

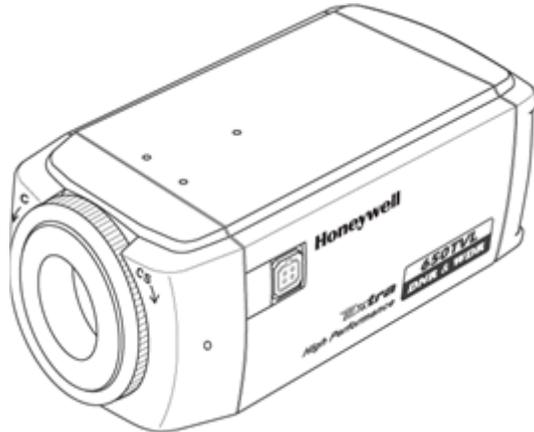
Honeywell

OPERATION MANUAL

WDR / DNR

High Resolution Color Camera

HCC-960/965 Series



READ AND KEEP THIS OPERATION MANUAL



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 appliance.

 CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN 	CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER(OR BACK). NO USER SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL
---	---

Explanation of Graphical Symbols.



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



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

Important Safety Instruction



1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, hear registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or ground plug: A polarized plug has two blades with one wider than the other. The wide blade is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plug, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. To Reduce The Risk Of Fire Or Electric Shock, Do Not Expose This Apparatus To Rain Or Moisture.
16. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, shall not be placed on the apparatus.



CAUTION FOR SAFE OPERATION

4

1. Water and Moisture

To prevent fire or shock hazard, do not expose this camera to rain or moisture.

2. Servicing

Do not attempt to disassemble or repair by yourself. You may be exposed to dangerous voltage or other hazards.

Note that all servicing is qualified service personnel. Modifications not approved by manufacturer could void the user's authority to operate the equipment.

3. Power Sources

To prevent electric shocks and risk of hazards, do NOT use more than the specified power source.

4. Environment

Do not install too warm or too cold place.
Recommended operation temperature is between -5°C and 50°C

5. Sunlight

Do not point the camera at the sun.
CCD can be damaged.

6. Heavy Shock and Vibration

Do not drop the camera or subject it to heavy shock of vibration.

7. Install on an Unstable Place

Do not place or install this camera on an unstable place, stand, tripod, bracket or table.
That may cause serious injury to people or damage to appliance.

8. When operation is incorrect or a malfunction is observed

While operating, if any abnormal condition (strange sound, smell or smoke) or a malfunction (no pictures, etc.) is observed, stop using the camera immediately, turn the power off, then contact your supplier.

9. Cleaning

Turn the power off and wipe off the dirt with a dry soft cloth. If it is extremely dirty, use furniture cleaner to wipe it off. To clean the lens, use a blower or lens cleaning tissue. (available from any camera dealer)

10. Do not shoot any source of bright light.

If the objects contain very bright areas, bright vertical or horizontal lines may appear on the screen. This is called "smear", a Phenomenon which often occurs with solid-state pickups, and is not a malfunction.

11. Damage Requiring service

Unplug the camera from the power source and refer servicing to qualified service personnel under the following condition:

- a. If the power-supply cord or plug is damaged.
- b. If the camera has been exposed to rain or water.
- c. If liquid has been spilled, or objects have fallen into the camera.
- d. If the camera does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the camera to its normal operation.
- e. If the camera has been dropped or the cabinet has been damaged.
- f. If the camera exhibits a distinct change in performance.
- g. Warranty is not covered in case of natural disaster or wrong Installation.

Contents

1. Features	6
2. Names & Functions	7
3. Installation	9
4. Remote Control Connection	11
5. On Screen Display	12
6. Specifications	20
7. Dimensions	22

Thank you for using this High Resolution Camera with WDR. To get the best efficiency, read carefully all instructions in this manual before use, and keep this manual for reference. If you have any problems with this camera, contact your supplier to service.

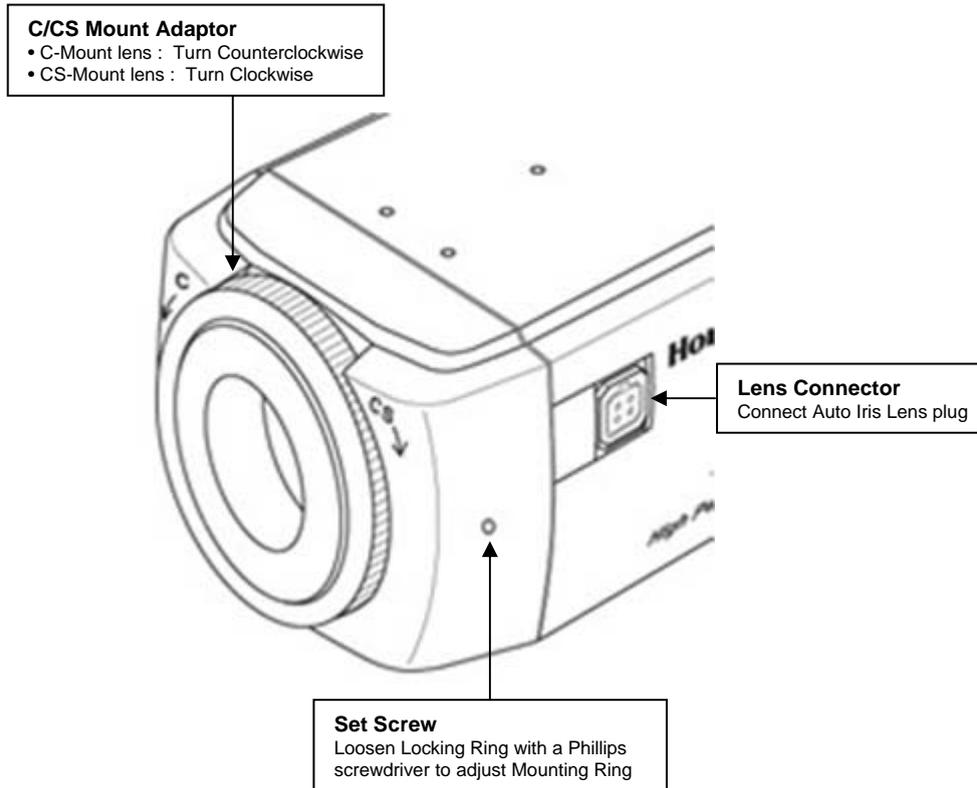
1. Features

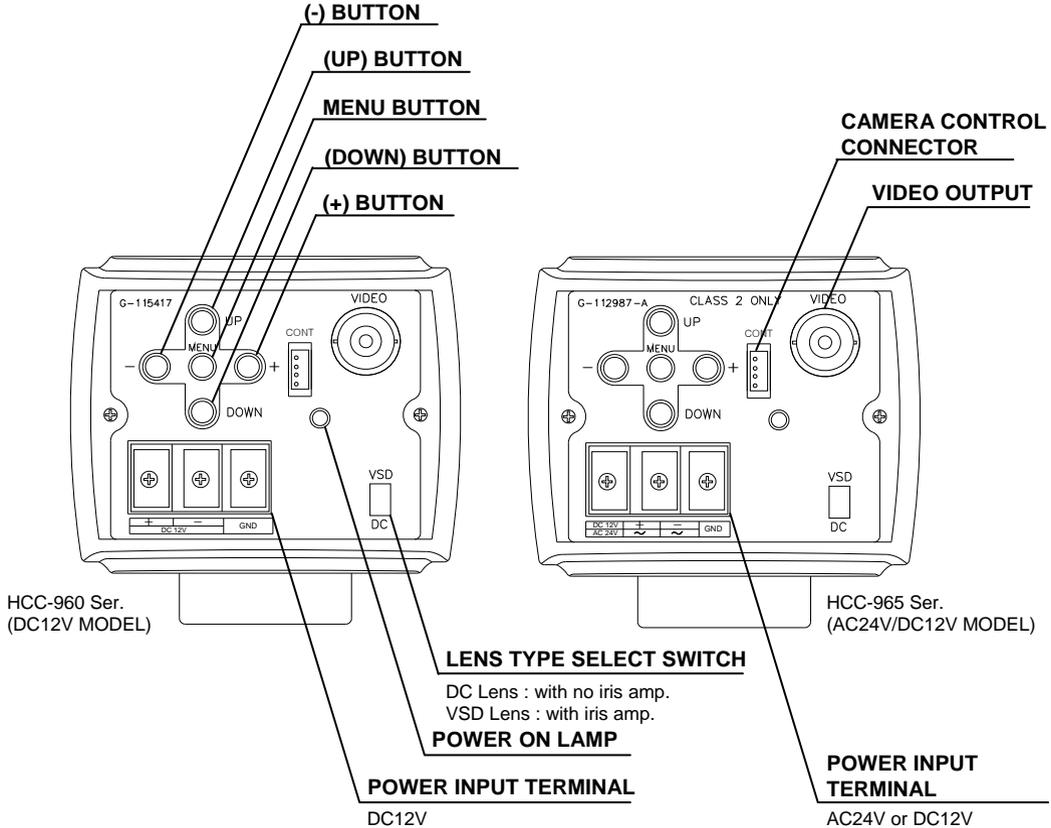
Honeywell's HCC-960/965 Series is a high resolution color camera with high sensitivity CCD.

6

- 1/3" Super HAD CCD II (NTSC: 520,000 / PAL: 610,000)
- Outstanding BLC implementation with WDR (Wide Dynamic Range) function
- High Sensitivity with SENS-UP (max. 512FLD) in the dark
- Excellent DNR (Digital Noise Reduction) function (2D-NR, 3D-NR)
- PZM (Privacy Zone Masking) of selected views for privacy protection
- Digital Zoom function (max. x256)
- Adapted adjustable C/CS mount
- Excellent signal-to-noise ratio of more than 50dB.
- 2-WAY Auto Iris : Both Video iris or DC iris lens can be used.
- Auto White Balance : Auto white balance realizes true color reproduction within various light sources.
- OSD Control
- Various Protocol for Remote Control (DEFAULT, PELCO, KD6, VCL)

2. Names & Functions





3. Installation

3.1 Check all accessories in the enclosed package .

- HCC-960/965 SET
- 4-pin connection cable
- OPERATION MANUAL
- Auto Iris Lens Plug

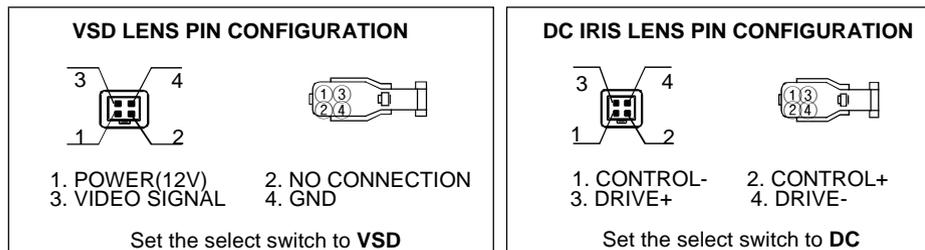
3.2 Mounting a Lens

3.2.1 C/CS Mount Lens

- ① Remove the protective cap in front of the camera.
- ② Adjust the mount ring whether it is for C or CS.
- ③ Loosen Set Screw with a Phillips screwdriver.
- ④ Turn the mount ring counterclockwise in case of C-Mount Lens.
Turn the mount ring clockwise in case of CS-Mount Lens

3.2.2 Auto Iris Lens

- ① Remove the cover of the iris lens plug and connect with Lens cable.



* For the best condition, read lens manual carefully.

- ② Connect the Lens plug to the Lens connector (SIDE PART)
- ③ LENS SEL. must be set to ALC MODE on OSD menu
 - In case lens has iris amplifier : Set DC LENS on OSD menu
 - In case lens doesn't have iris amplifier : Set VSD LENS on OSD menu
- ④ Set the S/W on the REAR of the camera to DC or VSD, too.
 - ☞ When connecting Auto iris lens, make sure to use the connector recommended by manufacturer. (E4-191, Chuo Musen, Japan)
 - ☞ After connecting Auto iris lens you may need to set flange back focus.

3.3 Flange back focus adjustment

3.3.1 In case of fixed focus lens

- a. Loosen the Set Screw and set the focus ring of lens to infinity (∞).
- b. Tune the mount adapter to get a clear picture (distance from camera to object is more than 23m) and fasten the Set Screw.

3.3.2 In case of zoom lens

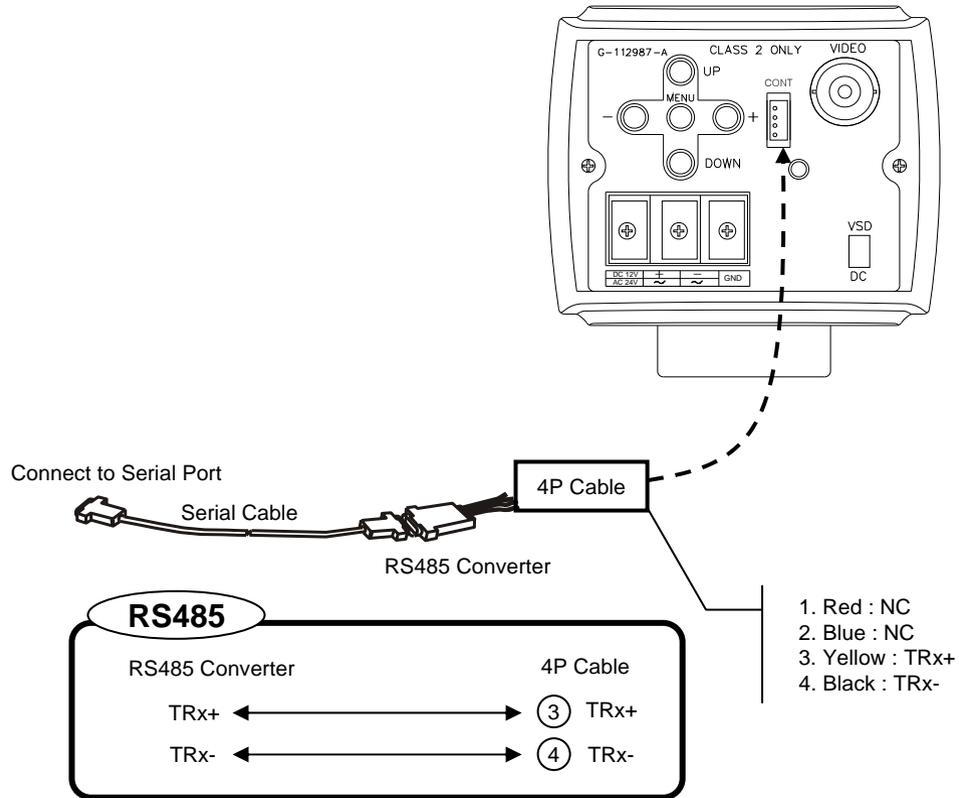
- a. Loosen the Set Screw and set the lens to the maximum telephoto position.
Then turn the focus ring to focus.
 - ☞ in the case of Auto iris lens, shoot a comparatively dark object or reduce the ambient light so that the Iris is fully open.
- b. Set the lens to its maximum wide angle position, and set the focus.
- c. Repeat step a and b, until the difference between focusing position a and b is smallest.
- d. When the best focusing point is found, fasten the Set Screw.

3.4 Connection of POWER supply

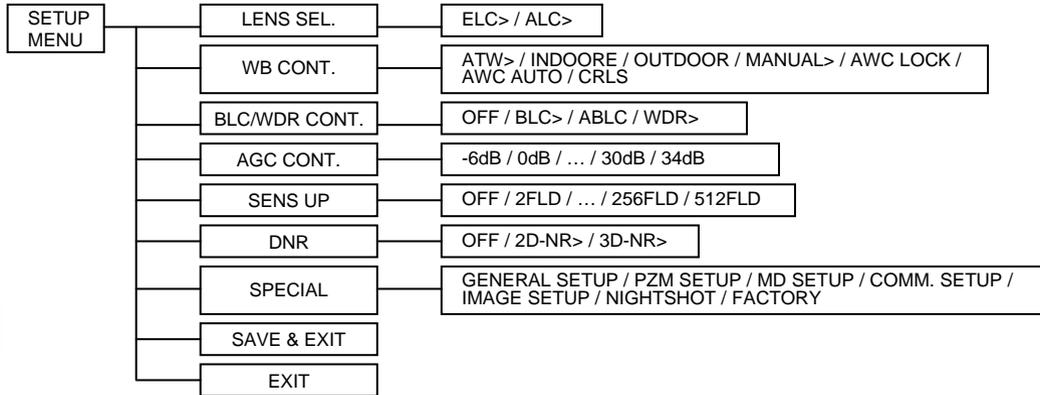
- ☞ Power source must be checked from the external power supply before power is on.
- ☞ Power source capacity :
 - AC24V, more than 500mA
 - DC12V, more than 500mA

4. Remote Control Connection

4.1 RS-485 Connection



5. On Screen Display



5.1 Understanding the On-Screen Display

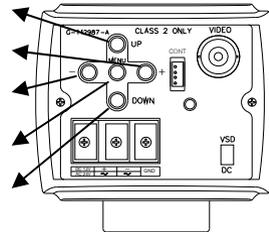
UP BUTTON

RIGHT BUTTON

LEFT BUTTON

SETUP BUTTON

DOWN BUTTON



<< SETUP MENU >>		
LENS SEL.	ELC >	5.2
WB CONT.	ATW >	5.3
BLC/WDR CONT.	OFF	5.4
AGC CONT.	24dB	5.5
SENS UP	8FLD	5.6
DNR	OFF	5.7
SPECIAL		5.8
SAVE & EXIT		
EXIT		

<Fig.5-1 SETUP MENU>

① Display SETUP MENU

- Press and hold the MENU button for 2 seconds to display the SETUP MENU.
- Press the UP or DOWN button to select a menu item.

② Move from SETUP MENU to submenu

- Press + or – button to enter the selected submenu.
- Press the UP or DOWN button to select a menu item.

* If you don't operate any key for 20sec, OSD will appears on the monitor.

5.2 AE mode setting

ELC: for a manual lens

ALC: for an automatic iris lens (DC or VSD)

LENS SEL. **ELC> / ALC>**

<< AE SETUP >>	
CONTROL	AUTO
SHUTTER	--
LEVEL ADJ.	--
BRIGHTNESS	30
SAVE & EXIT	
EXIT	

<Fig.5-2 ELC Setting>

5.2.1 ELC mode

① Electronic iris control

AUTO: Iris operates electronic exposure automatically.

MANUAL: Iris is fixed by SHUTTER value.

CONTROL **AUTO / MANUAL**

② Shutter speed control

This field is not adjustable when the camera is set to AUTO.

SHUTTER **1/53(1/63)→1/120(1/100)→ 1/250**
→ ... → 1/10000

③ ELC brightness adjustment

BRIGHTNESS **0 ~ 100**

<< AE SETUP >>

CONTROL	DC
SHUTTER	1/63
LEVEL ADJ.	COMPLETED
BRIGHTNESS	40
SAVE & EXIT	
EXIT	

<Fig.5-3 ALC Setting>

5.2.2 ALC mode

① Lens type select

CONTROL **DC / VSD**

② Shutter speed control

This field is not adjustable when the camera is set to AUTO.

SHUTTER **1/53(1/63)→1/120(1/100)→ 1/250**
→ ... → 1/10000

③ Lens level adjustment

Adjust level for DC / VSD lens. While it is adjusting, it displays "ADJUSTING", after it is completed, it displays "COMPLETED".

LEVEL ADJ. **ADJUSTING → COMPLETED**

☞ Do not use this adjustment in the dark.

④ ALC brightness adjustment

BRIGHTNESS **0 ~ 100**

5.3 White Balance mode setting

ATW (Auto Trace White Balance Mode)
Feedback system that automatically aligns the white balance (2,500°K ~ 8,000°K).

INDOOR
General indoor scenes preset (3200°K)

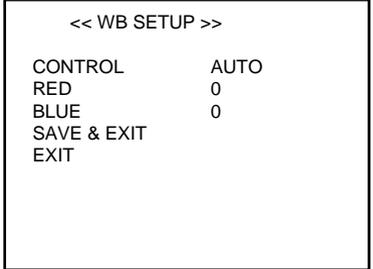
OUTDOOR
Preset for outside environments and high contrast scenes where the camera is focused on the darker (5400°K)

MANUAL
White Balance can be moved on black body curve manually.

AWC LOCK / AWC AUTO
Performs faster action than ATW mode without an operating range

CRLS (Color Rolling-less Mode)
Reduces color rolling under the office environments with fluorescent light.

WB CONT. **ATW> → INDOOR → OUTDOOR
 → MANUAL> → AWC LOCK>
 → AWC AUTO → CRLS**



<Fig.5-4 WB Setting>

☞ Submenu can be entered as Fig.5-4 when one of ATW, MANUAL, AWC LOCK is selected.

5.3.1 ATW

In ATW mode, change of RED and BLUE value means White shift to reddish or bluish.

CONTROL AUTO
RED -127 ~ 127
BLUE -127 ~ 127

5.3.2 MANUAL

CONTROL R/B
RED UP → STOP
BLUE DOWN → STOP

☞ Press + or – button to adjust RED or BLUE gain.
While pressing the button, it displays “UP” or “DOWN”.

5.3.3 AWC LOCK

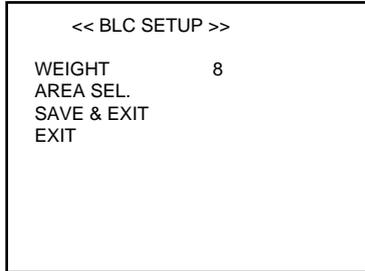
CONTROL PUSH → LOCK
RED --
BLUE --

☞ While pressing + or – button, it displays “PUSH”.

5.4 Backlight Compensation setting

Prevents the object in the center of the image from darkening (silhouette effect) when there is excessive light from behind.

BLC/WDR CONT. OFF → BLC> → ABLC → WDR>

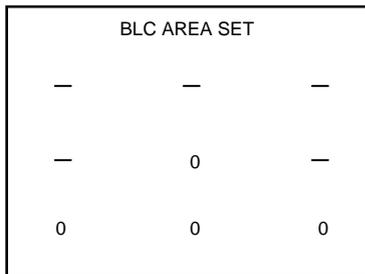


<Fig.5-5 BLC Setting>

5.4.1 BLC

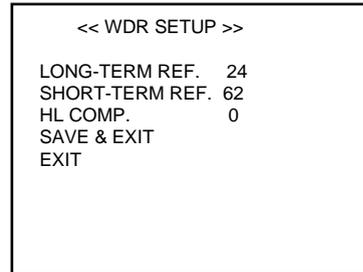
WEIGHT 0 ~ 15

Place the cursor on AREA SEL., and press + or - button. It shows Fig.5-6.



<Fig.5-6 BLC Area Setting>

- : excessive light area
0 : the subject area



<Fig.5-7 WDR Setting>

5.4.2 WDR

WDR (Wide Dynamic Range) is one of Backlight Compensation, you can watch not only the object in the center but also the objects around clearly.

LONG-TERM REF. 0 ~ 255
SHORT-TERM REF. 0 ~ 255
HL COMP. 0 ~ 63

The higher HL COMP. value, you can see the bright area clearly.

1-8P LONG-TERM REF. & SHORT-TERM REF. are the weight of WDR operation. If you change the value excessively, WDR may not operate.

5.5 AGC setting

Adjust maximum value of AGC gain

AGC CONT. **-6dB → 0dB → ... → 30dB → 34dB**

5.6 Sens up setting

Compensate low illumination condition.

Adjust the maximum integration fields to get a brighter dynamic image. The scene will be slower than when set to OFF. The larger this field, the greater the noise of the image. For more dynamic range, adjust the SENS UP and increase AGC.

SENS UP **OFF → 2FLD → 4FLD → ... → 128FLD**
→ 256FLD → 512FLD

5.7 Digital Noise Reduction setting

The background noise in the low light level increases automatically as the level of gain changes.

2D-NR or 3D-NR can decrease digital noise.

DNR **OFF → 2D-NR> → 3D-NR>**

2D-NR and 3D-NR have a submenu, you can set the DNR level.

In case of 2D-NR, **LEVEL** **1 ~ 6**

In case of 3D-NR, **LEVEL** **1 ~ 31**

ℹ The higher the level in 3D-NR, the greater the level of noise is reduced, however there will be an increase in the ghost image.

5.8 Special Setup

<< SPECIAL SETUP >>

GENERAL SETUP
 PZM SETUP
 MD SETUP OFF
 COMM. SETUP
 IMAGE SETUP
 NIGHTSHOT OFF
 FACTORY
 SAVE & EXIT
 RETURN

<Fig.5-8 Special Setup>

5.8.1 General Setup

<< GENERAL SETUP >>

SYNC. 20
 BURST 100
 SHARPNESS 8
 GAMMA 4
 SAVE & EXIT
 RETURN

<Fig.5-9 General Setup>

- ① Sync. signal level setting
SYNC. **0 ~ 50**
- ② Burst signal level setting
BURST **0 ~ 255**
- ③ Sharpness level setting
SHARPNESS **0 ~ 15**
- ④ Gamma setting
GAMMA **0 ~ 8**

5.8.2 Privacy Zone Masking setting

PZM (Privacy Zone Masking) is to hide the selected view for privacy protection.

<< PZM SETUP >>	
ZONE NUMBER	1
DISPLAY	OFF
SIZE SET	
ALPHA	1
MOSAIC	OFF
COLOR	BLUE
SAVE & EXIT	
RETURN	

<Fig.5-10 PZM Setup>

- ① PZM zone setting
ZONE NUMBER 1 ~ 16
- ② PZM Display setting
DISPLAY OFF → ON
- ③ PZM size setting
Press + or – button to set PZM size and position.
- set the PZM size using direction buttons (+,-,UP,DOWN)
- press MENU button in order to change the position.
- set the PZM position using direction buttons.
- press the MENU button more than 2 seconds to exit size and position setting menu.
- ④ PZM alpha blending setting
ALPHA 0 ~ 3
- ⑤ Mosaic function setting
MOSAIC OFF → ON
- ⑥ PZM color
COLOR BLUE → GREEN → YELLOW → CYAN
→ MAGENTA → BLACK → D.GRAY → L.GRAY → WHITE → RED

5.8.3 Motion Detection setting

The camera detects an object's movement by sensing disparity of outline.

<< MD SETUP >>	
AREA SEL.	
SENSITIVITY	128
DISPLAY	TRACE
BRIGHTNESS	8
SAVE & EXIT	
RETURN	

<Fig.5-11 MD Setup>

- ① AREA SEL.
In AREA SEL. menu, you can set zone, function off/on, frame size.
- ② Sensitivity setting
If the value is lower, it has higher sensitivity.
SENSITIVITY 0 ~ 255
- ③ Display setting
TRACE: display the trace with small squares when object's movement is detected.
FRAME: display the zone when object's movement is detected in the zone.
DISPLAY TRACE → FRAME
- ④ Brightness setting
BRIGHTNESS 0 ~ 15

5.8.3.1 MD area selection

Select AREA SEL. and press + or – button to enter submenu. It will show as in Fig.5-12.

<< MD ZONE SETUP >>	
ZONE	1
FUNCTION	OFF
SIZE SET	
SAVE & EXIT	
RETURN	

<Fig.5-12 MD Zone Setup>

① MD Zone setting

This zone is effective when MD DISPLAY is FRAME.

ZONE 1 ~ 4

② Function setting

FUNCTION OFF → ON

③ MD frame size setting

Press + or – button to set MD frame size and position.

- set the MD frame size using direction buttons

(+, -, UP, DOWN)

- press MENU button in order to change the position.

- set the MD frame position using direction buttons.

- press the MENU button and hold for more than

2 seconds to exit size and position setting menu.

5.8.4 Communication setting

In order to use remote control through RS-485, set the values properly.

<< COMMUNICATION SETUP >>	
CAMERA ID	1
BAUDRATE	9600
PROTOCOL	DEFAULT
SAVE & EXIT	
RETURN	

<Fig.5-13 Comm. Setup>

① Camera ID setting

CAMERA ID 0 ~ 255

② Baudrate setting

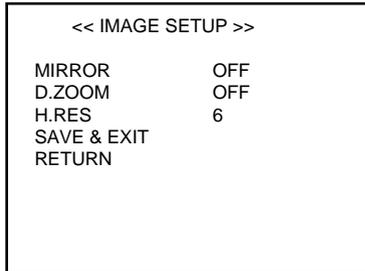
BAUDRATE 2400 → 4800 → 9600 → 19200
→ 38400 → 57600

③ Protocol setting

PROTOCOL DEFAULT → PELCO → KD6 → VCL

5.8.5 Image setting

Select IMAGE SETUP and press + or – button to enter submenu. It will show as in Fig.5-14.



<Fig.5-14 Image Setup>

① Mirror setting

MIRROR **OFF → H.MIR → V.MIR → FLIP**

② Digital Zoom setting

To use this function, set D.ZOOM to ON and exit OSD MENU pressing SAVE & EXIT. Maximum zoom is up to x256.

UP button: ZOOM IN, DOWN button: ZOOM OUT
D.ZOOM **OFF → ON**

③ High Resolution level setting

H.RES **OFF → 1 → ... → 8**

5.8.6 Software Day & Night mode setting

The NIGHTSHOT SETUP allows to set the camera reaction under low light illumination and switch mode between Day and Night modes.

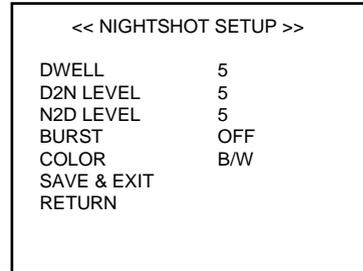
AUTO – Day and Night modes change by auto detecting luminance.

ON – Night mode

OFF – Day mode

NIGHTSHOT **OFF → AUTO> → ON**

Fig.5-15 is the submenu of NIGHTSHOT AUTO.



<Fig.5-15 Nightshot Setup>

① Dwell time setting

DWELL **1 ~ 30**

② Day to Night level setting

D2N LEVEL **0 ~ 10**

③ Night to Day level setting

N2D LEVEL **0 ~ 10**

④ Burst signal setting

BURST **OFF → ON**

⑤ Color setting

COLOR **B/W → COLOR**

5.8.7 Factory Default

All changed settings are returned to shipping condition.

For Initialization, select "FACTORY" and push + or - button.

 **caution**

1. Keep in mind that this mode reset all changed data back to shipping condition.
2. Some menu such as LENS SEL, CAMERA ID, etc are not initialized.

6. Specifications

MODEL	HCC-960N-VR	HCC-960P-VR	HCC-965P-VR
Image Pick-up Device	1/3" Sony Super HAD II (520,000pixels)	1/3" Sony Super HAD II (610,000pixels)	
Effective pixels	976H * 494V (480,000pixels)	976H * 582V (570,000pixels)	
Scanning system	525 Lines 2:1 Interlace	625 Lines 2:1 Interlace	
Sync system	Internal		
Scanning frequency	15.734KHz(H), 59.94Hz(V)	15.625KHz(H), 50.0Hz(V)	
Horizontal Resolution	More than 650 TV Lines		
Minimum illumination	Less than 0.1lx (F1.2, 50IRE, AGC 34dB) Less than 0.001lx (F1.2, 50IRE, AGC 34dB, 512FLD)		
Electronic Shutter	Auto (1/60~100,000sec), Manual (8steps)	Auto (1/50~100,000sec), Manual (8steps)	
S/N Ratio	More than 50dB		
AGC	-6 ~ 34dB (7steps)		
White Balance	ATW, INDOOR, OUTDOOR, MANUAL, AWC LOCK, AWC AUTO, CRLS		
BLC	OFF / BLC / ABLC / WDR		
Privacy Zone Masking	Max. 16 zones (Alpha, Mosaic, Color)		
Digital Noise Reduction	OFF / 2D-NR / 3D-NR		
Motion Detection	Trace / Frame		
Day & Night Mode	Software Day & Night		
Gamma Correction	0 ~ 8 (9steps)		
Digital Zoom	Max. x256		
ALC	EE / VSD / DC		
Video Output	Composite Video Signal 1Vp-p, BNC Output		
Camera Control	RS-485		
Lens Mount	C / CS Mount		

MODEL	HCC-960N-VR	HCC-960P-VR	HCC-965P-VR
Power Source	DC12V±2V	DC12V±2V	AC24V±10%, DC12V±2V
Power Consumption	Max. 2.5W	Max. 2.5W	Max. 4W
Power Input	Terminal Block, 3pin		
Operating Temperature	-10 ~ +50 °C		
Storage Temperature	-20 ~ +70 °C		
Operating Humidity	90% RH (non-condensing)		
Color	Silver & Gray		
Dimension	68(W) x 56(H) x 118(D) mm		
Weight	360g	360g	390g

MEMO

Honeywell

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