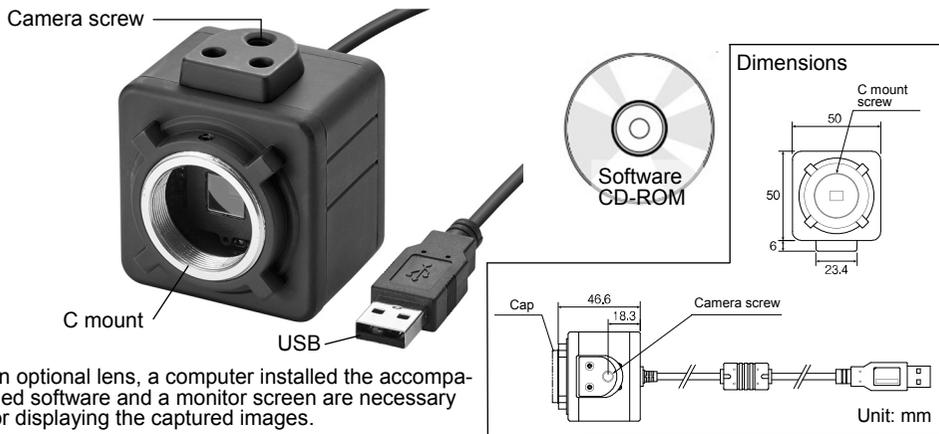


## L-835 USB CAMERA

Thank you for purchasing the HOZAN L-835 USB CAMERA. With proper care and handling, this fine instrument will provide years of trouble-free operation. Please read this entire instruction manual carefully before attempting to place this instrument in service. Please keep this instruction manual available for reference.

### Identification of parts and contents



An optional lens, a computer installed the accompanied software and a monitor screen are necessary for displaying the captured images.

### Specifications

Image sensor	1/2.5" CMOS	Dimensions
Interface connector	USB 2.0	50(W) X 50(H) X 46.6(D) mm w/o projections
Display resolution (max.)	2592 X 1944 (5000000 picture elements)	Weight
Save resolution (max.)	Still picture 2592 X 1944 (5000000 picture elements) Video 1280 X 960 (1200000 picture elements)	170 g
Frame rate	Max. 30 fps, 10 fps when 5000000 picture elements	■ Cord length: 1.8m
File formats	Still picture JPG/BMP/PNG/PDF Video AVI	
Lens mount	C mount	
Rating	5 Vdc through USB	
Power consumption	0.35 W	
Computer requirement	OS: Windows 10/8/7/XP*(32bit & 64bit) CPU: 1GB or over Main memory: 20GB or over Availability of hard disk: Intel Core 2 Duo 1.6 GHz or over recommended USB receptacle: USB 2.0	*We are not responsible for compensation and support when a problem occurred during use on the OS. Microsoft's support of which has ended.
Software	HOZAN USB cam software** (language: Japanese/English/Chinese) Functional explanation P6 to 12.	**Animation reading isn't made of software of the accessory. Separately, animation software such as Windows Media Player is needed.

## Warning and caution symbols

These symbols are used throughout the instruction manual to alert the user to potential safety hazards as follows:

 **Warning** ... Notice when incorrect handling could cause the user's death or serious injury.

 **Caution** ... Notice when incorrect handling could cause injury to the user or material damage.

Even if the instructions do not have  **Caution** mark, there are some possibilities for a serious situation. Follow the instructions.

## Precautions

This USB camera is for expanding inspection. Do not use for any other purpose.

### **Warning**

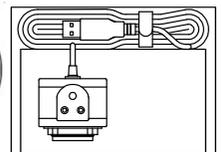
1. Do not soak in liquid such as water, chemical and oil. Do not operate with wet hands. These could cause a short circuit, a electric shock or a fire. These could cause malfunction.
2. Do not use near a heating element or a flammable thing. The USB camera could burn.
3. Cut off the connection when lightning. This could cause a shock.
4. Do not modify or reassemble this product. This could cause a fire, a shock or an injury.
5. Connect to the computer following the instructions by that manufacturer..
6. For your health, avoid prolonged use and give eyes a rest.

### **Caution**

1. Do not use or store this product, a computer and other device where;
  - +vibration exists
  - +static electricity or electrical noises generates
  - +a lot of dust exists
  - +strong magnetism generates
  - +it is high temp./humidity
  - +exposed in direct sunlight
2. Do not pull the cable of the USB connector when remove from the computer. This could cause malfunction.
3. Pay attention when attach or detach the lens in a state that the L-835 is connected. The connecting cable could be stranded causing malfunction.
4. If settle in an inspecting equipment, put on a stable place.
5. When it is out of use for a long period, disconnect from the computer and store with the cap.
6. Do not turn towards the direct sunlight while combining with the lens. The image sensor could be damaged.
7. These cause a malfunction of the C mount;
  - +to over screw in when mount a lens
  - +to lift holding only the camera under state of combining with a heavy lenses such as L-815/L-816

## Make sure of the contents

Make sure that these items are in the package before use. Lenses are not contented. Please combine with a lens selecting among optional lenses mentioned on page 13.



# Preparation

## Installing the driver

Not necessary. The driver is installed automatically when the L-835 is connected to the computer for the first time. Start the software after the driver installation is completed.

## Installing the software

Prepare the accompanied software CD-ROM, a computer with a monitor and so on. Refer to page 1 for the requirement of the computer.

### Regarding HOZAN USB cam software

HOZAN USB cam software is the exclusive software for L-835, simply and easily operated. Photographing still pictures and videos and editing still pictures, and measuring can be done easily. There are two type of software. They are "HOZAN USB cam software", in accompanied CD-ROM, and "HOZAN USB software2", gotten from our website. Inspection work making full use of multi-windows (see p13) can be done if install "HOZAN USB software2".

\*HOZAN USB software2 may recognize cameras other than L-835 under certain PCs. If so, ask the administrator of those PCs.

1 Put the CD-ROM accompanied into the CD drive of the computer, and double-click "HOZAN USB cam Install. exe.



HOZAN USB cam Install. exe

2 The dialog box will open. Select the language, then push [OK].

3 The setup wizard will open. Operate following the direction on the screen.

4 The icon as the illustration appears when the application is trouble-freely installed. Double-click this icon to open the application program.



\* If Windows demands to input the administrator's password when the software installing, ask the administrator.

## Regarding update

The software is occasionally updated. Please get the new version from our website. Uninstall the former software before installing the new version. Please check update, it may be not so frequent, of the firmware too in our website.

## Uninstalling the software

### For Windows 7

To uninstall (to delete the application software), select [Start]—[All programs]—[HOZAN USB cam software], then click [Uninstall HOZAN USB cam].

### For Windows 8

On the start screen, right-click [HOZAN USB cam software], then click the uninstall button.

### For Windows 10

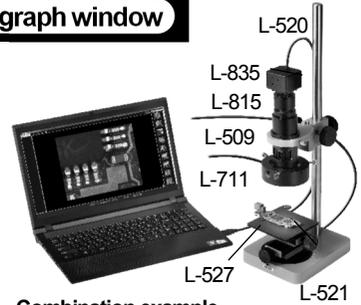
On the start screen, select [Start]—[Control panel]—[Program]—[Program & function]—[HOZAN USB cam software], then click [Uninstall HOZAN USB cam].

### Start guidance

- 1 Attach a lens sold separately to the L-835.  
Use illumination if necessary.
- 2 Connect the L-835 to the computer in which  
HOZAN USB cam software is installed.
- 3 Double-click the icon of "HOZAN USB cam  
software" to start the software.  
That linguistic initialization is Japanese.  
First, select the language to be used  
(refer to explanation on page 5).



HOZAN USB cam software



### Combination example

L-835 + Zoom lens (L-815)  
+ Holder (L-509) + LED ring light (L-711)  
+ Base (L-521) + Long post (L-520)  
+ XY stage (L-527)

Start the software in the state that the L-835 is connected to the computer. If connect the L-835 during the software is opened, the L-835 is not recognized and photograph function is not used. Once close the software, then start after connect the L-835.

### Application guidance

The software consists from the preview screen and the edit screen, which are switched with the icons in the upper left of the screen.

Regarding the each function, details are explained on and after the next page.



Photograph window



Edit window

### [Photograph window]

#### ① Setting window

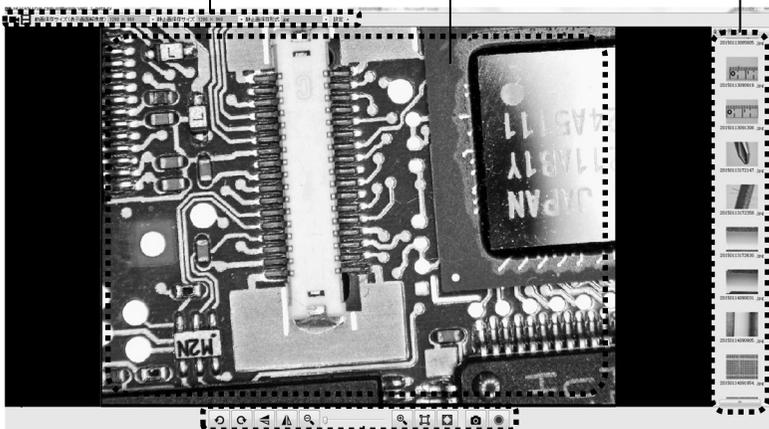
Setting a preservation place, image quality, language, display size, save format and save resolution.

#### ② Preview window

An image being captured is displayed.

#### ③ Thumbnail window

Saved multiple images are displayed.



#### ④ Preview tool palette

There are buttons for basic operation, viz. turn, expand/reduce, photograph. See the clause "Preview tool palette" on page 7 for details.

## ① Setting window

Settings ▾ Various settings

### [Setting]

Set a preservation place for images, videos and PDFs manually.



### [Video Capture Filter]

Adjust tone of the displayed pictures. Only “white balance” and “Exposure” correspond to “automatic”. Other items are set manually, not turned to “automatic”.

Operate only exposure treatments in the tab “Camera Control”. Other than exposure treatment must be done in the tool pallet (see p.7). Otherwise, proper image data can not be gotten.



“Backlight Comp” can be used when “exposure” in the tab “Camera control” is set to “automatic”.

### [Language]

Select the language to be used.



### [Software Information]

The version of the software and other HOZAN products are informed.



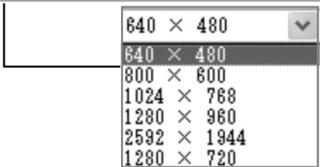
Save Format .jpg ▾

### Setting the save format for still pictures

Select among PDF, BMP, JPG and PNG.

Video storage size(Display resolution) 1280 × 960 ▾

### Setting the video storage size (display resolution)

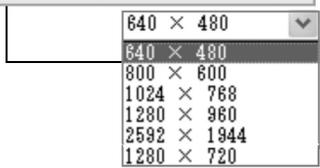


The video storage size and display resolution on the preview window are decided by this setting.

- \*The default value is 1024 X 768.
- \*2592 X 1944 can not be selected.

Save Resolution 1280 × 960 ▾

### Setting the still picture save resolution

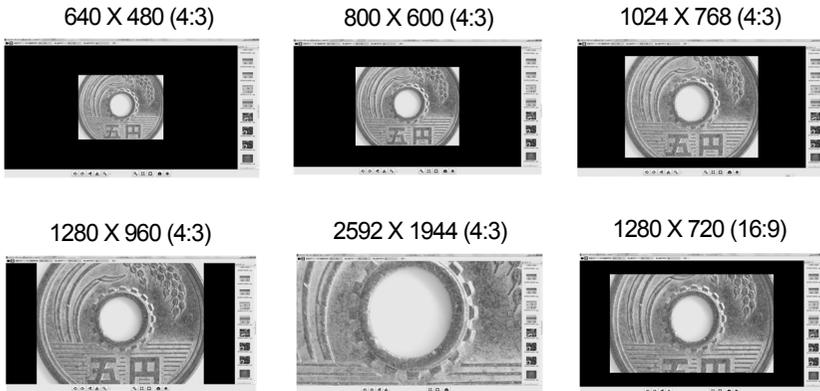


The still picture save resolution is decided by this setting.

- \*The default value is 1024 X 768.

## ② Preview window

The preview window's size is decided corresponding the resolution selected at "Video save size (display resolution)". Each aspect ratio is noted in the parentheses.



\*These are displayed examples on a 24-type wide screen which is set in resolution of 1920 X 1080.

## ③ Thumbnail window

All the saved pictures and videos are displayed.

All

- All
- Photo
- PDF
- Video

Also categorized reference is possible.

20150513183847.jpg

Right-click on the picture. These windows below are displayed.

20150513183923.jpg

- Open
- Open directory
- Copy
- Paste
- Delete
- Rename
- Refresh

- Pictures are displayed in the other window\* such as Windows Photo Viewer. Videos are previewed through the other window such as Windows Media Player.
- The folder in which the pictures are saved will be opened. The folder "Picture" will be opened by the basic setting.
- The selected picture is copied.
- The copied picture is pasted.
- The selected picture is deleted.
- The file name of the selected picture is altered.
- The information is updated. (Always update after editing pictures.)

\*Depends to the software installed in the computer.

## ④ Preview tool palette

The buttons for the basic operation such as turn, expand/reduce, photograph.

	Turn 90 degrees counterclockwise		Zoom in
	Turn 90 degrees clockwise		Return to the original size, selected as the video save size.
	Reverse vertically		Reduce into the most suitable size for the window to display the entire image
	Reverse horizontally		Photograph still pictures
	Zoom out		Photograph videos (start/stop)

### Hint

- When the palette is in the state as shown below, you can photograph with expanding/reducing since the set video save size (display resolution) is consistent with the set still picture save resolution.



- When the palette is in the state as shown below, you cannot photograph with expanding/reducing since the set video save size (display resolution) is not consistent with the set still picture save resolution.



- If select 1280 X 720 or 2592 X 1944 for [video save size], you cannot photograph with expanding/reducing nor save videos.



- The saved images are given file names as photographed year, month, day, time.



[Example]  
20140912141203.jpg  
(2014, Sep, 12, 14:12:03)

[Edit window]

③ Measurement tool palette

① Document tool palette  
for inserting/printing/deleting the image

② Preview window  
for displaying the specified image

④ Thumbnail window  
for displaying the multiple saved images

⑤ Edit tool palette  
There are buttons for basic operations such as turn, expand/reduce, photograph. See the clause [Edit tool palette] on page 10 for details.

## ① Document tool palette

There are buttons for basic operation such as turn, expand/reduce, photograph.



To overwrite the editing image.



To name and save the editing image.



To open an image (PDF/BMP/JPG/PNG) from a folder.



To save the displayed editing image in PDF.



To print by the connected printer.

The icons as shown in the right illustration appears, but these functions, printing multiple images in one, are not effective on this camera.



To delete the displayed editing image.

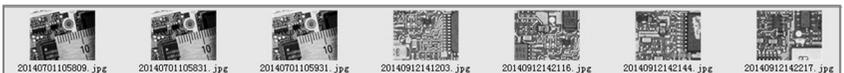


To display the files in a list, as [file name, type, last modified time, size, resolution].

Name	Type	Last Modified	Size	Resolution
20150116093242.jpg	.JPG	2015/06/01 16:47:33	44 KB	1024*768
20150119111927.jpg	.JPG	2015/06/01 17:59:54	50 KB	1024*768
20150119142918.jpg	.JPG	2015/01/19 14:30:02	106 KB	1017*766
20150421090453.jpg	.JPG	2015/04/21 9:05:06	49 KB	1024*768
20150421113002.jpg	.JPG	2015/04/21 11:30:02	47 KB	1024*768



To display reducing in thumbnails.



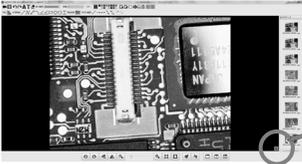
## ② Preview window

To display all the saved still pictures and compare on the division screen.

\*Videos (AVI) are displayed by the other window (such as Windows Media Player).

This depends to the software installed in the computer.

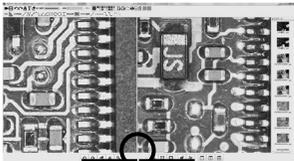
### Displaying in one screen



Double click the picture to be inserted from the thumbnail window.

1

### Displaying in two screens



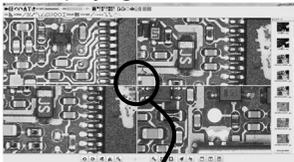
Push this button to divide the screen in two.

1 2



Push this button to divide the screen in four.

### Displaying in four screens



1 2  
3 4

When click the center of one of the divided screens, the letter of that number becomes red from blue. Double click the desired picture from the thumbnails to insert into the selected screen.

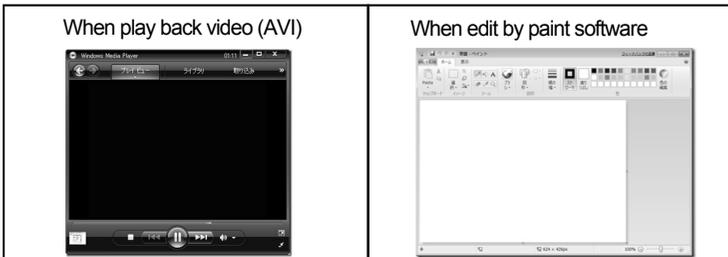


Push this button to return to the screen in one.

The picture which was selected when displayed on the screen in two/four (that letter of number was red) is displayed.

### Hint

These two functions at the edit window are displayed in the other windows.



Windows Media Player: Play digital media including music, videos, CDs, and DVDs.  
Paint: Create and edit drawings.

## ③ Measurement tool pallet

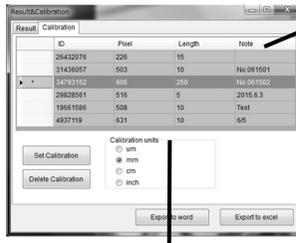
This software has the measurement function.  
Prior to using measurement function, carry out calibration as the procedures below.

### How to calibrate

1 First, photograph a ruler and such in a still picture as the basis. Open the edit window. Select and display the image to be the basis.

2 Click  button of the edit window to display the calibration window.

Select the calibration tab. There is no datum when in the initial state.



Items

ID: decided automatically

Number of pixels (pix): displayed pixels correspond to the measure

Length: Enter the actual measure

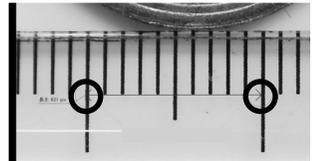
Note: Name that calibration value

Calibration units

Set the unit of the measure of basis.

3 Display the image saved as the basis selecting from the thumbnails. Click two points on the image to decide the starting and end points of the basis measure.

[Example]  
Select two points at an interval of 10 mm on the rule.



4 The basis selected at 3 is displayed on the calibration window. Click and fill "Length" and "Note" (not always need), then click "Set Calibration" and close the calibration window to complete. To use a registered calibration value, click the blank belong to that calibration value to be used and push the "Set Calibration" button.

[Example]  
When the measure of 10 mm is basis, enter "10" in Length, and select "mm" for Calibration units.

Asterisk is indicated at the calibration value actually being used.



### Regarding alteration and deletion of calibration value.

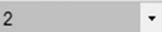
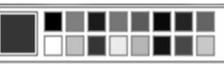
The calibration value must be readjusted whenever the magnification or working distance, to the object from the lens, is fluctuated.

Open the calibration window and click the calibration value to be altered to use a different calibration value, then click "Set Calibration".

Use the "Delete Calibration" to delete the registered calibration values.

\*The calibration value actually being used can not be deleted.

## Functions of the tool pallet

Basic Operations		Operations in Measurement Function	
	Undo.		Straight line: measuring distance of two points.
	Cancel the undoing.		Folded line: measuring distance of plural points(*2).
	Decide font and point of letters(*1).		Distance of center of circles: measuring distance of center of two circles and radius, circumference and area of each circle.
	Fill texts.		Arc: measuring length, radius, degree and area of a figure formed with arc.
	Delete letters.		Angle: measuring angle between two segments formed by three points.
line type 	Decide character and width of segments displayed in measurement and drawing functions.		Angle by four points: measuring angle formed by four points.
line width 2 			Rectangle: measuring horizontal and vertical dimensions, circumference and area of rectangle.
color 	Decide colors displayed in measurement and drawing functions and text filling.		Polygon: measuring circumference and area of polygon formed by plural points (*3).
	Drawing segments.		Circle: measuring radius, circumference and area of circle.
	Drawing one-way arrow.		Distance of parallel lines: measuring distance of parallel lines.
	Drawing two-way arrow.		Drag image when it is larger than window.
	Drawing folded one-way arrow.		Drag measurement results, text and such.
	Drawing folded two-way arrow.		

\*1 Effective against all letters being edited except the inputted texts. \*2 Decide the end point by right-click.

\*3 A polygon is completed when the right-clicked point links with the start point.

- These settings by the functions on the tool pallet can be altered any times if before saved.

## How to save the measurement results

Click  button to display the calibration results window.

Measurement results are automatically displayed on this window.

These are saved in a Word or Excel file. Click the "Word Export" button or "Excel Export" button.



### ③ Thumbnail window

All the saved pictures and videos are displayed.  
Refer to the explanation for the thumbnail window on page 6.

### ④ Edit tool palette

The buttons for basic operation such as paint edit, cut, screen display.



	Turn 90 degrees counterclockwise		Adapt size for the window to display the entire image
	Turn 90 degrees clockwise		Edit
	Reverse vertically		Clip
	Reverse horizontally		One screen
	Zoom out		Two screens
	Zoom in		Four screens
	Full size, selected as the video save resolution		

## Magnification table

Magnifications gotten by the L-835 is combined with interchangeable lenses

Combination		Magnification * x	Field of view mm	Working distance mm
L-802-2	Without ring **	2.9 to 11	60 x 45	330
		6.0 to 24	29 x 22	175
	+ L-818	14 to 59	12 x 9.1	85
	+ L-819	29 to 11.5	5.9 x 4.5	53
	+ L-818 + L-819	37 to 150	4.6 x 3.5	45
L-815		8.7 to 250	20 x 15 to 2.7 x 2.1	105
L-816		16 to 500	10 x 7.6 to 1.4 x 1.0	105
L-600-12		min to 15	∞ to 45 x 34	∞ to 100
L-600-35		min to 17	∞ to 40 x 30	∞ to 250

\* Using 24-type widescreen monitor set on resolution of 1920 x 1080 pixels.

\*\* When the ring, effective length 3 mm, at the foundation of the lens components detached.

## Regarding HOZAN USB cam software2, multi-window system

Multiple software of HOZAN USB cam software2 can be booted up if install this software (see p3). Hence you will be able to use multiple L-835s simultaneously on a sole computer.

Please download this software from our web site. Also browse using examples there.



## Related products

The L-835 does not have lenses. Please use combining with these related products.

### • Lenses

#### L-802-2 Lens unit

#### L-818 Extension ring

#### L-819 Extension ring

A reasonable priced C mount lens. High magnifications are gotten by using extension rings.



L-802-2



L-818



L-819

#### L-815/L-816 Zoom lens

Adjust the magnification freely in accordance with the purpose.



L-815



L-816

#### L-600-12 Lens

#### L-600-35 Lens

A high-resolution lens appropriate for observation of rather low magnification. Has focus and aperture rings.



L-600-12



L-600-35

#### L-845 Adapter kit

For connecting a microscope and a digital camera. Images through a microscope can be photographed.



L-845

#### L-846 Lens unit

#### L-846-1/2/3 Adapter

For connecting a microscope and a digital camera. Whole images seen through a microscope can be photographed in high-definition.



L-846



L-846-1/2/3

## Related products

### • Others

#### L-509 Stereo head holder

\* Cannot be used for the L-835 combined with L-600-12 or L-600-35.



L-509

#### L-521 Standard table

#### L-520 Long post

Use the standard table interchanging the original post into the long post if the working distance becomes long.



L-521

L-520

#### L-523 Long type arm

#### L-525 Large table

Use these devices for observation of large objects.



L-523



L-525

#### L-519 Flexible arm

Locate and angle the camera freely, vertically, horizontally.



L-519

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