

Economy **DSP Color CCD Camera**

C400N/ C500N

OPERATING MANUAL

For Customer Use :

Please record the model No. and the serial No. in the spaces provided below. These numbers located on the bottom of the camera.

Keep this manual for future reference.

Model No. _____

Serial No. _____



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 PERSONAL.



This lightning flash with arrowhead 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 exclamation point symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Due to design modification, data given in this instruction book are subject to possible change without prior notice.

WARNING :
TO PREVENT THE RISK OF FIRE OR ELECTRIC SHOCK HAZARD, DO NOT EXPOSE THIS CAMERA TO RAIN OR MOISTURE.

Information for USA

This device complies with Part 15 of the FCC rules. Changes or modifications not approved by Costar could void the user's authority to operate the equipment.

Thank you for purchasing this color CCD camera. Before using this camera, please read this operating manual carefully to obtain the best result and keep this manual for future reference.

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PRECAUTIONS

Operating

- Before using, make sure of power supply and connection of video output.
Power supplied without voltage stabilization or the voltage maintained at $12V \pm 10\%$ DC may cause damage.
- While operating, if any abnormal condition or a malfunction is observed, stop using the camera immediately and then call your local dealer.

Handling

- Do not disassemble the camera and never touch parts inside the camera.
- Do not drop the camera or subject it to shocks and vibrations to avoid possible damage.
- When attaching or removing the lens, handle with care in order that moisture and dust does not enter the camera.
- Do not shoot any source of bright light. if the object contains 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.

Installation and storage

- Do not point the camera at the sun. This could damage the camera whether it is operating or not.

- Do not install the camera where the temperature could exceed the allowable range.
Be sure the ambient temperature is less than 40°C for long term continuous operation.
- Avoid installing in humid or dusty places.
- Avoid installing in places where there is radiation. This could damage CCD and other components and cause malfunction.
- Avoid installing in places where there are strong magnetic fields and electric signals.
- Avoid installing in places where the camera would be subject to strong vibrations.
- Never expose the camera to rain and water.

Cleaning

Turn the power off and wipe off the dirt with dry soft cloths. If it is extremely dirty, use furniture cleaning tissue. Do not use alcohols, petroleum distillates, liquid cleaners or sprays.

Daily check

Make daily check for proper operation for surveillance use. In order to maintain normal operation, the output of camera should be checked by user everyday for a clear and focused picture.

FEATURES

High sensitivity

- 410,000 pixels CCD with on-chip microlenses and low noise digital signal processing circuit provide maximum sensitivity down 0.3 lux (F1.2)

High quality image

- High resolution, high sensitivity design for a horizontal resolution of 470 TV lines.
- High quality image is obtained by digital signal processing with optimization of control program and image correction algorithm.

Back light compensation

When strong light entering the scene background such as from a spotlight or window, back light compensation function automatically adjust the video level so as to preserve visibility in important sections of the image.

White balance

Three control modes of auto-tracking preset and manual white balance can be selected according to conditions.

Iris function

Provide a drive output for video iris lens.

Also built-in electronic shutter to allow 11 shutter speeds up to 1/50,000 sec.

CCD iris function automatically set the brightness of the picture by changing the shutter speed of the camera according to the incident light when using a manual iris lens.

Other versatile functions

- Text display function of up to 24 characters.
- Separated Y/C video signal output.
- Special menu functions for gamma, color adj., contrast, sharpness, preset
- Use either C or CS mount lenses.

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NAME AND FUNCTIONS

Lens mount

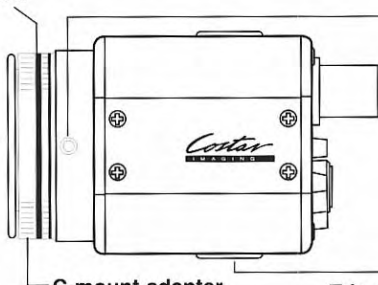
Mount for installing the lens. C-mount lens can be used when C-mount adapter is attached, and CS-mount lens can also be used when it is removed.

Back-focus screw

A screw is provided to fix the lens mount. See page 20.

Lens mount cap

Be sure to cap the lens mount when the lens is not mounted.



C-mount adapter

To mount a C-mount lens. And remove to mount a CS-mount lens. Turn counterclockwise to remove it. Also refer to page 19.

Tripod mounting base

Mounting base for installing the camera.

Power indicator

Lights up when the camera is powered.

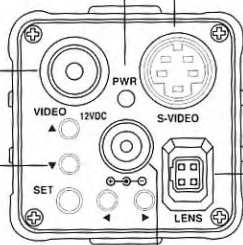
Video output connector

BNC connector that outputs a composite video signal.

Setup buttons

When use setting up and adjusting the camera with reference to the on-screen menu.

See page 7.



S-VIDEO connector

Output connector for separated Y/C video signal.

Connect to the S-VIDEO input connector of video monitor,

See page 18.

Lens connector

When using an auto-iris lens, connect the lens cable to this connector.

See page 18.

Power input terminal

Connect to a DC12V power power source.

(Be sure not to connect the power source until all other connections are completed.)

MENU SYSTEM

GENERAL

The menu system can activate all the features and option of the camera.

The menus are superimposed on the image displayed on the screen. The commands can open other menus, toggle options, or change variable parameters.

MENU OPERATION

Five rear panel Setup buttons are used to shift the cursor and select items from the menus.



- ① Up button: Shift the cursor upwards.
- ② Down button: Shift the cursor downwards.
- ③ Left button: Shift the cursor toward the left.
- ④ Right button: Shift the cursor toward the right.
- ⑤ Set button: To display the main menu or check the setting and proceed to the next item.

The camera settings and adjustments can be changed to accommodate usage conditions.

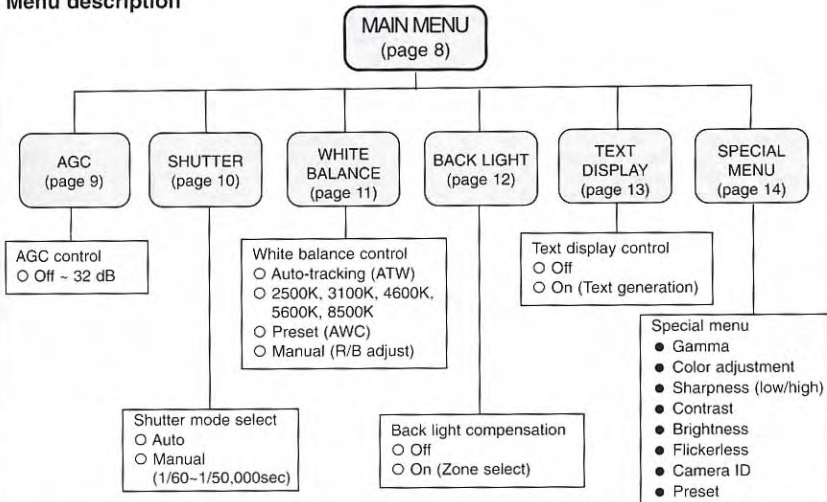
When connected to a monitor, convenient on-screen menus facilitate checking and changing the settings and adjustments.

A brief help lines is often presented on the screen below the list of commands.

The complete set of current parameters is saved, and will be loaded each time turn on the camera until the next time change the setup.

The setting menus are illustrated on the next page.

Menu description



MAIN Menu

- 1) Press the Set button to display the main menu on the monitor screen.
- 2) Check the present settings at the main menu.

MAIN MENU	
Lens	: VIDEO
→ AGC	: ON
Shutter	: AUTO
White Balance	: ATW
Back Light	: OFF
Text Display	: OFF
Sync Mode	: N.A
Special Menu	
End	

Main menu

- 3) If changes are unnecessary, shift the cursor to the END position and press the Set button to return the normal video screen.
- 4) When a setting is changed by pressing the Setup buttons, the new setting is stored in the internal memory by pressing the Set button with position the cursor at End. Afterwards, when the camera power is cut off and returned, operation proceeds at the most recent settings.

LENS

- 1) Press the Set button to display the main menu.
- 2) Position the cursor at LENS and press the left or right button for setting the lens mode.

MAIN MENU	
• Lens	: MANUAL
AGC	: ON
Shutter	: AUTO
White Balance	: ATW
Back Light	: OFF
Text Display	: OFF
Sync Mode	: N.A
Special Menu	
End	

After setting, press the Set button to return to main menu.



Note : DC type auto iris lenses do not work with this camera.

AGC on/off

- 1) Press the Set button to display the main menu.
- 2) Position the cursor at AGC and press the left or right button to setting the AGC max level.
- 3) AGC max level has 16 stage from OFF to 32 dB.

Right button (ascending sequence) :

OFF → 2dB → 4dB → 6dB → 8dB → 10dB → 12dB
→ 14dB → 16dB → 18dB → 20dB → 22dB → 24dB
→ 26dB → 28dB → 30dB → 32dB → OFF

Left button (descending sequence) :

32dB → 30dB → 28dB → 26dB → 24dB → 22dB →
20dB → 18dB → 16dB → 14dB → 12dB → 10dB
→ 8dB → 6dB → 4dB → 2dB → OFF → 32dB

At the AGC on setting, camera's sensitivity is automatically increased to setting level when the ambient light drops.

Electronic shutter control

- 1) Press the Set Button to display the main menu.
- 2) Position the cursor at SHUTTER, and press the left or right button to setting the Auto shutter.

MAIN MENU

Lens	: VIDEO
AGC	: ON
→ Shutter	: MANUAL
White Balance	: ATW
Back Light	: OFF
Text Display	: OFF
Sync Mode	: N.A
Special Menu	
End	

AUTO Mode

When using the manual iris lens, the brightness of the picture image will be fixed by setting this auto mode, as the shutter speed is automatically varied according to the incident light.

Note : Outdoor illumination levels may exceed 150,000 lux, which is outside the range that can be controlled by the electronic shutter. For proper operation of electronic shutter, If illumination levels exceed 10,000 lux, use a auto-iris lens.



MANUAL Mode

- 1) Press the Set button to set the manual shutter speed when position the cursor at SHUTTER and shutter mode is manual.

MANUAL SHUTTER

→ Shutter Speed : 1/60

Press SET to Main Menu

- 2) Press the left or right direction button to select a shutter speed from 1/60 to 1/100,000 sec.
Right button (ascending sequence) ;
1/60 → 1/100 → 1/120 → 1/250 → 1/500 → 1/1000
→ 1/2000 → 1/4000 → 1/10000 → 1/30000 →
1/50000 → 1/60 sec

Left button (descending sequence) :

1/50000 → 1/30000 → 1/10000 → 1/4000 → 1/2000
→ 1/1000 → 1/500 → 1/250 → 1/120 → 1/100 → 1/60
→ 1/150000 sec

After setting, press the Set button to return to main menu.

White balance control

- 1) Press the Set button to display the main menu on the monitor screen.
- 2) Position the cursor at WHITE BALANCE and press the left or right button to change the white balance control mode.

Three white balance control modes can be selected according to conditions.

When press the left or right button again, white balance control will be changed the next mode.

MAIN MENU	
Lens	: VIDEO
AGC	: ON
Shutter	: AUTO
→ White Balance	: AWC
Back Light	: OFF
Text Display	: OFF
Sync Mode	: N.A
Special Menu	
End	

ATW (Auto-tracking white balance)

The white balance mode is set to auto-tracking white balance.

This mode is accepted different types of lighting using an automatic tracking system and automatically controlled in the color temperature range of 2400K to 10000K.

Note : The ATW mode may not function properly in the following cases.



In such a case, set to the "manual" mode.

- When shooting with non-standard lighting or lighting with a color temperature that exceeds the range of the camera.
- When a large part of the scene is occupied by a single color or a completely red or blue background.

2500K, 3100K, 4600K, 5600K, 8500K White balance

In this mode, white balance is activated as 2500K, 3100K, 4600K, 5600K and 8500K color temperature condition.

AWC (Preset white balance)

Arrange to have a white object present in the scene and press the Set button to set the Preset white balance, when position the cursor at WHITE BALANCE and the mode is AWC.

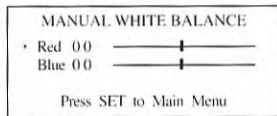
Setting the preset white balance takes several seconds and setting is completed when "AWC" flickering is disappear.

Note : In order to avoid failure of AWC mode setting, do not move the camera or the object until the message of "white balance completed" appear.



MANUAL (Manual white balance)

- 1) Press the Set button to setting Manual white balance when position the cursor at WHITE BALANCE and the mode is MANUAL.
- 2) Press the left, right, up, down direction buttons to control the Red/Blue gain.
Gain level is indicate from 0 to 20.



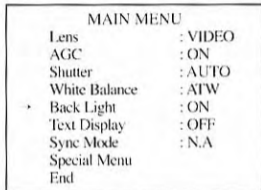
After setting, press the Set button to return to main menu.

Back light compensation

Strong light, such as from a spotlight or window, entering the scene background causes the lens iris to close, thereby possibly obscuring desired portions of the scene. Back light compensation functions.

automatically adjust the video level so as to preserve visibility in important sections of the scene.

- 1) Press the Set button to display the main menu.
- 2) Position the cursor at BACK LIGHT and press the left or right button to setting the back light on.
- 3) Press the left or right button again, back light setting returns to off.



BLC ZONE SETTING

Backlight control use 6 sensing zones.

The BLC zone setting is activated on the screen by left or right button to allow the most suitable area to be selected while observing the monitor.

Press the Set button to select BLC zone when position the cursor at BACK LIGHT and back light mode is on.

BLC ZONE SET	
• Zone Display	
Zone 1	: OFF
Zone 2	: OFF
Zone 3	: OFF
Zone 4	: OFF
Zone 5	: OFF
Zone 6	: ON
Press SET to View Zone	

Position the cursor at Zone display and press the set button to view zone.

Zone 1 off		Zone 2 off	
Zone 5 off	Zone 6 off	Zone 5 off	
Zone 3 off		Zone 4 off	

Decide a BLC zone number for desired portions of the scene.

- 1) Press the Set button to display the BLC zone set.
- 2) Press the up, down direction buttons to move the cursor to desired BLC zone.
- 3) Press the left, right direction buttons to setting the sensing zone which want to preserve visibility in important section of the scene.

BLC ZONE SET	
Zone Display	
• Zone 1	: ON
Zone 2	: OFF
Zone 3	: OFF
Zone 4	: OFF
Zone 5	: OFF
Zone 6	: ON
Press SET to Main Menu	

After setting, press the Set button to return to main menu.

Text display

- 1) Press the Set button to display the main menu on the monitor screen.
- 2) Position the cursor at TEXT DISPLAY and press the left or right button to setting the text display on.
- 3) Press the left or right button again, text display setting returns to off.

MAIN MENU	
Lens	: VIDEO
AGC	: ON
Shutter	: AUTO
White Balance	: ATW
Back Light	: OFF
• Text Display	: ON
Sync Mode	: N.A
Special Menu	
End	

TEXT GENERATION

A maximum of 24 alphanumeric characters (1 line) can be displayed on the screen.

- 1) Press the Set button to text generation when position the cursor at TEXT INPUT.
- 2) Press the up and down direction button continuously to selecting characters.
- 3) Press the right direction button to move for next character selecting.

Text Set
→ Text Input
Position set
End

Supplied characters are as follows.

ABCDEFGHIJKLMN OPQRSTUVWXYZ01234567890()
<>+-*/., (Blank)

TEXT LOCATION

- 1) Press the Set button for setting text location when position the cursor at Position Set.
- 2) Press the left, right, up, down direction buttons to move the text location.

After setting, press the Set button to return to main menu when position the cursor at End.

After setting, press the Set button to return to main menu.

Sync mode

Sync mode is only used Internal synchronization.

Special Menu

The special menu function allows to change the video output qualities to match the particular applications.

- 1) Press the Set button to display the main menu.
- 2) Position the cursor at SPECIAL MENU and press the Set button to display the special menu.

SPECIAL MENU	
→ Gamma	
Color Adj.	
Sharpness	: LOW
Contrast	: OFF
Brightness	
Flickerless	: OFF
Preset	
Camera ID	: 000
END	

Special Menu

● SHARPNESS

- 1) Position the cursor at SHARPNESS and press the left or right button for setting the sharpness HIGH.
- 2) Press the left or right button again, the sharpness setting returns to LOW.

SPECIAL MENU	
Gamma	
Color Adj.	
→ Sharpness	: HIGH
Contrast	: OFF
Brightness	
Flickerless	: OFF
Preset	
Camera ID	: 000
END	

● CONTRAST


If strong illumination such as a spotlight or outdoor light is present in the background, causing the scene to By setting the contrast compensation function, the dark areas are enhanced, and brightened the image.

- 1) Position the cursor at CONTRAST and press the left or right button for setting the contrast compensation function to ON.
- 2) Press the Set button again, the contrast compensation function returns to off.

SPECIAL MENU	
Gamma	
Color Adj.	
Sharpness	: LOW
→ Contrast	: ON
Brightness	
Flickerless	: OFF
Preset	
Camera ID	: 000
END	

● BRIGHTNESS

- 1) Position the cursor at BRIGHTNESS and press the Set button for setting the brightness.
- 2) Press the left, right direction button for setting the brightness level.

BRIGHTNESS	
→ Level 10	
Press SET to Return	

After setting, press the Set button to return to special menu.

● FLICKERLESS

If the camera is used with 50 Hz fluorescent lighting, and there is flickering on the monitor. In this case, set the FLICKERLESS mode to ON. Otherwise it should be set to off.

- 1) Position the cursor at FLICKERLESS and press the left or right direction button for setting the flickerless on.
- 2) Press the left or right button again, the flickerless setting is return to off.

SPECIAL MENU	
Gamma	
Color Adj.	
Sharpness	: LOW
Contrast	: OFF
Brightness	
→ Flickerless	
Preset	
Camera ID	: 000
END	

● PRESET

This function is useful when the camera is used the frequently changed setup conditions.

- 1) Position the cursor at PRESET and press the set button to display the Preset menu.
- 2) Press the up or down direction button to selected the preset menu.

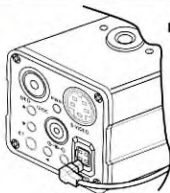
- 3) Position the cursor at FACTORY and press the set button to perform the Factory Setup.

Factory Set is provide the best image under the normal condition by factory setup.

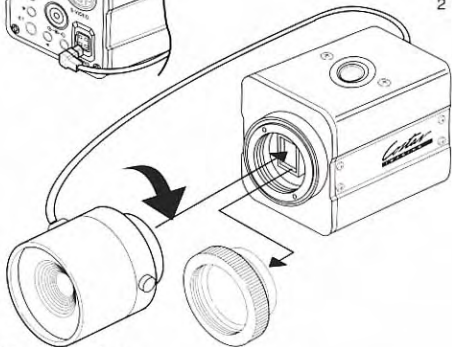
Also, user save function is useful when the camera is used the special setup by user.

PRESET MENU	
→ Set to FACTORY	
Set to USER	
Save to USER	
END	
Factory is selected	

LENS INSTALLATION

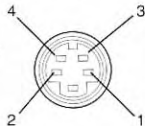


■ Please attach a lens cable when using the Video type auto iris lens



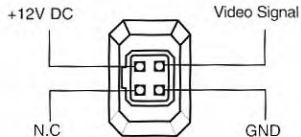
Video Camera Lens

Pin assignment : S-VIDEO connector (4-pin)



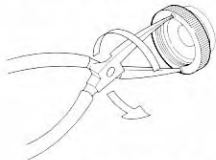
Pin No.	Signal
1	GND
2	GND
3	Y (Luminance, 1Vp-p, 75Ω)
4	C (Chrominance, 0.286Vp-p, 75Ω)

When using the VIDEO-type auto-iris lens, install the lens plug as follows. If the plug on the cable is of a different type, replace it with the provided 4-pin iris plug.



Mounting a lens

- 1) Remove the lens mount cap from the camera.
- 2) Attach or remove the C-mount adapter depending on the lens to be used.
 - If the adapter is attached so tightly that is difficult to remove, use long-nosed pliers to remove it. Insert the tips of the pliers into the holes with no threads, thus turn to remove.
Or a screwdriver can also be used, as shown. Insert M3 screws into the holes so that the screwdriver has something to grip. (Store the C-mount adapter for possible future use.)



- 3) Attach the lens to the lens mount. Secure it so that it does not become loose.
- 4) If the lens has an auto-iris mechanism, connect the lens cable to the lens connector.

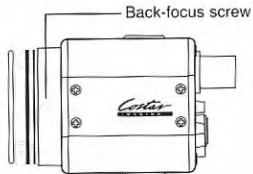
ADJUSTING AUTO-IRIS LENSES

Make this adjustment after connecting the camera to a power source and a monitor.

- 1) Set AGC mode to OFF.
- 2) When using a Video type lens :
Adjust the level control on the lens to produce minimum smear and optimum pictures.
- 3) Set AGC mode to on
It is recommended that the AGC be used in the "ON" mode after adjusting the video level.

Back-focus adjustment

When a lens is mounted, adjustment of the back-focus may sometimes be required. Adjust the lens focus ring when the correct focus cannot be obtained.



WITH A FIXED-FOCUS LENS

- 1) Fully open the aperture and set the focus ring to "∞" (infinity).

In the case of an auto-iris lens only, shoot a comparatively dark object so that the aperture is fully open.

- 2) Loosen the two back-focus screw with a hex wrench, and turn the lens mount to focus.
- 3) After adjusting the back-focus, tighten the back-focus screw.

Caution : Do not forcibly turn the back-focus screw, as it will cause damage to the camera.



WITH A ZOOM LENS

- 1) Fully open the aperture and set the lens to the maximum tele-photo position. Then turn the focus ring to focus.

In the case of an auto-iris lens only, shoot a comparatively dark object so that aperture is fully open.

- 2) Set the lens to its maximum wide-angle position.
- 3) Loosen the two back-focus screw with a hex wrench, and turn the lens mount to focus.
- 4) After adjusting the back-focus, tighten the back-focus screw
- 5) Repeat step 1) - 3) until the difference between focusing position 1) and 2) becomes smallest.

Caution : Do not forcibly turn the back-focus screw, as it will cause damage to the camera.



SPECIFICATIONS

Signal system	NTSC	Shutter speed range	1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/30000, 1/50000 second
Pickup element	SI-C400N : 1/2 CCD SI-C500N : 1/3 CCD	White balance	ATW, 2500K, 3100K, 4600K, 5600K, 8500K, AWC, and MANUAL
Effective pixels	768(H) x 494(V)	White balance range	2,400K ~ 10,000K
Scanning area(mm)	SI-C400N : 7.95(H) x 6.45(V) SI-C500N : 6.0(H) x 4.96(V)	Backlight Compensation	ON/OFF selectable (6 sensing zones)
Scanning system	2:1 interlace	Text display	24 alphanumeric characters (ON/OFF selectable)
Scanning frequency	Hor. : 15.734kHz Ver. : 59.94Hz	Special menu	Gamma, Color adj., Sharpness, Contrast, Brightness, Flickerless and Preset
Sync system	Internal	GAMMA	Variable
Video output		Flickerless	ON/OFF selectable
Composite video signal (1Vp-p/75Ω, unbalanced)		Lens Mount	C/CS mount
Separated Y/C signal (Y; 1Vp-p/75Ω, C; 0.286Vp-p/75Ω)		Camera mount	1/4 Inch -20UNC (Top/ Bottom)
Video S/N ratio	50dB (AGC OFF)		
Hor. Resolution	470 TV lines		
AGC range	0~32dB (16 Stage Variable)		
Minimum illumination	0.3lux (F1.2, 50IRE)		
Electronic shutter	OFF/AUTO/MANUAL		