

# 540TV Lines Super High Resolution Color Camera

1/3" INTERLINE TRANSFER CCD  
HIGH RESOLUTION



Please read this manual thoroughly before use, and keep it handy for future reference.

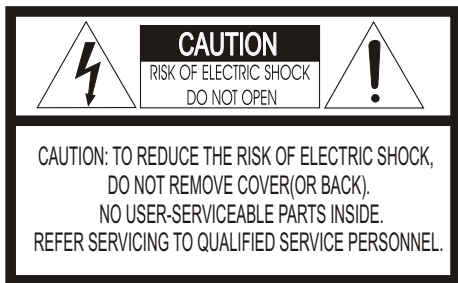
## **LIMITATION OF LIABILITY**

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 places 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:

- A. When the power supply cord or the plug has been damaged.
- B. If liquid has spilled or objects have fallen into the Unit.
- C. If the equipment has been exposed to water or other liquids.
- D. 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.
- E. If the equipment has been dropped or the casing Damaged.
- F. 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.

# TABLE OF CONTENTS

---

INTRODUCTION .....	1
CAMERA OVERVIEW .....	1
FUNCTION DESCRIPTION .....	2
CONNECTIONS .....	4
CONTENTS OF PACKAGE .....	4
MANUAL IRIS LENS ADJUSTMENT .....	4
VIDEO AUTO IRIS INSTALLATION & ADJUSTMENT .....	5
DC AUTO IRIS LENS INSTALLATION & ADJUSTMENT .....	6
BACK FOCUS ADJUSTMENT .....	7
ZOOM LENS BACK FOCUS ADJUSTMENT .....	8
TROUBLESHOOTING AND MAINTENANCE .....	8
SPECIFICATIONS .....	9

# INTRODUCTION

The camera provides high-quality images using SONY CCD technology especially designed for closed-circuit television (CCTV) and security surveillance applications.

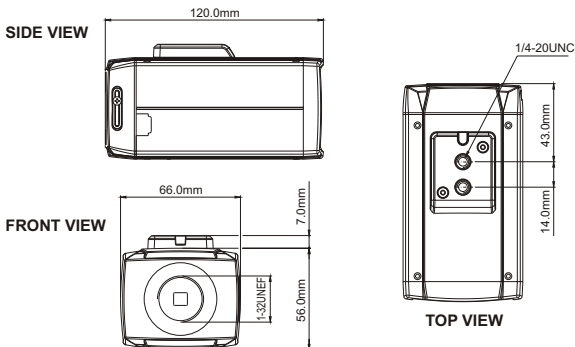
## Features:

- High resolution and high performance 1/3" SONY Super HAD CCD technology
- Excellent picture quality
- 540 lines(Color) of resolution
- 0.25 Lux(Color) / 0.01 Lux(B/W) @ F1.2 Sensitivity (True D&N)
- 0.25 Lux(Color) @ F1.2 Sensitivity (Digital D/N)
- C/CS, backfocus cam for easy adjustment
- Auto electronic shutter [1/60(1/50) ~ 1/100,000] and manual electronic Shutter modes
- Auto Trace White balance modes
- Selectable BLC function
- Day & Night (True D&N / Digital D/N)
- AGC (Auto Gain Control)
- Video out(BNC)
- Quick connect for video or DC lens with 4-pin connector
- Operates in 12VDC or 24VAC
- Use Certified / Listed Class 2 power supply only.



**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.

# CAMERA OVERVIEW



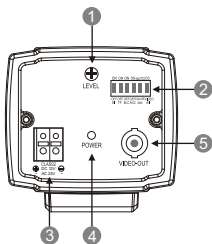
# FUNCTION DESCRIPTION

## - SIDE VIEW



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

## - REAR VIEW



- ① IRIS LEVEL
- ② FUNCTION SWITCH
- ③ POWER INPUT TERMINAL
- ④ POWER INDICATOR
- ⑤ VIDEO OUTPUT CONNECTOR

### 1) IRIS LEVEL

Adjust the DC-type auto iris lens for an optimum picture using this volume.

### 2) FUNCTION SWITCH

#### - E/I (on/off)

When set to the ON position, the electronic iris switch automatically varies the camera's shutter to mimic auto-iris control, allowing fixed or manual iris lenses to be used in a wider range. When this switch is set to ON, turn the F/F switch OFF.



**- FF (on/off)**

This function is used for removing flicker, when camera signal format does not coincide with power source frequency being used.

**- BLC (on/off)**

This on/off switch controls backlight compensation. When set to ON, the camera will automatically try to maintain proper exposure in the specific area even if the lighting level changes.

**- AGC (on/off)**

The auto gain control switch allows the video signals to maintain a constant level. This switch is useful when using the camera at low-light levels and when lighting levels change over time. For best low light conditions, this switch should set to ON.

**- Day/Night (Auto/Color)**

Use this switch to set the camera Day/Night mode Auto(ON) or Color(OFF)

Auto : D/N mode converse automatically (AGC must set to ON)

Color : Only Color

**- AI (DC/VIDEO)**

Use this switch to set the auto iris type.

**3) POWER INPUT TERMINAL**

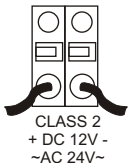
**4) POWER INDICATOR**

**5) VIDEO OUTPUT CONNECTOR**

# CONNECTIONS

---

## 1) POWER INPUT TERMINAL



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

## 2) VIDEO OUT CONNECTOR

- **BNC** : This BNC connector provides a 1.0Vp-p/75 ohms composite video Signal.

# CONTENTS OF PACKAGE

---

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. This Manual

# MANUAL IRIS LENS ADJUSTMENT

---

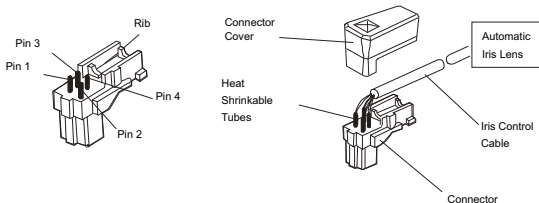
When using a manual iris lens, turn the iris ring on the lens to the OPEN position and adjust the manual iris for the appropriate range. Adjust during the brightest conditions, opening the lens to the minimum f-stop yielding a good picture under the brightest scene conditions. Do not saturate the picture.

The manual iris is used in indoor applications where lighting from windows can considerably affect the light level of the room.

# VIDEO AUTO IRIS INSTALLATION & ADJUSTMENT

The camera supports video-type auto iris lenses which adjust to changing light levels. Perform the following steps to install and adjust a video-type auto iris lens.

1. If necessary, solder the lens control wires to the connector supplied with the camera.



PIN	NAME	WIRE COLOR
1	Voltage +	Red
2	Open	—
3	Video	White
4	Ground	Black

2. Attach the video-type auto iris lens to the lens mount on the front of the camera.
3. **IMPORTANT:** Plug the connector from the lens into the auto iris jack on the side of the camera. The connector is polarized and can only be inserted into the jack one way.
4. Apply power to the camera.
5. Set the E/I dip switch (rear side on the camera) to OFF position.
6. Set the A/I dip switch (rear side on the camera) to VIDEO position.
7. Adjust the focus ring on the lens for an optimum picture. If a picture is not visible, set the lens for proper exposure by adjusting the ALC (Automatic Level Control) and the level on the lens. The ALC setting can range between AVG (average) or PK (peak). A midrange setting is appropriate for most applications.

## For ALC adjustments:

**AVG** To slow the reaction of the lens to changing light, set the range to the AVG setting to average the video level from the camera. Use when there are bright spots in the picture such as lights or glare from the sun.

- PK** To increase the speed of the lens reaction to the changing light, set the lens adjustment to PK so the lens will adjust to the brightest or peak object in the video. Use this setting if you want to see the brightest object and not the background objects.

For Level adjustments:

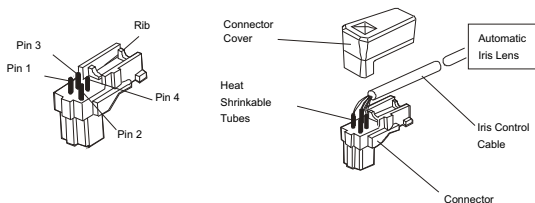
Adjust the level control for the best picture during the day. A night adjustment may not provide the proper setting for controlling the light during the day.

- Set the back focus of the camera before the final adjustment of the video level.
- If the auto iris has a gain adjustment and the picture oscillates between open and closed under bright lights, slowly turn the gain adjustment counter clockwise until the oscillating stops. Increase the light getting to The camera by adjusting the level control and re-adjusting the gain control.

## **DC AUTO IRIS LENS INSTALLATION & ADJUSTMENT**

The camera supports DC-type auto iris lenses. Perform the following steps to install and adjust a DC-type auto iris lens.

- Solder the lens control wires to the connector supplied with the camera.



PIN	NAME	WIRE COLOR
1	Damp Coil -	Blue
2	Damp Coil +	Red
3	Drive Coil +	White
4	Drive Coil -	Green

- Attach the DC-type auto iris lens to the lens mount on the front of the camera.
- Plug the connector into the auto iris jack on the side of the camera. The connector is polarized and can only be inserted into the jack one way.



4. Apply power to the camera.
5. Set the E/I dip switch (rear side on the camera) to OFF position.
6. Set the A/I dip switch (rear side on the camera) to DC position.
7. Adjust the auto iris lens for an optimum picture using the LEVEL volume on the rear side of the camera.

## **BACK FOCUS ADJUSTMENT**

---

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 focus adjusting fixing screw.
5. Adjust the back focus ring for a clear picture.
6. Tighten the focus adjusting fixing 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

---

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 focus adjusting fixing screw.
  6. Adjust the back focus ring for the clearest picture.
  7. Tighten the focus adjusting fixing 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 focus adjusting fixing screw.
  12. Re-adjust the back focus for the clearest picture.
  13. Tighten the focus adjusting fixing 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.

PROBLEM	AREA TO CHECK
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 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		True D&N		Digital D/N		
		(NTSC)	(PAL)	(NTSC)	(PAL)	
Power	Power source	DC 12V / AC 24V ± 10%				
	Power consumption	5.2 Watts		4.0 Watts		
General	Image sensor	1/3" SONY Super HAD CCD				
	Total pixels	NTSC : 811(H) x 508(V) / PAL : 795(H) x 596(V)				
	Scanning system	2:1 interlace				
	Scanning frequency	NTSC : 15.734KHz(H) x 59.94Hz(V) / PAL : 15.625KHz(H) x 50Hz(V)				
	Sync. system	Internal				
	Electronic shutter	NTSC : 1/60 ~ 1/100,000 sec. / PAL : 1/50 ~ 1/100,000 sec.				
	Resolution	540 TV Lines				
	Min. illumination	Color ( 0.25 Lux) / BW(0.01Lux) @ F1.2, 50 IRE		Color ( 0.25 Lux) @ F1.2, 50 IRE		
	Video output	1.0 Vp-p (75ohm, composite)				
	S/N ratio	More than 50dB (AGC OFF)				
	Camera Control	Dip switch				
	FUNCTION	E/I	ON / OFF			
		Flickerless	ON / OFF			
		BLC	ON / OFF			
		AGC	ON / OFF			
Day/Night		Auto / Color Fix				
Auto iris lens		DC / VIDEO				
White Balance		ATW Fixed				
Connector & etc.	Power input	2-Pin Terminal block				
	Video output	BNC connector				
	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	270g		255g			

**540TV Lines Super  
High Resolution Color Camera**

PRINTED IN KOREA

50302436A