS

### Safety -----

Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by the qualified personnel before operating it any further.

Unplug the unit from the wall outlet if it is not going to be used for several days or more. To disconnect the cord, pull it out by the plug. Never pull the cord itself.

Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation holes.

Height and vertical linearity controls located at the rear panel are for special adjustments by qualified personnel only.

### Installation -----

Do not install the unit in an extremely hot or humid place or in a place subject to excessive dust, mechanical vibration.

The unit is not designed to be waterproof. Exposure to rain or water may damage the unit.

### Cleaning -----

Clean the unit with a slightly damp soft cloth. Use a mild household detergent. Never use strong solvents such as thinner or benzene as they might damage the finish of the unit.

Retain the original carton and packing materials for safe transport of this unit in the future.

## FCC COMPLIANCE STATEMENT

**FCC INFORMATION :** THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

**CAUTION :** CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

THIS CLASS A DIGITAL APPARATUS COMPLIES WITH CANADIAN ICES-003.

CET APPAREIL NUMÉRIQUE DE LA CLASSE A EST CONFORME À LA NORME NMB-003 DU CANADA.

## CE COMPLIANCE STATEMENT

### **WARNING**

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

# IMPORTANT SAFEGUARDS

---

## 1. READ AND RETAIN INSTRUCTIONS

Read the instruction manual before operating the equipment. Retain the manual for future reference.

## 2. CLEANING

Turn the unit off and unplug from the power outlet before cleaning. Use a damp cloth for cleaning. Do not use harsh cleansers or aerosol cleaners.

## 3. ATTACHMENTS

Do not use attachments unless recommended by manufacturer as they may affect the functionality of the unit and result in the risk of fire, electric shock or injury.

## 4. MOISTURE

Do not use equipment near water or other liquids.

## 5. ACCESSORIES

Equipment should be installed in a safe, stable location. Any wall or shelf mounting accessory equipment should be installed using the manufacturer's instructions. Care should be used when moving heavy equipment. Quick stops, excessive force, and uneven surfaces may cause the equipment to fall causing serious injury to persons and objects.

## 6. VENTILATION

Openings in the equipment, if any, are provided for ventilation to ensure reliable operation of the unit and to protect it from overheating. These openings must not be blocked or covered.

## 7. POWER SOURCES

The equipment should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied at the installation location, contact your dealer. For equipment designed to operate from battery power, refer to the operating instructions.

## 8. GROUNDING OR POLARIZATION

Equipment that is powered through a polarized plug (a plug with one blade wider than the other) will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. Do not defeat the safety purpose of the polarized plug.

**Alternate Warning:** If the equipment is powered through a three-way grounding-type plug, a plug having a third (grounding) pin, the plug will only fit into a grounding-type power outlet. This is a safety feature. Do not defeat the safety purpose of the grounding-type plug. If your outlet does not have the grounding plug receptacle, contact your local electrician.

## 9. CORD AND CABLE PROTECTION

Route power cords and cables in a manner to protect them from damage by being walked on or pinched by items placed upon or against them.

## 10. LIGHTNING

For protection of the equipment during a lightning storm or when it is left unattended and unused for long periods of time, unplug the unit from the wall outlet. Disconnect any antennas or cable systems that may be connected to the equipment. This will prevent damage to the equipment due to lightning or power-line surges.

## 11. OVERLOADING

Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

## 12. SERVICING

Do not attempt to service the video monitor or equipment yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

## 13. DAMAGE REQUIRING SERVICE

Unplug the equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power supply cord or the plug has been damaged.
- If liquid has spilled or objects have fallen into the unit.
- If the equipment has been exposed to water or other liquids.
- If the equipment does not operate normally by following the operating instructions, adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage to the unit.
- If the equipment has been dropped or the casing damaged.
- When the equipment exhibits a distinct change in performance.

## 14. REPLACEMENT PARTS

When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

## 15. SAFETY CHECK

Upon completion of any service or repairs to the equipment, ask the service technician to perform safety checks to verify that the equipment is in proper operating condition.

## 16. FIELD INSTALLATION

The installation of equipment should be made by a qualified service person and should conform to all local codes.

**17. CAUTION - THESE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED SERVICE PERSONNEL ONLY. TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.**

**18. Use certified/Listed Class 2 power supply transformer only.**

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# INTRODUCTION

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The camera provides high-quality images using SONY Wide Dynamic 1/3" CCD and digital signal processing LSIs.

## Features:

- 1/3" Super HAD Double Scan CCD for an image of high sensitivity
- Wide Dynamic Range(WDR)
- Excellent picture quality
- 580 lines(Color), 680 lines(B/W) of resolution
- 0.5 Lux(Color), 0.04 Lux(B/W), 0.001Lux(Low-shutter)@ F1.2 Sensitivity
- C/CS, backfocus cam for easy adjustment
- Auto electronic shutter [1/60(1/50) ~ 1/100,000] and manual electronic shutter modes
- OSD (On Screen Display)
- Auto and manual white balance modes
- Selectable BLC Zone
- Day&Night (Auto/Manual, FILTER DLY)
- Privacy Zone 16point, Motion Detection 4 Point
- SHARPNESS, D-ZOOM, NEGA/POSI, MIRROR, V FLIP, ROTATION, FREEZE
- AGC (Auto Gain Control)
- VIDEO OUT(BNC, UTP)
- RS485 CONTROL
- Internal/AC line lock
- Compatible with video- or DC-type lenses with OSD select
- Quick connect for video or DC lens with 4-pin connector
- Operates in 12VDC or 24VAC
- Operates in 100-240VAC
- Use Certified / Listed Class 2 power supply only.
- One year warranty

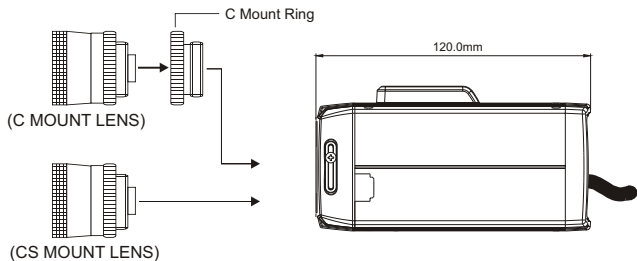


**IMPORTANT :** The user of this camera is responsible for checking and complying with local, state, and federal laws and statutes concerning the recording and monitoring of audio signals.

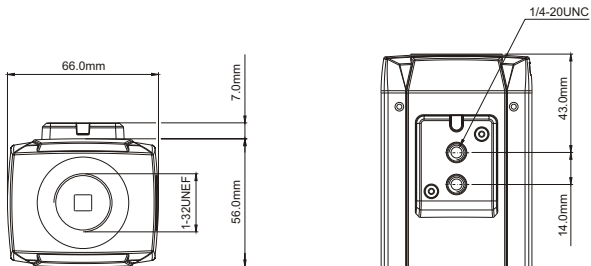
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# CAMERA OVERVIEW

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## SIDE VIEW



FRONT VIEW

TOP VIEW

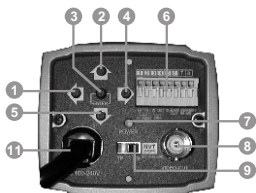
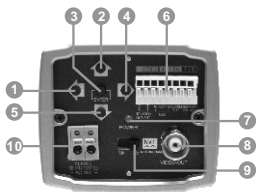
# FUNCTION DESCRIPTION

## - SIDE VIEW



- ① Focus Adjusting Fixing Screw
- ② Auto Iris Lens Connector

## - REAR VIEW

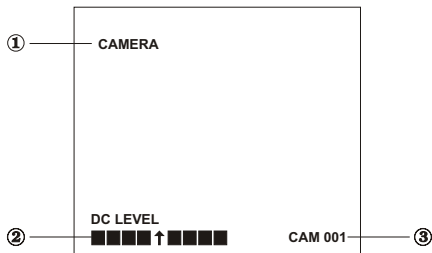


- ① Left Button
  - ② Up Button
  - ③ Enter Button
  - ④ Right Button
  - ⑤ Down Button
  - ⑥ UTP Video Output  
Day / Night External I/O  
ALARM OUT  
RS - 485
  - ⑦ Power Indicator
  - ⑧ Video Out Connector (BNC)
  - ⑨ UTP or BNC Transformation Switch
  - ⑩ AC/DC Compatible Input Terminal
  - ⑪ AC power Cord
- } Terminal Block

# CAMERA ADJUSTMENT

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## OSD MAIN SCREEN



- ① Camera title.
- ② Status of the dc level.
- ③ Camera ID.

## <MAIN MENU>

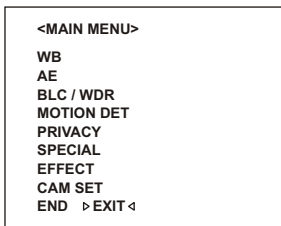


FIGURE 1. MAIN MENU TABLE

## <WB>

Press the MENU button to access the "WB" mode.

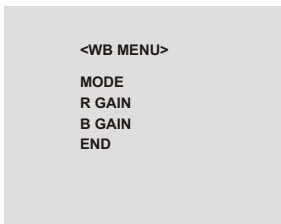


FIGURE 2. WB TABLE

### 1) MODE

- AWB Set the color temperature 2500°K to 9500°K
- WAWB Wide range auto white balance mode.
- INDOOR Set the color temperature to 3200°K
- OUTDOOR Set the color temperature to 6300°K
- MANUAL Manual mode. User can change R and B Gain manually.

### 2) R GAIN

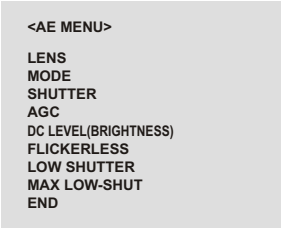
Adjust R-GAIN value.(0~255)  
Can be adjusted while in manual mode.

### 3) B GAIN

Adjust R-GAIN value.(0~255)  
Can be adjusted while in manual mode.

## <AE>

Press the MENU button to access the "AE" mode.



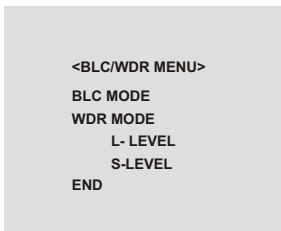
```
<AE MENU>
LENS
MODE
SHUTTER
AGC
DC LEVEL(BRIGHTNESS)
FLICKERLESS
LOW SHUTTER
MAX LOW-SHUT
END
```

**FIGURE 3. AE TABLE**

- |                                 |   |
|---------------------------------|---|
| <b>1) LENS</b>                  | DC, Video, Manual Lens selected.  |
| <b>2) MODE</b>                  |   |
| - AUTO                          | Auto Exposure mode.   |
| - SHUTTER                       | Manual Shutter mode.  |
| <b>3) SHUTTER</b>               | Select the shutter mode.(1/60(50) ~ 1/100,000 sec)<br>Can be changed while in shutter mode. |
| <b>4) AGC</b>                   | Auto gain control ON/OFF  |
| <b>5) DC LEVEL / BRIGHTNESS</b> |   |
| - DC LEVEL                      | Adjust DC level (0 ~ 255)<br>Can be adjusted while in dc lens mode.                         |
| - BRIGHTNESS                    | Adjust BRIGHTNESS level (0 ~ 255)<br>Can be adjusted while in manual lens mode.             |
| <b>6) FLICKERLESS</b>           | Removes screen flickering caused by discordance of frequency and lighting.                  |
| <b>7) LOW SHUTTER</b>           | Use under very low light condition for full color surveillance.                             |
| <b>8) MAX LOW-SHUT</b>          | Select maximum Low-Shutter value. (x2 ~ x256)   |

## <BLC/WDR>

Press the MENU button to access the "BLC/WDR" mode.

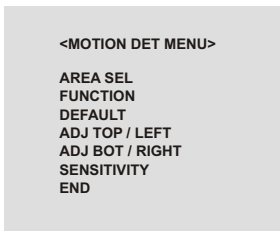


**FIGURE 4. BLC/WDR TABLE**

- |                    |  |
|--------------------|--|
| 1) <b>BLC MODE</b> | Sharpens subjects with backlight.<br>(OFF / CENTER / TOP / BOTTOM / RIGHT / LEFT ) |
| 2) <b>WDR MODE</b> | Wide dynamic range ON/OFF  |
| <b>L- LEVEL</b>    | Can be adjust long-time WDR level (0~200)  |
| <b>S- LEVEL</b>    | Can be adjust short-time WDR level (0~200)   |

## <MOTION DET>

Press the MENU button to access the "MOTION DET" mode.

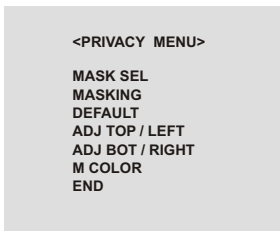


**FIGURE 5. MOTION DET**

- |                         |  |
|-------------------------|--|
| <b>1) AREA SEL</b>      | Select MD area number.   |
| <b>2) FUNCTION</b>      | Select MD ON/OFF   |
| <b>3) DEFAULT</b>       | Set MD area as default.  |
| <b>4) ADJ TOP/LEFT</b>  | Adjust the location of the MD area with boundary TOP and LEFT.(MD 1~4)     |
| <b>5) ADJ BOT/RIGHT</b> | Adjust the location of the MD area with boundary BOTTOM and RIGHT.(MD 1~4) |
| <b>6) SENSITIVITY</b>   | Adjust sensitivity of MD area.(1~255)                                      |

## <PRIVACY>

Press the MENU button to access the "PRIVACY" mode.

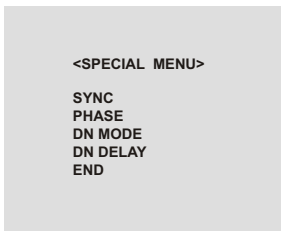


**FIGURE 6. PRIVACY TABLE**

- |                         |  |
|-------------------------|--|
| <b>1) MASK SEL</b>      | Select MASK area number.   |
| <b>2) MASKING</b>       | Select MASK ON/OFF   |
| <b>3) DEFAULT</b>       | Set MASK area as default.  |
| <b>4) ADJ TOP/LEFT</b>  | Adjust the location of the MASK area with boundary TOP and LEFT.(MASK 1~16)      |
| <b>5) ADJ BOT/RIGHT</b> | Adjust the location of the MASK area with boundary BOTTOM and RIGHT. (MASK 1~16) |
| <b>6) M COLOR</b>       | Select MASK color. (WHITE/GRAY/BLACK)  |

## <SPECIAL>

Press the MENU button to access the "SPECIAL" mode.

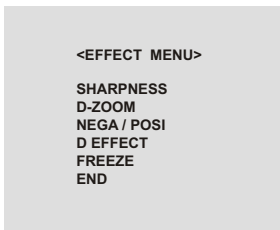


**FIGURE 7. SPECIAL TABLE**

- |   |   |
|---|---|
| <b>1) SYNC</b><br>- INT<br><br>-L/L                         | Select Internal or Line Lock mode.<br>This mode is necessary for using the internal synchronization.<br><br>This mode is necessary for the operation of multi camera because it synchronizes the camera phase by using the external signal (AC Signal).   |
| <b>2) PHASE</b>   | Sync phase is adjustable in line lock mode.   |
| <b>3) DN MODE</b><br>-AUTO<br>-COLOR<br><br>-BW<br><br>-EXT | Filter operates automatically according to brightness.<br>The camera outputs the video image only in color.<br><br>The camera outputs the video image only in black and white.<br><br>This menu automatically converts the COLOR Mode into the BW Mode or vice versa depending on illumination with an external sensor. |
| <b>4) DN DELAY</b>  | Adjust the working time of the filter when D&N operated.<br>(05sec / 10sec / 20sec)   |

## <EFFECT>

Press the MENU button to access the "EFFECT" mode.

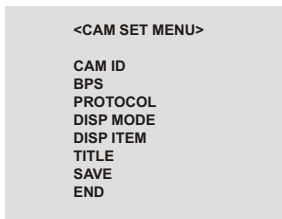


**FIGURE 8. EFFECT TABLE**

- |                       |  |
|-----------------------|--|
| <b>1) SHARPNESS</b>   | Can be adjusted SHARPNESS of outlines.(0~15)                                   |
| <b>2) D-ZOOM</b>      | Digital Zoom ON / OFF  |
| <b>3) NEGA / POSI</b> | Select the negative or positive mode.  |
| <b>4) D EFFECT</b>    | Reverse the screen in 3 modes selection.<br>(OFF / MIRROR / V FLIP / ROTATION) |
| <b>5) FREEZE</b>      | Select the real or still mode.   |

## <CAM SET>

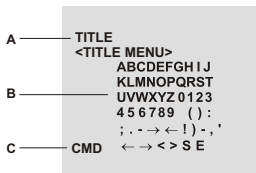
Press the MENU button to access the "CAM SET" mode.



**FIGURE 9. CAM SET TABLE**

- |                     |  |
|---------------------|--|
| <b>1) CAM ID</b>    | Select the camera ID. (001 ~ 255)  |
| <b>2) BPS</b>       | Select serial communication speed.<br>(2400 / 4800 / 9600 / 19200)   |
| <b>3) PROTOCOL</b>  | Select operating protocol.<br>COMMAND : Camera controlled by RS-232C command.<br>FASTRAX : Fastrax protocol.<br>PELCO-D : Pelco-D protocol.<br>PELCO-P : Pelco-P protocol. |
| <b>4) DISP MODE</b> | On screen display is ON/OFF  |
| <b>5) DISP ITEM</b> |  |
| -DISP0              | Display title and camera ID.   |
| -DISP1              | Display title, camera ID and DC Level  |

### 6) TITLE



#### A. TITLE

#### B. Character Table

#### C. Command Line

- ← : Move to left
- : Move to right
- < : Erase a left character
- > : Erase a right character
- S : Save title
- E : End

### 7) SAVE

Save preset parameters of CAM SET MENU.

## <END>

Press the MENU button to access the "END" mode.

- 1) **DEFAULT & EXIT** Set parameters as factory setting and terminate the MAIN MENU.
- 2) **SAVE & EXIT** Save the changed preset parameter and terminate the MAIN MENU.
- 3) **EXIT** Terminate the MAIN MENU without saving parameters.

# CONTROL AND CONNECTIONS/DAY&NIGHT I/O / ALARM OUT TERMINALS

1	2	3	4	5	6	7	8
TP VIDEO OUTPUT		D&N I/O		COM	ALARM	RS-485	
⊖	⊕	IN	OUT	GND	OUT	RS 485+(RX)	RS 485-(TX)

## 1) CAMERA CONTROL

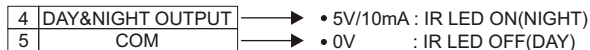
- 7 PIN : RS 485+
- 8 PIN : RS 485-

## 2) DAY&NIGHT I/O Terminals

To select Day/Night mode using external equipment, connect control lines to the appropriate terminals.

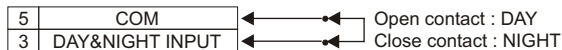
### • DAY&NIGHT OUTPUT (4pin)

It is the function that can turn on external IR LED Lamp by detecting the sensitivity on the AGC level when the D&N mode is set "AUTO" on the OSD menu of the camera.



### • DAY&NIGHT EXTERNAL INPUT (3pin)

It is the function that can be switched to DAY Mode or NIGHT Mode by receiving the D&N on/off signal from external light sensor or IR LED LAMP. When D&N Mode is set "External" on the OSD menu of the camera.



## 3) ALARM OUT (6pin)

Motion detection signals are output through this port.  
(Open collector, On GND)

#### 4) POWER INPUT TERMINAL



CLASS 2  
+ DC 12V -  
~ AC 24V ~

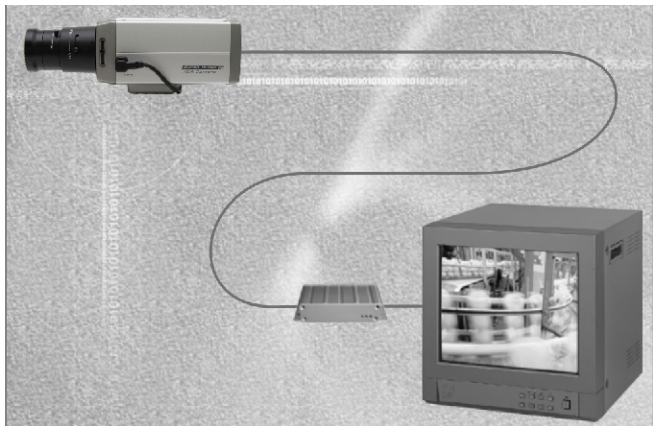


AC 100-240V

- This terminal accepts a DC12V or AC24V power source from a DC12V or AC24V ac +/-10% 60/50Hz +/- 1Hz.
- Use Certified/Listed Class 2 power supply only.
- In DC power, use the Adapter mode than DC 12V 500mA Capacity.
- AC Power Cord - This power cord accepts a 100-240V ~ 50Hz +/- 1Hz

#### 5) VIDEO OUT CONNECTOR

- **BNC** : This BNC connector provides a 1.0Vp-p/75 ohms composite video Signal.
- **UTP** : Unshielded Twisted Pair video Transmission for effective installation.  
1PIN : TP VIDEO OUTPUT ⊖  
2PIN : TP VIDEO OUTPUT ⊕



## **CONTENTS OF PACKAGE**

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Installation of the camera must be performed by qualified service personnel in accordance with all local and national electrical and mechanical codes.

Carefully remove the color camera and its accessories from the carton and verify that they were not damaged in shipment.

The contents of the package includes:

1. Color CCD camera
2. Mini-DIN connector (for video-or dc-type auto-iris lens)
3. CS adapter ring for C mounting "C" lenses
4. This manual

# LENS

The lens is not supplied with this camera. Purchase a lens suitable for your environment. This camera accepts the auto iris lens and both C-and CS-mount lens.

## \* Notes \*

- For using main functions it is recommended to use Auto Iris Lens with DC type.
- If the lens is marked with fingerprints other marks, the image quality might be poor.
- It is recommended to use a high quality lens to improve the image quality under low illumination.

## <INSTALLING AUTO IRIS LENS>

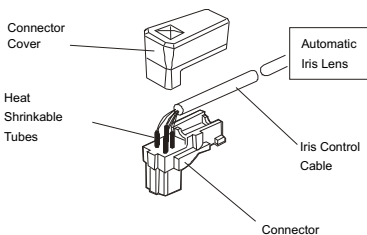
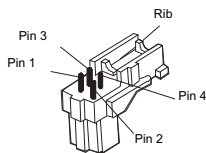
1. Remove the cover from the iris lens plug supplied, and solder the lens cable to the plug as shown below.

### • Video type :

- Pin 1 --- Red (Power source)
- Pin 2 --- N.C
- Pin 3 --- White (Video signal)
- Pin 4 --- Black (GND)

### • DC type :

- Pin 1 --- Damping-
- Pin 2 --- Damping+
- Pin 3 --- Drive+
- Pin 4 --- Drive-



2. Remove the protective cap, and attach the lens to the camera by turning clockwise.

3. Connect the lens plug to the auto iris connector on the right side of the camera.



4. The "DC" or "VIDEO" lens mode should be selected at the OSD AE menu.

## **BACK FOCUS ADJUSTMENT**

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For best results, perform back focus adjustments at night or while using a #6 or #8 welder's glass in front of the lens. The focus of the camera will change slightly if the camera iris was adjusted on a light scene, then changes to a dark scene. However, the camera will remain in focus if the iris was focused on a dark scene and the scene lightens.

1. The lens should be mounted on the camera before applying power.
2. If a picture is visible, focus on the picture. If the picture is not visible, open the iris on the lens. Open the lens as wide as possible by placing the welder's glass in front of the lens and forcing the lens to automatically open.
3. When the iris is open to the widest point, re-adjust the focus for clear picture. If a clear picture is not possible, set the focus ring to midrange.
4. Loosen the back focus lock screw.
5. Adjust the back focus ring for a clear picture.
6. Tighten the back focus lock screw.
7. Fine tune the focus with the focus ring on the lens.
8. Remove the welder's glass from in front of the lens.
9. Adjust the iris of the lens for the best picture quality.

## **ZOOM LENS BACK FOCUS ADJUSTMENT**

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The objective of back focusing a zoom lens is similar to that of a fixed focal length camera except the back focus is also adjusted to maintain the focus when "zooming" the lens in and out on a scene.

1. Choose an object at the farthest range set for viewing with a zoom lens.
2. Make sure the iris of the lens is wide open. Do this by adjusting the camera at night or use a welders glass in front of the lens.
3. Adjust the focus to the stop on the far range.
4. Adjust the zoom on the lens to obtain the widest picture.
5. Loosen the back focus lock screw.
6. Adjust the back focus ring for the clearest picture.
7. Tighten the back focus lock screw.
8. Adjust the zoom on the lens to the far telephoto position.
9. Adjust the back focus ring for the clearest picture.
10. Adjust the zoom on the lens back to the widest picture.
11. Loosen the back focus screw.
12. Re-adjust the back focus for the clearest picture.
13. Tighten the back focus lock screw.
14. Repeat the previous steps as necessary to maintain a clear picture throughout the entire zoom range.

# **TROUBLESHOOTING AND MAINTENANCE**

## **TROUBLESHOOTING**

If problems occur, verify the installation of the camera with the instructions in this manual and with other operating equipment.

Isolate the problem to the specific piece of equipment in the system and refer to the equipment manual for further information.

<b>PROBLEM</b>	<b>AREA TO CHECK</b>
No Video	<ol style="list-style-type: none"><li>1. Verify power is applied to all pieces of the equipment in the system. The camera LED should be ON.</li><li>2. Verify that the video cables are connected correctly.</li><li>3. Verify that the lens cap has been removed from the Lens and the iris of the lens is open.</li></ol>
Video but no control	Power down the system for one minute then re-apply power.
Dark Video	<ol style="list-style-type: none"><li>1. Adjust iris.</li><li>2. Check A/I connections.</li></ol>

## **PREVENTIVE MAINTENANCE**

Preventive maintenance allows detection and correction of minor that faults before they become serious and cause equipment failure.

Every three-month, perform the following maintenance.

1. Inspect all connection cables for deterioration or other damage.
2. Clean components with a clean damp cloth.
3. Verify that all the mounting hardware is secure.

# SPECIFICATIONS

MODEL		HCB-G50D (NTSC)	HCB-H50D (PAL)	
Power	Power source	DC 12V / AC 24V $\pm$ 10%		
	Power consumption	7.0 Watts		
General	Image sensor	1/3" SONY Super-HAD Color CCD		
	Total number of pixels	811(H) x 508(V)	795(H) x 596(V)	
	Scanning system	2:1 interlace		
	Scanning frequency	15.734KHz(H) x 59.94Hz(V)	15.625KHz(H) x 50Hz(V)	
	Sync. system	Internal / Line lock		
	Electronic shutter	1/60 ~ 1/100,000 sec.	1/50 ~ 1/100,000 sec.	
	Resolution	580 TV Lines (COLOR), 680TV Lines (B/W)		
	Min. illumination	0.5 Lux (COLOR), 0.04 Lux (B/W), 0.001 lux (Low-shutter)		
	Video output	1.0 Vp-p (75 ohm, composite)		
	S/N Ratio	50dB (AGC OFF)		
	Camera Control	RS485(FastraxII, Pelco D, Pelco P), Tact switch		
	F U N C T I O N	White Balance	AWB / Indoor / Outdoor / Manual / WAWB	
		Auto Exposure	Auto / Manual Shutter / Flicker less	
		AGC Control	AUTO	
		Shutter Speed	1/60 ~ 1/100,000	1/50 ~ 1/100,000
		BLC	Top / Bottom / Center / Right / Left / Off	
		Title	A ~ Z / 0 ~ 9	
		Display	On / Off (DISP0 / DISP1)	
		CAM ID	001 ~ 255	
		BPS	2400 / 4800 / 9600 / 19200	
Brightness		0 ~255 steps		
Sharpness		0 ~15 steps		
Low Shutter		x2 ~ x256 (13steps)		
Effect		V-Flip, Rotation, Mirror, D&N, D-Zoom, Nega/Posi, B/W, Freeze, Privacy Zone, MD		
WDR	x128			
Connector & etc.	Power input	2-Pin Terminal block		
	Video output	BNC , UTP		
	Auto iris output	4-Pin mini din jack (standard connection)		
	Lens mount	C/CS mount (Selected through back focus)		
	Mounting hole	1/4"-20 UNC (top or bottom)		
	Operating temperature	-10°C ~ +50°C		
	Operating humidity	0 ~ 96% (non-condensing)		
	External dimension	66 (W) x 56 (H) x 120 (D)mm		
Weight	265g			

# SPECIFICATIONS

MODEL		HCB-H90D	
Power	Power source	100-240V ~50Hz $\pm$ 1Hz	
	Power consumption	7.0 Watts	
General	Image sensor	1/3" SONY DS CCD	
	Total number of pixels	795(H) x 596(V)	
	Scanning system	2:1 interlace	
	Scanning frequency	15.625KHz(H), 50Hz(V)	
	Sync. system	Internal / Line lock	
	Electronic shutter	1/50 ~ 1/100,000 sec.	
	Resolution	580 TV lines(COLOR), 680 TV lines(BW)	
	Min. illumination	0.5 lux (Color), 0.04 lux (B/W), 0.001 lux (Low-shutter)	
	Video output	1.0 Vp-p (75 ohm, composite)	
	S/N Ratio	50dB (AGC OFF)	
	Camera Control	RS485(FastraxII, Pelco D, Pelco P), Tact switch	
	F U N C T I O N	White Balance	AWB / Indoor / Outdoor / Manual / WAWB
		Auto Exposure	Auto / Manual Shutter / Flicker less
		AGC Control	AUTO
		Shutter Speed	1/50 ~ 1/100,000
		BLC	Top / Bottom / Center / Right / Left / Off
		Title	A ~ Z / 0 ~ 9
		Display	On / Off (DISP0 / DISP1)
		CAM ID	001 ~ 255
		BPS	2400 / 4800 / 9600 / 19200
Brightness		0 ~255 steps	
Sharpness		0 ~15 steps	
Low Shutter		x2 ~ x256 (13steps)	
Effect		V-Flip, Rotation, Mirror, D&N, D-Zoom, Nega/Posi, B/W, Freeze, Privacy Zone, MD	
WDR		x128	
Connector & etc.	Power input	2-Pin Terminal block	
	Video output	BNC , UTP	
	Auto iris output	4-Pin mini din jack (standard connection)	
	Lens mount	C/CS mount (Selected through back focus)	
	Mounting hole	1/4"-20 UNC (top or bottom)	
	Operating temperature	-10°C ~ +50°C	
	Operating humidity	0 ~ 96% (non-condensing)	
	External dimension	66 (W) x 56 (H) x 120 (D)mm	
Weight	450g		