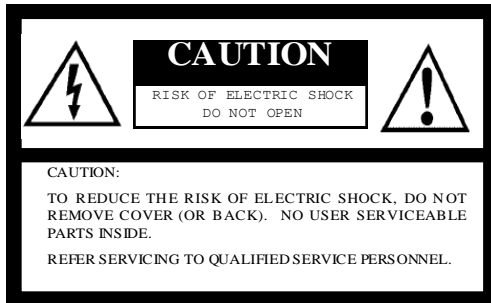


SENTECH

**STC-IE310USB-1
User's Guide**

**Industrial USB Borescope
Software Version 1.14**

Safety Precautions



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 appliance.

For U.S.A.

Warning:

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instruction manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

For Canada

Warning:

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

Product Precautions

- Handle the camera with care. Do not abuse the camera. Avoid striking or shaking it. Improper handling or storage could damage the camera.
- Do not pull or damage the camera cable.
- During camera use, do not wrap the unit in any material. This will cause the internal temperature of the unit to increase.
- Do not expose the camera to moisture, or do not try to operate it in wet areas.
- Do not operate the camera beyond its temperature, humidity and power source ratings.
- While the camera is not being used, keep the lens or lens cap on the camera to prevent dust or contamination from getting in the CCD or filter area and scratching or damaging this area.
- Do not keep the camera under the following conditions:
 - In wet, moist, and high humidity areas
 - Under hot direct sunlight
 - In high temperature areas
 - Near an object that releases a strong magnetic or electric field
 - Areas with strong vibrations

Use a soft cloth to clean the camera. Use pressured air spray to clean the surface of the glass. DO not scratch the surface of the glass.

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IMPORTANT NOTE

Thank you for purchasing the Sentech Industrial USB Borescope.

Please read this page for important notes prior to installation or use of this product.

Check to make sure the package includes all following parts:

1. The industrial USB borescope
2. CD-ROM
3. Instruction Manual

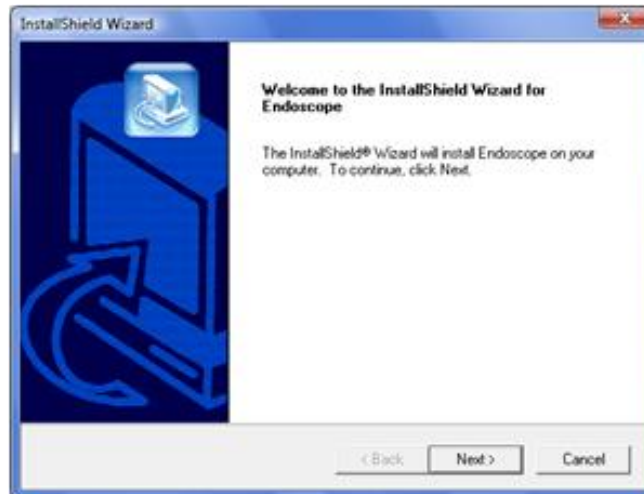
This product is **only** compatible with the following operating systems:

- Windows XP (32bit)
- Windows Vista (32bit)

Please install the software **before** connecting the borescope to the PC.

I. Installation of the Software

- A. Please insert the provided CD-Rom into the PC. The Installation Wizard will start automatically and the following window will appear:



- B. Follow the instructions for the installation setup. The installation process will be complete when the “Finish” button is selected.

II. Installation of the USB Driver

A. Please insert the USB connector of the industrial USB borescope into a USB port of the PC. The following window will appear:



B. Please follow the instruction in the window. The installation is complete when the “Finish” button is selected in the window below:



Please refer to the FAQ portion of this manual if there are any problems during this process.

III. Product Use

- A. Please insert the USB connector of the borescope to a USB port on the PC.
- B. Double-click the icon of the borescope software to start it. When the software starts there will be a moving image on the screen.
- C. The brightness level of the light is adjustable by the buttons on the hand-piece. Increase the brightness of the light by pressing the red button. Decrease the brightness of the light by pressing the blue button.

Note 1: The light level defaults to a very low light intensity when the borescope is connected to the PC.

Note 2: The brightness of the light will change to the previously used light setting when either button is selected immediately after the borescope connects to the PC.

- D. Please insert the tip of the borescope into the enclosed area to view the target.

Note 1: Please DO NOT use this for the human body.

Note 2: Please DO NOT bend the tube of the borescope more than the maximum bend radius (30mm).

Note 3: Please DO NOT move or insert the borescope with force. Please pull on the borescope gently.

- E. Please make sure that no force is applied to the USB connector while using the borescope. This will make the transmitted signal unstable causing the image to freeze.

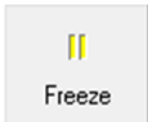
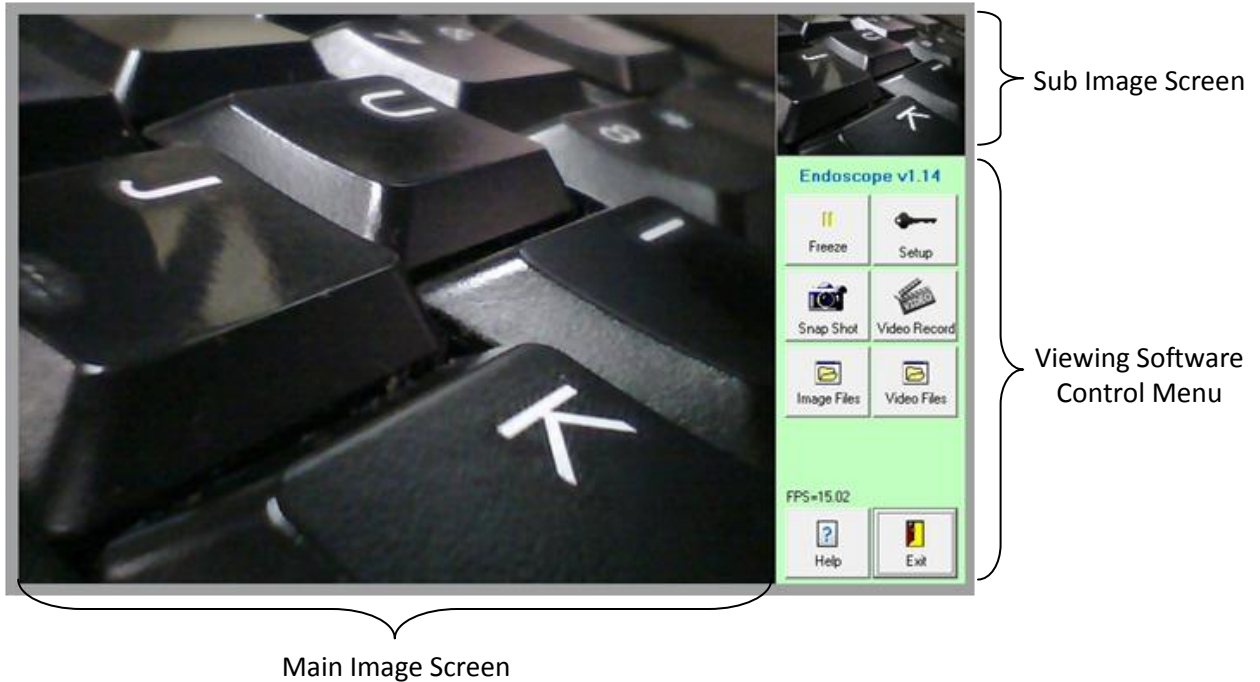
Note: If the image does freeze, please select the "Exit" button and disconnect the USB cable from the PC, then reopen the software and start over.

- F. When no longer using the borescope, close the viewing software then disconnect the USB connector from the PC.

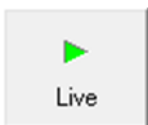
Note: The program will become unstable if the USB connector is disconnected from the PC before the viewing software is closed.

IV. Viewing Software

Main Window



This button will freeze the image in the Main Image screen; however, the live image will still be viewable in the Sub Image screen



This button will appear when the “Freeze” button is selected. This button will change the paused image back to a live image on the main image screen.



Opens the setup window



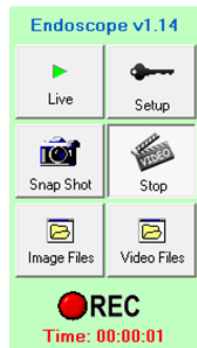
Takes a snapshot image



Starts recording video.

Note 1: Sometime during video recording a frame drop (missing image) or grainy video image may occur due to the performance limitation of the PC.

Note 2: A frame drop (missing image) may occur if another application is opened and/or being used on the PC at the same time.



Stops the video recording



Opens the image files window



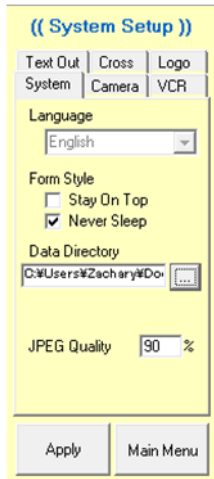
Opens the video files window.

V. Setup Window

This window is opened by clicking the “Setup” button in the Viewing Software Control Menu.

Note: To set the changes, be sure to click the “Apply” button after any changes are made.

1. System Tab: System Setup



A. Language: English is the available option

B. Form Style

1) Stay On Top: By checking this box, the software will be set to always be the front window on the screen, even when other applications are open.

2) Never Sleep: By checking this box, the PC never goes into sleep mode.

C. Data Directory: Allows the user to browse and select a folder to save captured data for this application.

D. JPEG Quality: JPEG compression quality.

2. Camera Tab: Camera Setup



A. Mirror Image: When this box is un-checked a normal image appears. A horizontal mirror image appears when the box is checked.

B. Negative: A normal image appears when the box is un-checked. A negative image appears when the box is checked.

C. Source:

1) Camera Controls

a. Brightness: Adjust the brightness of the image.

b. Contrast: Adjust the contrast of the image.

2) Saturation: Adjust the saturation

3) Sharpness: Adjust the edge enhancement

4) Hue: Adjust the hue of the image

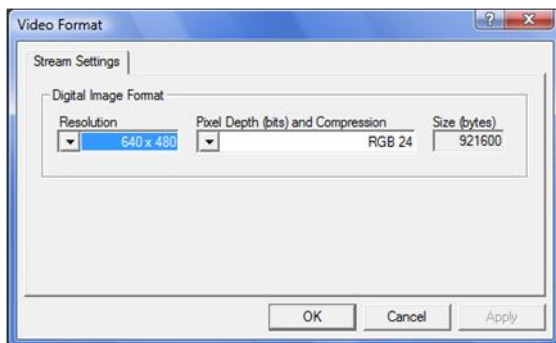
5) Exposure: Adjust the shutter speed

6) Cancel Flicker: Eliminate the flicker

7) Set Default: Restores the default settings

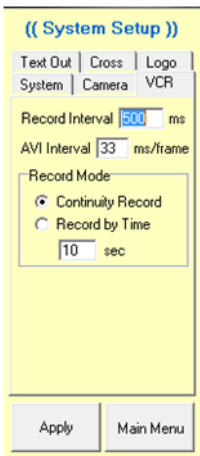
D. Format:

1) Select the “Format” button and the following window will appear:



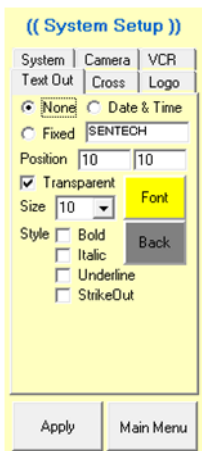
- Resolution
- Pixel Depth (bits) and Compression
- Size (bytes)

3. VCR Tab: Video Recording Setup



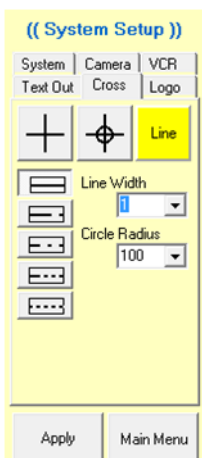
- A. Record Interval: Please select more than 100 mseconds
- B. Record Type
 - 1) Continuity Record: Records continuously
 - 2) Record by Time: Records with record time




4. Text Out Tab: Allows for formatting of the text that appears on the main image screen.



- A. None: No text
- B. Date & Time: Appears date and time
- C. Fixed: Appears text with below text box
- D. Position: Position of the upper left of text
(Upper left of the main image: 0,0, Lower right of the main image: 640,480)
- E. Transparent: Background of the text is transparent
- F. Size: Size of the text
- G. Style: Please select the font of the text
- H. Font: Please select the color of the text
- I. Back: Please select the color of the background

5. Cross Tab: Cross line setup



- A. Style Icon Buttons
 -  Creates a cross that overlays on the main image screen.
 -  Creates a cross with a circle on the main image screen.
 -  Allows the user to change the color setting of the line. The color of the button indicates the current color setting.

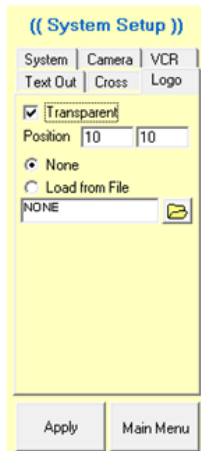


B. Line Style: Each button indicates the different styles that can be formatted for the lines (observe the adjacent image).

C. Line Width: Select the width of the line. There are preset sizes available in the drop down field or the user can manually type in the desired size.

D. Circle Radius: Select the radius size of the circle. There are preset sizes available in the drop down field or the user can manually type in the desired size.

6. Logo Tab: Logo setup



A. Transparent: Background of the logo is transparent

B. Position: Position of the upper left of the logo
(upper left of the main image: 0,0; Lower right of the main image: 640, 480)

C. None: No logos

D. Load from File: Allows the user to browse and select a logo from file by selecting the file icon button.

VI. Image File Window

The software allows for a maximum of 9 of the newest captured snapshot image files to appear as thumbnails on the main window.



To open an image at a maximized view, double-click the image thumbnail in the image file window. Then to return to the thumbnail view double click the enlarged image.

A. Compare with Files: Compare image files.

The thumbnail image mode has a blue frame and red frame. Move to the colored frames over the thumbnails that are to be compared. Then click the "Compare with Files" button. This will magnify and position the two selected thumbnails next to one another for comparison. To return to the thumbnail screen mode re-click the "Compare with Files" button.



B. Compare with Live: Compare the image file and live image.

With the red frame, highlight the thumbnail image file that is to be compared with the live image. Then select the “Compare with Live” button. A maximized view of the selected thumbnail image will appear on the left side of the main image window, while the live image will appear on the right side. Please observe an example of this below:



To return to the thumbnail image file screen, re-click the “Compare with Live” button.

C. Delete: Deletes the file highlighted by the red frame.

D. Delete All: Delete all image files from the image file folder.

E. Home: The thumbnails of the 9 newest snapshot images will appear on the thumbnail image file screen.

F. End: The thumbnails of the 9 oldest snapshot images will appear on the thumbnail image file screen.

G. PgUp: Allows the user to scroll to more recent thumbnail image files on the image file screen.

H. PgDn: Allows the user to scroll to older thumbnail image files on the image file screen.

I. Arrows: Moves the red frame to the adjacent image (right, left, up or down).

J. Floppy Disk Icon: Saves the file.

K. Main Menu: The screen returns to the live image.

VII. Video File Window

The software allows for a maximum of 9 of the newest captured video files to appear as thumbnails on the main window.



To open and view a video file, double-click the image thumbnail in the thumbnail image file window. Then to return to the thumbnail view double click the enlarged image.



A. Highlight a video thumbnail with the red frame then press this button to play the video.



B. When a video is playing, press this button pause it.



C. Exports the video to an AVI file.



D. Stops the video



E. Plays the video on repeat. Re-click the button to deactivate the repeat mode.



F. Deletes the video file highlighted by the red frame.



G. Saves the video file highlighted by the red frame.



H. Rapid Rewind



I. Rapid Fast-forward



J. Normal Rewind



K. Normal Fast-forward

VIII. Frequently Asked Questions

Q. The installation of the driver failed. What should be done?

A. Please follow the following steps to make sure that you have properly installed the driver:

1. Select the [Back] button to return to the window below. Select “Install from a list or specific location (Advanced)” then select the [Next] button.
2. Select “Don’t search. I will choose the driver to install”, then select the [Next] button.
3. Select and highlight “Sentech Borescope Cam”, then select the [Next] button. If multiple “Sentech Borescope Cam” appear on the driver list, then please select the first entry at the top of the list. Or select the latest version when the version numbers appear on the list.
4. Press the [Continue Anyway] button.
5. Select the [Finish] button.

Q. Why does the borescope not work?

A. Please review the following troubleshooting steps:

1. Was the borescope’s USB driver installed correctly?
The borescope’s USB driver has to be installed **before** the product is used. Please refer to the previous FAQ section, “Installation of the driver failed. What should be done?” to install the USB driver.
2. What operating system is on the PC?
The borescope can **only** be used with Windows XP (32bit) / Vista (32bit). The borescope CANNOT be used in any other operating system.
3. Does the PC have USB 2.0 High Speed capability?
When the PC has USB 2.0 High Speed capability, “Enhanced”, “EHCI” or “Standard Enhanced” should appear in the “Universal Serial Bus” controllers of the device manager.
However, sometimes the borescope does not function because it cannot get enough transfer speed, even though the PC has USB2.0 High Speed capability.
4. Is the borescope connected to the USB port of the PC or the USB ports of the PCI extend board?
Generally, the chipset that is equivalent to the USB 2.0 (i.e. Intel ICH4, ICH5, ICH6, etc.) can transfer faster than that of a USB 2.0 controller chip that is used for the PCI extend board. It is recommended to use the borescope with an Intel chipset (ICH4, ICH5, ICH6, or newer).
5. Is there any other USB equipment connected to the PC?
When there is other USB equipment connected to the PC, this will occasionally prevent the borescope from getting an image because there is not enough transfer speed. Please check to make sure that other USB equipment is disconnected from the PC.
6. Is the borescope connected to the USB HUB?
It is NOT recommended to use the USB HUB. When a USB HUB that is not supported by USB 2.0 is used, the borescope image will not appear. If it is necessary that the USB HUB is used, then please use a USB HUB that is supported by USB 2.0.
7. Is the borescope connected to any extended USB cable?
Please DO NOT use an extended USB cable. The borescope does not work correctly when used with an extended USB cable because the USB signal is red.
8. The borescope does not work with another PC.
The current PC has some cause of not work correct when the borescope works fine with another PC.

Q. Why does the image has horizontal boundary lines?

A. Sometimes horizontal boundary lines may appear on the top and bottom of the image. The phenomenon is called tearing, which is when the image overwrites while it appears on the monitor. This is not borescope issue.

Q. How many borescopes can connect to one PC?

A. The number depends on the usage and environment of the borescopes.

Multiple borescopes can connect to the PC at same time; *however*, the image CANNOT be received from more than ONE borescope at a time. In other words, it is possible to connect more than one borescope to the PC, then one must select which borescope to get the image/video from.

Please note that multiple borescopes can be used on a PC only if the performance level of the PC can support it.

Due to the standard limits of USB transfer speed, the maximum number of borescopes that can connect to the PC with 15fps is four.

However, it is possible to connect more than four borescopes to the PC when the borescope's operation speed is reduced. To achieve this reduce the frame rate settings.

When more than four borescopes need to connect the PC with 15fps, use them with the PCI extended board to improve the capability.

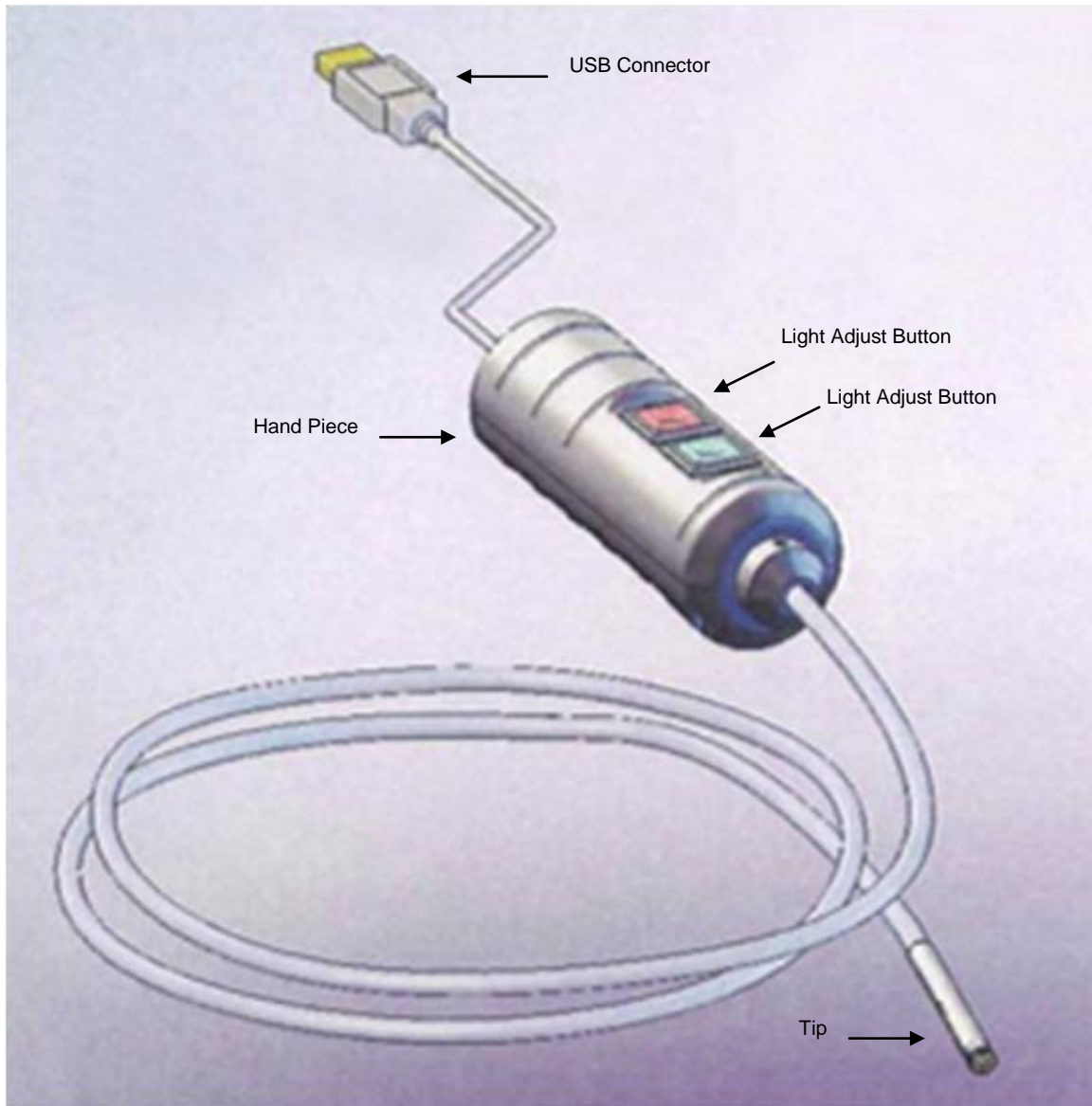
Q. Why is the image frozen?

A. Please check that the USB connector is connected to the USB port securely. Please select the "Exit" button then disconnect the USB connector of the borescope from the PC and start over.

IX. Product Specifications

Part		STC-IE310USB-1
Camera	Image Sensor	1/10", CMOS
	Effective Pixels	640 x 480
	Cell Size	2.2 x 2.2 μm
	Frame Rate	15 fps
	S/N Ratio	35 dB
	Video Out	USB 2.0
	Shutter Speed	Adjustable by software
	Gain	Auto
	White Balance	Auto
Lens	Focal Length	1.66 mm
	Aperture Ratio	F 2.8
	TV Distortion	Less than 1%
	Angle of View	More than 50 ^o
	Depth of field	30 to 100 mm
Light	Light Source	White LED (6pcs)
	Illumination	More than 40 Lux at 100 mm
Tube	Tip Diameter	6 mm
	Serpentine Tube	Interlock
	Tube Length	1.5 m
	Minimum Bend Radius	30 mm
	Tensile Strength	30 N (3kgf)
Environmental Conditions	Operating Temperature	0 to 50 ^o C.
	Storage Temperature	-20 to 80 ^o C.
	Operating System	Windows XP / Vista (32bit)
Waterproofing	Tip and Serpentine Tube	Equivalent to IP67
	Hand Piece	No waterproofing
RoHS		RoHS Compliant

X. Product Drawing



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