Color CCD Box Camera
User Manual

Products: PC33C-5G, PC153C-5G

Camera With Optional Lens

Please read this manual before installing and using this camera and always follow instructions for proper use.
Save this manual away for future reference.
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Sales/Support: 1.800.335.9777 | Fax: 1.866.936.7257
Precautions

- Do not install the camera in temperature condition or humidity that is outside the specified operating range.
- Do not install the camera under unstable lighting.
- Do not touch the CCD element. If it is necessary to clean the element, use a soft cloth moistened with alcohol to remove any dust build up.
- Do not drop the camera; protect it from physical shocks.
- Do not use the camera close to an gas or oil leak.
- Do not disassemble the camera.
- Never point the camera directly at intense light.
- Do not expose the camera to rain or spill beverage on it.
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SECTION 1  Features

- 1/3” Sony® CCD image sensor
- C/CS lens mount (lens not included)
- Digital Noise Reduction (DNR)
- Digital Wide Dynamic Range (D-WDR)
- Motion detection (4 zones)
- Auto white balance
- True Day & Night function
- Video/DC drive lens support
- High sensitivity microphone
- Miscellaneous functions
- On screen Display (OSD) control
SECTION 1: FEATURES

1.1 Camera components

Front View

1. CDS
2. Microphone
3. Indicator LED

Back View

1. Audio
2. Function setup joystick
3. UTP Gain
4. Power (12 VDC or 24 VAC)
5. Video
6. RS485 and UTP terminations
**SECTION 1: FEATURES**

Side View

![Auto-Iris Jack Diagram]

**Auto-Iris Jack Pin Assignments**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Video Driver</th>
<th>DC Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+12 V</td>
<td>- Control</td>
</tr>
<tr>
<td>2</td>
<td>Iris</td>
<td>+ Control</td>
</tr>
<tr>
<td>3</td>
<td>NC</td>
<td>- Drive</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
<td>+ Drive</td>
</tr>
</tbody>
</table>
1.2 System options

The camera can be connected to a CCTV monitor or to a DVR.
SECTION 2 Installation

2.1 What’s in the box

The camera package contains:

- Camera assembly
- Instruction manual
- Hex wrench

2.2 What you need

To install the camera, you will need:

- C/CS type lens
- Mounting bracket, such as a Supercircuits SKU MB14
- Hardware and tools to attach the mounting bracket to the mounting surface
- Video, audio, and power extension cables
- 12 VDC or 24 VAC power adapter

2.3 Installing the camera

This procedure steps through the installation of a C/CS mount box camera using the Supercircuits MB14 mounting bracket (sold separately). If you are using a different
SECTION 2: INSTALLATION

mounting bracket, this procedure can serve as a general guideline for installing your equipment.

1. Using the bracket mounting plate as a template, mark the location of the mounting screw holes on the mounting surface.

2. Drill mounting screw holes into the mounting surface.

3. Attach the bracket to the mounting surface.

4. Attach a lens assembly to the camera, if necessary. Use the instructions provided with the lens.

5. If you installed an auto-iris lens on the camera, plug the lens cable into the AUTO IRIS connector on the side of the camera.
6. Loosen the directional adjustment screw so that the camera adjustment screw moves freely.

7. Attach the camera to the mounting bracket by tightening the camera attachment screw into the mounting bracket connector.

8. Tighten the directional adjustment screw to hold the camera in position.

9. Attach video, audio, and power extension cables to the connectors on the back of the camera.

**NOTE** Connectors on power cables are usually different at each end.

10. Attach the video and audio extension cables to a monitor or DVR.
11. Attach the power extension cable to a 12 VDC adapter or power source and power on the camera.

12. Verify that video from the camera can be seen on the monitor.

### 2.4 Aiming the Camera

1. While observing video from the camera, hold the camera in place and loosen the directional adjustment screw until the camera can move freely.

2. Point the camera at the center of your surveillance target. Correct the horizontal alignment of the picture, and then tighten directional adjustment screw.

3. Set the zoom and focus to produce the best framing and clarity of your surveillance target.
   
   a. If your camera has a manual iris adjustment, rotate the aperture ring to produce the best picture quality.

   b. If your camera lens has an direct drive auto-iris lens, adjust the LEVEL control to produce the best picture quality during average brightness levels of your surveillance target.
SECTION 3  SETUP Menu (OSD) Usage

The SETUP menu can be accessed and configured using the function setup joystick on the back of the camera, or through an RS-485 interface. It appears as an OSD over the video image from the camera.

<table>
<thead>
<tr>
<th>SETUP MENU</th>
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<tbody>
<tr>
<td><strong>LENS</strong></td>
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<td><strong>EXPOSURE</strong></td>
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<td><strong>WHITE BALANCE (WHITE BAL.)</strong></td>
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<td><strong>BACKLIGHT</strong></td>
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<td><strong>DAY / NIGHT</strong></td>
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<td><strong>DPC</strong></td>
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<td><strong>SPECIAL</strong></td>
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<td></td>
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<tr>
<td><strong>RESET</strong></td>
</tr>
<tr>
<td><strong>EXIT</strong></td>
</tr>
</tbody>
</table>

**NOTE** Depending on the model of your camera, some SETUP menu options may not be available.
SECTION 3: SETUP MENU USAGE

To access the SETUP menu:

1. Connect a video monitor to the video connector on the back of the camera.

2. While observing video from the camera, press the joystick in (toward the camera backplate) to open the SETUP menu.

3. Navigate through the menu system and select options as needed:
   - Rock the joystick up, down left, or right to navigate through the menu tree.
   - Press the joystick in (toward the camera backplate) to open a submenu or select (SET) an option.

3.1 SETUP menu options

LENSES
- **DC**: Select when using an Auto-iris lens.
• **Manual**: Select for manual lenses.

**EXPOSURE**

• **SHUTTER**: Select either auto or manual shutter.
  — **AUTO**: Select for auto shutter. Default: 1/60 sec
  — **FLK**: Select for Flicker shutter. Select from 1/250 ~ 1/100000 sec shutter time.

• **BRIGHTNESS**: Adjust as needed. Range: 0 ~ 255 steps.

• **AGC** (Automatic Gain Control): The higher the gain, the brighter the screen and the higher the noise level.
  — **OFF**: Deactivate AGC.
  — **LOW**: Allow AGC: 0 ~ 24dB.
  — **MIDDLE**: Allow AGC: 0 ~ 33dB.
  — **HIGH**: Allow AGC: 0 ~ 40dB

• **D-WDR** (Digital Wide Dynamic Range): Used to optimize the contrast between the brightest and darkest points in the image.
  — **OFF**: Deactivate the D-WDR.
  — **ON**: Activate the D-WDR. Range: 0 ~ 63 steps

**WHITE BAL.** (white balance)

• **ATW 1 / ATW 2**: Select this option when the color temperature is between 1800°K and 10500°K.
• **AWC → SET**: To find the optimal setting for the current luminance environment in this mode, point the camera towards a sheet of white paper then press SET.

**NOTE**  *When the environment changes, repeat this procedure.*

• **MANUAL**: Select this mode to manually set the white balance. First, set the White Balance using the INDOOR or OUTDOOR mode, then switch to MANUAL mode, fine-tune the White Balance, and press SET.

  — **COLOR TEMP**:
    - **INDOOR**: Select this when the color temperature is between 4500°K and 8500°K.
    - **OUTDOOR**: Select this when the color temperature is between 1800°K and 10500°K. (sodium light inclusion)
    - **MANUAL**: Set the appropriate color temperature that increases / decreases the red and blue color values. Monitor the color changes of the object.
      - **BLUE**: Remove or add more blue color by rocking the joystick left or right. Range: 0 ~ 255 steps
      - **RED**: Remove or add more red color by rocking the joystick left or right. Range: 0 ~ 255 steps

**NOTE**  *White Balance may not work properly under the following conditions. In this case, select AWC mode.*

1. When the color temperature of environment surrounding the subject is out of control range (e.g. clear sky, or sunset)
2. When the ambient illumination of the subject is dim.
3. If the camera is pointed at a fluorescent light or is installed in a place where illumination changes dramatically, the White Balance operation may be unstable.
SECTION 3: SETUP MENU USAGE

BACKLIGHT

- **OFF**: Deactivate the BACKLIGHT Function.

- **BLC**: Enable to select an area of a picture to view more clearly.
  - **AREA SEL**: AREA 1 / AREA 2
  - **AREA STATE**: ON / OFF
  - **GAIN**: Adjust the value between. Range: 0 ~ 255 steps
  - **HEIGHT**: Adjust the area height
  - **WIDTH**: Adjust the area width
  - **LEFT / RIGHT**: Move select area to the left or right
  - **TOP / BOTTOM**: Move select area up or down

- **HLC**: If there is a bright light installed in a limited environment, such as an apartment parking garage or gas station entrance, removing the light improves the view of car license plates.
  - **LEVEL**: Adjust the value. Range: 0 ~ 255 steps

- **MODE**: NIGHT ONLY / ALL DAY. Select HLC to activate during NIGHT ONLY or ALL DAY.

**NOTE**

Because the effectiveness of HLC depends on the amount of light area on the screen, optimize the installation angle for best HLC performance. In a dark environment, HLC is activated only when a high light is present. The HLC is not activated in bright or overly dark condition.
SECTION 3: SETUP MENU USAGE

DAY / NIGHT

- AUTO: This mode is set for color in a normal environment, but switches to B / W mode when ambient illumination is low. To set up the switching time or speed for AUTO mode.
  - D → N LEVEL: Adjust the Start Night level. Range: 0 to 255 steps
  - N → D LEVEL: Adjust the End Night level. Range: 0 to 255 steps

- COLOR: The picture is always displayed in color.

- B / W: ON / OFF. When ON, the picture is always displayed in black and white.
  - BURST: ON / OFF. Burst signal is off during B/W mode.
  - IR SMART: ON / OFF. IR GAIN: 0 ~ 255 steps; HEIGHT: 0 ~ 8 steps; WIDTH: 0 ~ 13 steps; LEFT/RIGHT: 0 ~ 7 steps; TOP/BOTTOM: 0 ~ 10 steps
  - IR LEVEL: LOW / HIGH

- EXT: This mode is used to apply a filter to external signals.

NOTE
- When using a video auto-iris lens, automatic switching between Color and B/W may not occur if the level is set too low.
- The AGC in the EXPOSURE menu is “OFF” when DAY / NIGHT menu is “AUTO”.
- If using IR illumination, install an Extra-low Dispersion Lens to improve camera focus.
- For IR models, the Day and Night menu contains only the “Auto” option.
• **DPC** (Dead pixel compensation). To set the DPC, cover the lens, then select DPC and press SET.

• **SPECIAL**
  
  — **CAM TITLE**: If you enter a title, the title will appear on the image.
    - **OFF**: No title will be displayed on the monitor.
    - **ON**: Press SET to enter the submenu. Rock the joystick up, down left or right to move to a desired letter, then press SET to select it. Repeat this method to enter multiple letters. The CAM TITLE can be up to 15 letters in length.

  ![Character Set](image)

  To position the title on the screen, move the cursor to “POS”, then press SET. Use the joystick to move the title to the preferred position, then press SET. Select “END” and press the SET to return to the SPECIAL menu.

**NOTE**

If you move the cursor to CLR and press SET, all the letters are deleted. To edit a single letter, move the cursor to the joystick left arrow, then press SET. Move the cursor to the letter being removed, then press SET. Move the cursor over the letter to be inserted, then press SET again.
• **MOTION**: If you connect an alarm device to the camera, you can monitor activities more efficiently because a signal is generated by the camera whenever a motion is detected. The motion detection signal is output through the MD OUT port.
  
  — **OFF**: Deactivate the MOTION function.
  
  — **ON**: Activate the MOTION function.
    
    **AREA SELECT**: You can select up to 4 areas to monitor for motion.
    
    **AREA STATE**: Determine whether to use the area selected.
    
    **HEIGHT**: Adjust the height of the area.
    
    **WIDTH**: Adjust the width of the area.
    
    **LEFT / RIGHT**: Adjust position of the area left or right.
    
    **TOP / BOTTOM**: Adjust position of the area up or down.
    
    **DEGREE**: Range: 0 ~ 255 steps
    
    **VIEW**: ON / OFF

• **PRIVACY**: ON / OFF. The Privacy feature allows you to hide an area of the screen.
  
  — **AREA SELECT**: You can select up to 8 areas.
  
  — **AREA STATE**: Determines whether to use the area selected.
  
  — **HEIGHT**: Adjust the height of the area.
  
  — **WIDTH**: Adjust the width of the area.
  
  — **LEFT / RIGHT**: Adjust position of the area.
  
  — **TOP / BOTTOM**: Adjust position of the area.
  
  — **COLOR**: Determine area color. You can select 15 kinds of color.

• **PARK. LINE**: The Park Line feature can be useful when the camera is installed in vehicles as a backup camera. Adjust as necessary. Parameters set the position of the parking lines. See the diagram to the right.
SECTION 3: SETUP MENU USAGE

- **LT**: 0 ~ 194
- **RT**: 0 ~ 194
- **LB**: 0 ~ 194
- **RB**: 0 ~ 194
- **F**: 0 ~ 80
- **N**: 0 ~ 80
- **T**: 2 ~ 15

- **IMAGE ADJ**:  
  - **LENS SHAD**: ON / OFF. Range: 0 ~ 255 steps  
  - **2DNR**: This function reduces background noise in a low luminance environment.  
    - **ON**: Activate DNR.  
    - **OFF**: Deactivate DNR. Noise is not reduced.  
  - **MIRROR**: ON / OFF. You can flip or rotate the image.  
  - **FONT COLOR**:  
    - **FONT**: 0 ~ 15  
    - **ID / TITLE**: 0 ~ 15  
  - **CONTRAST**: Range: 0 ~ 255 steps  
  - **SHARPNESS**: Range: 0 ~ 31 steps  

- **DISPLAY**  
  - **LCD ADJUST**: GAMMA, PED LEVEL, COLOR GAIN  
  - **USER ADJUST**: GAMMA, PED LEVEL, COLOR GAIN  
  - **CRT ADJUST**: PED LEVEL, COLOR GAIN

- **NEG. IMAGE**: ON / OFF. Set a negative image effect.
NOTE  In the LENS SHAD menu, IR models provide only the OFF option.

- **COMM ADJ** (communication adjustment): Use function to set up the communication status between the camera and an external controller. **NOTE**: PC33C-5G and PC153C-5G cameras do not support PTZ.
  - **CAM ID**: Set the camera ID number. Range: 0 ~ 255
  - **BAUD RATE**: Select either 2400 / 4800 / 9600 / 19200 / 38400 / 57600 bps.
  - **PROTOCOL**: Select either PELCO - D, PELCO - F, or NEXTCHIP.
  - **DISPLAY ID**: Display camera title on the screen.
  - **ID POS**: Use the joystick to set the position where the ID is displayed.

- **LANGUAGE**: Use to select the preferred menu language.

- **VERSION**: 21 01 10

**RESET**

- **FACTORY**: Reset the camera setting to the factory defaults.

- **RETURN**: Select this return to the SETUP menu.

**EXIT**

Press SET in the EXIT menu to save the current setting and exit the SETUP menu.
SECTION 4  Cleaning

Clean the camera lens and IR lamp shield with an approved glass cleaning solution and a lint free cloth.

- Remove all foreign particles, such as plastic or rubber materials, attached to the camera housing. These may cause damage to the surface over time.
- Dust can be removed from the unit by wiping it with a soft damp cloth. To remove stains, gently rub the surface with a soft cloth moistened with a mild detergent solution, then rinse and dry it with a soft cloth.

**CAUTION**

Do not use benzene, thinner or other chemical products on the camera assembly; these may dissolve the paint and promote damage of the surfaces. Before using any chemical product, read the accompanying instructions carefully.
## SECTION 5: SPECIFICATIONS

### Section 5 Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>PC33C-5G</th>
<th>PC153C-5G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image Sensor</td>
<td>1/3” Sony CCD</td>
<td></td>
</tr>
<tr>
<td>Total Pixels</td>
<td>811(H) x 508(V)</td>
<td>510(H) x 492(V)</td>
</tr>
<tr>
<td>Effective Pixels</td>
<td>811(H) x 508(V)</td>
<td>510(H) x 492(V)</td>
</tr>
<tr>
<td>Resolution</td>
<td>Color: 600 TV Line  B/W: 700 TV Line</td>
<td>Color: 450 TV Line  B/W: 500 TV Line</td>
</tr>
<tr>
<td>S/N (Y Signal)</td>
<td>52dB (AGC OFF, Weight ON)</td>
<td></td>
</tr>
<tr>
<td>Min Illumination</td>
<td>0.1 LUX</td>
<td>0.05 LUX</td>
</tr>
<tr>
<td>Scanning System</td>
<td>2:1 Interlace</td>
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</tr>
<tr>
<td>Synchronization</td>
<td>Internal</td>
<td></td>
</tr>
<tr>
<td>DWDR</td>
<td>OSD Control</td>
<td></td>
</tr>
<tr>
<td>Black Light</td>
<td>BLC / HLC / OFF (selectable)</td>
<td></td>
</tr>
<tr>
<td>Electronic Shutter Speed</td>
<td>1/60 sec ~ 1/100,000 sec</td>
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</tr>
<tr>
<td>White Balance</td>
<td>OSD Control</td>
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</tr>
<tr>
<td>Gain Control</td>
<td>OSD Control</td>
<td></td>
</tr>
<tr>
<td>DNR</td>
<td>OSD Control</td>
<td></td>
</tr>
<tr>
<td>D &amp; N Selection</td>
<td>OSD Control</td>
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<td>Motion Detection</td>
<td>OSD Control</td>
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<td>Mirror (H-REV)</td>
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<tr>
<td>Auto IRIS Lens Control</td>
<td>OSD Control</td>
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<tr>
<td>Blemish Compensation</td>
<td>OSD Control (DPC)</td>
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<tr>
<td>Video Output</td>
<td>1.0 Vp-p, 75 ohm LOAD</td>
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<tr>
<td>Audio</td>
<td>High sensitivity microphone</td>
<td></td>
</tr>
<tr>
<td>Lens Mount</td>
<td>C / CS</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>12 VDC / 24 VAC</td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>400mA (max) @ DC12V</td>
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</tr>
</tbody>
</table>
### SECTION 5: SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>PC33C-5G</th>
<th>PC153C-5G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>14°F ~ 113°F (-10°C ~ 45°C)</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>44°F ~ 140°F (-20°C ~ 60°C)</td>
<td></td>
</tr>
<tr>
<td>Dimensions (L x W x H)</td>
<td>4.43” x 2.04” x 2.38” (112.5mm x 60.33mm x 51.93mm)</td>
<td>7.05 oz ± 0.35 oz (200 g ± 10 g), camera body</td>
</tr>
<tr>
<td>Weight</td>
<td>7.05 oz ± 0.35 oz (200 g ± 10 g), camera body</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A Troubleshooting

Before sending the camera for repair, please follow the suggestions listed below and make sure that the camera is installed correctly. If it still does not perform adequately, please consult your supplier or contact Technical Support at 1.800.335.9777.

1. No picture on the monitor screen.
   a. Check that all connected devices are powered on.
   b. Confirm that the voltage is correct.
   c. Confirm that the power supply provides enough current to power the camera.
   d. Check that all video cables are correctly connected.

2. The picture is not clear.
   a. Check that your monitor is correctly adjusted.
   b. Confirm that the glass in front of the lens is clean. If there is dust, dirt or fingerprints on the glass, the image quality will be affected. To clean the glass use a soft, dry and non-abrasive cloth or a commercially available lens cleaning set.

3. The picture has interference.
   a. The camera may be close to a high voltage source, such as a power generator.
   b. The BNC cable may not be terminated properly.
c. The video cables are not connected properly.

This camera is a precision instrument and when treated with care, will provide years of satisfactory performance. If a problem does occur, do not open the camera to make repairs. Servicing should always be referred to your supplier.
APPENDIX B Dimensions

For cameras: PC33C-5G_CM and PC153C-5G

Dimensions:
- Height: 4.43"
- Width: 2.38"
- Depth: 2.04"