Beam Profiler with M^2 platform software

LaseView

&

Beam profiler for large diameter and high-power

LaseView-LHB-25

LaseView-LHB

LaseView-LHB-100

LaseView-LHB-200

User guide manual

Kokyo

Kokyo, Inc.

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1. Notes

■Notes about the manual

1. Before using the device, please read carefully this book, and proceed correctly following the instructions.
2. Keep this book preciously so that you can check it any time you need.
3. If you use the product beyond its intended uses or specs, please acknowledge that we can't warranty the safety.
4. Respect carefully the instructions of this book relative to safety.
5. The content of the book may change without prior notice.
6. The pictures displayed in this book are for illustration purpose and may be partial or schematized.

Please acknowledge beforehand that our company can't be held responsible for any loss of profits resulting from the use of the product.

■About the warning and caution signs in this book

⚠

Risk of death or serious injury from improper use while not respecting these instructions.

⚠

Risk of injury or damage to property from improper use while not respecting these instructions.

■For a safe use

⚠

- Operation during the following states may cause fire or electric shock. Cancel the operation and shutdown the power of the device. In case it need a repair, please contact us through the contact information at the end of the book for an exchange. For your safety, refrain from disassemble, modify or repair by yourself.

・Smoke is going out of the device, its surroundings are hot, the device produces a strange noise or smell
・In the case where water or matter has penetrated into the device
・In the case of damages following a fall or hit

- Do not place the product on a unstable place (on a loose stand or an inclined plan) as it may fall and provoke or get damages.
- If the light reflected from the entrance window penetrates someone's eyes, it may result in blindness. Moreover, it may get easily flammable materials to burn. As 4-8% of the input light is reflected, when you want to measure high-power lasers, make sure to block this reflected light in order to avoid damages on surrounding materials.

⚠

- Do not place near a source of oily smoke or steam where it could get clogged up and cause fire or electric shock.
- Do not let the device in a high-temperature place such as direct sunlight, inside a car or near a fire. As it can affect the internal components, it may cause a fire.
- Do not operate in conditions where the heat of the device can't evacuate, like wrapping the device in a cloth. Some parts may get deformed and start a fire.
- Prevent the device from falling or being hit, it may cause a dysfunction.
- Do not connect cables with wet hands. It may cause electric shocks.
- When power is on, do not touch during a long time the device. Its temperature rises so that doing so may cause superficial burns.

Other notes

- If you input a beam with a higher power than acceptable according to the specification of the device, it may deteriorate its sensor and other parts. Even when the device if turned off, do not input such a powerful laser.
- If you input a beam with an incident angle greater than the tolerance angle specified for the device, or if the beam divergence angle (respectively

convergence angle) is greater than this tolerance angle, it may damage the sensor or other parts. Even if it doesn't cause damage, it may introduce ghost images which will prevent the device from performing correct measurements.

- Do not shake or rub the entrance window. If you damage it, it may reduce the measurement accuracy.
- To remove dust from the window, rather use a soft air-duster or assimilate. If you apply a too strong pressure on the window, it may cause a deformation and result in a loss of accuracy.
- To remove dirt from other parts of the device, wipe with a soft cloth or a tissue paper. In this case, do not use alcohol, paint thinner, benzine and so on. It may alter or remove the surface film.
- If you operate the camera near a radio or TV receptor, it may cause reception interference.

■About export control

This product is regulated by the Foreign Exchange and Foreign Trade "Catch-all control" Law. Except for the territories listed in the Export Trade appended Table n°3 (27 countries applying Strict Export Trade Control※), if it appears that the device may be used in practice for the development, etc, of massive destruction weapons (like nuclear weapons), or conventional weapons in the countries of destination, you need to receive in advance the authorization from the Minister of Economy, Trade and Industry. In accordance with the relevant laws and regulations, please understand that it is your responsibility to obtain the mandatory authorizations.

Reference: Trade Control Department of the Ministry of Economy, Trade and Industry

http://www.meti.go.jp/policy/anpo/index.html

※Ireland, United States, Argentina, Italy, the United Kingdom, Australia, Austria, the Netherlands, Canada, Greece, Switzerland, Sweden, Spain Republic of Korea, the Czech Republic, Denmark, Germany, New Zealand, Norway, Hungary, Finland, France, Bulgaria, Belgium, Poland, Portugal, Luxembourg

■About warranty

Our company promotes paperless solutions, therefore we refrain from sending warranty form, and we manage the warranty period starting on the shipping date. For more information, please contact us through the contact information at the end of the document.

2. Operating environment

- OS: Windows 8.1, Windows 10, Windows 11
- CPU speed : at least Intel Core i3 2GHz or equivalent
- Free memory : at least 512MB

※ This is not a warranty of operation on all computers fitting the above description.

※ Depending on the version, the Guide illustrations may slightly differ from the actual screens but it can be used without any problem.

3. Overview and components

LaseView-LHB is a beam profiler for large-diameter, high-power lasers by using the corresponding projection on a window. It can pre-process a large reduction of the speckles (pattern of bright and dark spots) produced by the scattered light on the window, and easily measure the distribution of accurate light intensity of bright light sources interference. By adopting this small light-absorbing screen, it allowed the direct incidence of high-power density lasers.

The components of the device are as follow:

① Body
② USB cable
③ AC adapter (6V)
④ USB memory (Software)

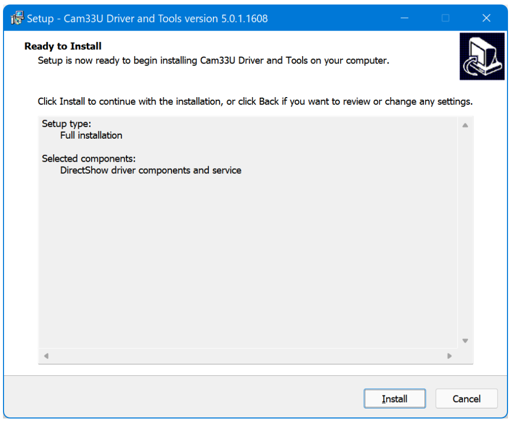
4. Installation

To use the product, you need to install the following parts. Please, proceed in the indicated order.

1. CCD camera device driver
2. LaseView Beam profiler
3. LaseView-LHB driver

4.1. CCD camera device driver installation

I. Double-click on the installer EXE file in the "2. Camera Device Driver" folder. Driver Installation Wizard will open. Click on "Install".


Setup - Cam33U Driver and Tools version 5.0.1.1608

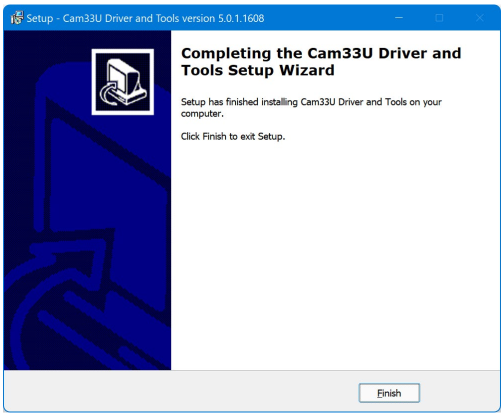
Ready to Install
Setup is now ready to begin installing Cam33U Driver and Tools on your computer.

Click Install to continue with the installation, or click Back if you want to review or change any settings.

Setup type:
Full installation

Selected components:
DirectShow driver components and service

II. When the next screen appears, it is complete.


Setup - Cam33U Driver and Tools version 5.0.1.1608

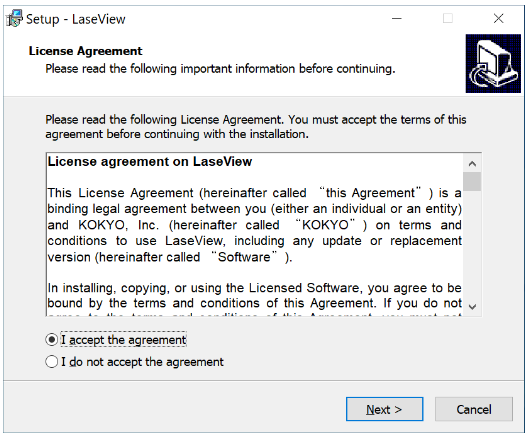
Completing the Cam33U Driver and Tools Setup Wizard

Setup has finished installing Cam33U Driver and Tools on your computer.

Click Finish to exit Setup.

4.2. Installation of LaseView

I. Double-click on the "LaseViewSetupXXXX.exe" file in the "3. LaseView Installer" folder. "License Agreement" window will open. Click on "Next".



License Agreement

Please read the following important information before continuing.

Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.

License agreement on LaseView

This License Agreement (hereinafter called “this Agreement”) is a binding legal agreement between you (either an individual or an entity) and KOKYO, Inc. (hereinafter called “KOKYO”) on terms and conditions to use LaseView, including any update or replacement version (hereinafter called “Software”).

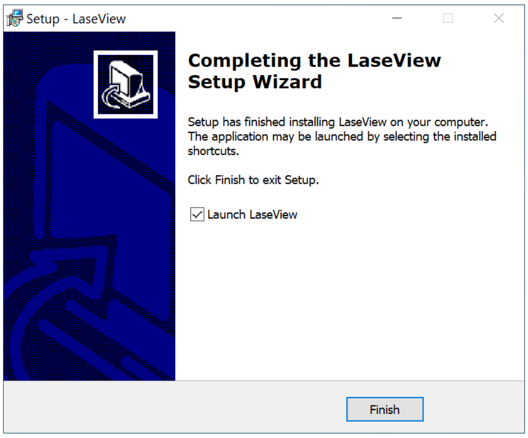
In installing, copying, or using the Licensed Software, you agree to be bound by the terms and conditions of this Agreement. If you do not

● I accept the agreement

○ I do not accept the agreement

A window indicating "Application installation - Security warning" will open. Click "Install (I)", and the Install Window of LaseView will open.

II. Follow the wizard and click "Next" and "Install". Click "Finish" when "Compliting the LaseView Setup Wizard" appears.



Completing the LaseView Setup Wizard

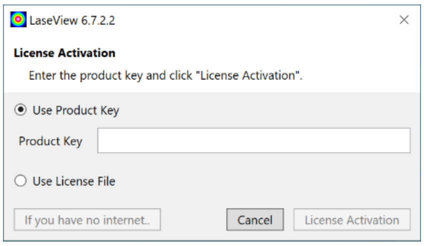
Setup has finished installing LaseView on your computer. The application may be launched by selecting the installed shortcuts.

Click Finish to exit Setup.

☑ Launch LaseView

III. [For license files]

The "License Activation" window will open. Enter your product key and click "License Activation". When the message "The license activation was successful." appears, the process is complete.



LaseView 6.7.2.2

License Activation

Enter the product key and click "License Activation".

● Use Product Key

Product Key

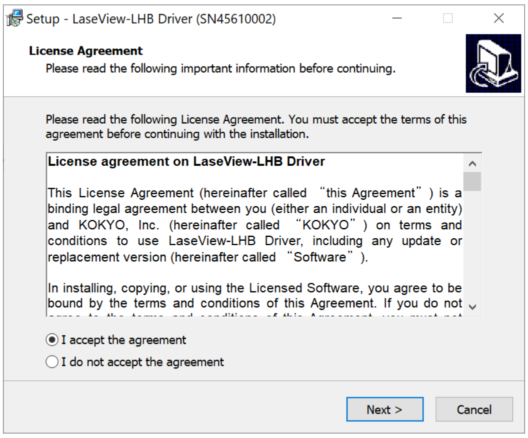
○ Use License File

IV. [For dongle keys]

If a dongle is not connected, the above window will appear and LaseView cannot be started. If the window appears, close the window, connect the dongle, and start LaseView again.

4.3. Installation of LaseView-LHB driver

I. Double-click on the LHBDriverSetupXXXX.exe file in the "4. LaseView-LHB Driver Installer" folder. "License Agreement" window will open. Click on "Next".



Setup - LaseView-LHB Driver (SN45610002)

License Agreement

Please read the following important information before continuing.

Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.

License agreement on LaseView-LHB Driver

This License Agreement (hereinafter called “this Agreement”) is a binding legal agreement between you (either an individual or an entity) and KOKYO, Inc. (hereinafter called “KOKYO”) on terms and conditions to use LaseView-LHB Driver, including any update or replacement version (hereinafter called “Software”).

In installing, copying, or using the Licensed Software, you agree to be bound by the terms and conditions of this Agreement. If you do not

● I accept the agreement

○ I do not accept the agreement

II. Click "Install" on the next window to complete the installation.

5. Operating instructions

Before using LaseView-LHB, note the following limitations. Please use this checklist.

⚠

- Computer performances

If your PC does not meet the requirement, the software may be slow and you may not be able to use the maximal frame rate.

- Beam diameter

If the beam diameter is too small, resolution may be not sufficient. The beam diameter should be 20-times larger or more than the optical resolution for a good measurement accuracy.

- Speckle reduction function

In case you apply the Speckle Reduction function, it requires the process of an average of 10-20 pictures, so that a measurement will take 1-2 seconds (typical value).

- Connection of multiple USB devices

In case you connect several USB devices, depending on the PC performances, there may be a lack of power, and malfunctions of the PC or the USB devices may occur.

- USB 3.0 Extension cable

If you connect the camera with an USB 3.0 Extension cable, etc, the USB 3.0 bandwidth may decrease, speed of transmission too and the frame rate may be degraded, the camera may not be recognized.

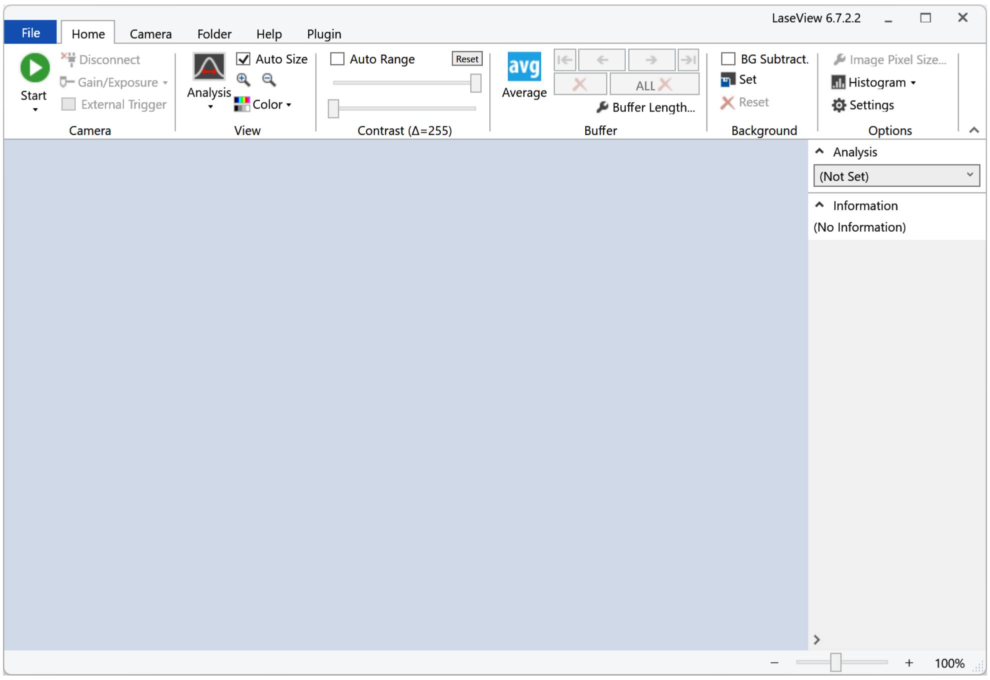
※ Depending on the version, the Guide illustrations may slightly differ from the actual screens but it can be used without any problem.

5.1. Using the general functions of LaseView

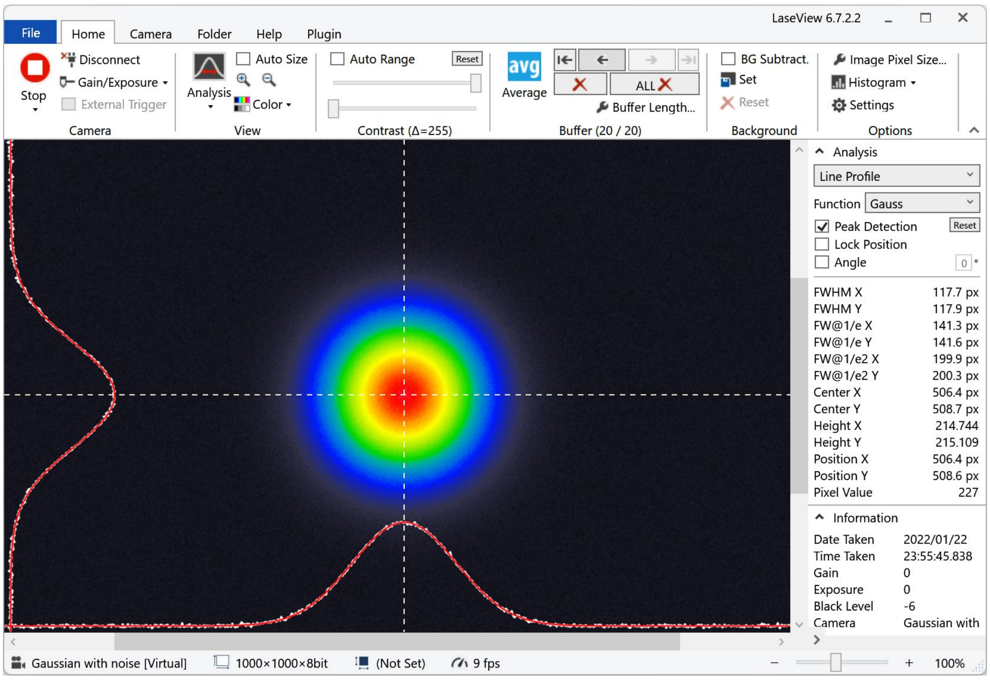
I. Connect your camera (or the LaseView-LHB device) to your PC with the USB cable. Double click the LaseView icon on your PC.

II. If needed, connect the AC adapter. (There is a toggle switch on the DC connector's up face which allows to run the Speckle Reduction function.)

III. Click on the up-left located pull-down menu "Open ▼" of the Home tab window. Select the camera connected to the PC, for instance the "LaseView-LHB (******) [Kokyo]" (where ****** is the serial number).


LaseView 6.7.2.2
File
Home
Camera
Folder
Help
Plugin
Start
Disconnect
Gain/Exposure
External Trigger
Camera
Analysis
☑ Auto Size
Color
View
☐ Auto Range
Reset
Contrast (Δ=255)
avg
Average
ALL
Buffer Length...
Buffer
☐ BG Subtract.
Set
Reset
Background
Image Pixel Size...
Histogram
Settings
Options
Analysis
(Not Set)
Information
(No Information)
100%

IV. Click the "Start" button to start acquisition, and the "Stop" button to stop it. If needed, the "Gain" and "Acquisition time" values can be adjusted to prevent saturation.


LaseView 6.7.2.2
File
Home
Camera
Folder
Help
Plugin
Stop
Disconnect
Gain/Exposure
External Trigger
Camera
Analysis
Auto Size
Color
View
Auto Range
Reset
Contrast (Δ=255)
avg
Average
ALL
Buffer Length...
Buffer (20 / 20)
BG Subtract.
Set
Reset
Background
Image Pixel Size...
Histogram
Settings
Options
Gaussian with noise [Virtual]
1000×1000×8bit
(Not Set)
9 fps
100%

Analysis

Line Profile

Function: Gauss

☑ Peak Detection

☐ Lock Position

☐ Angle 0 °

FWHM X	117.7 px
FWHM Y	117.9 px
FW@1/e X	141.3 px
FW@1/e Y	141.6 px
FW@1/e2 X	199.9 px
FW@1/e2 Y	200.3 px
Center X	506.4 px
Center Y	508.7 px
Height X	214.744
Height Y	215.109
Position X	506.4 px
Position Y	508.6 px
Pixel Value	227

Information

Date Taken	2022/01/22
Time Taken	23:55:45.838
Gain	0
Exposure	0
Black Level	-6
Camera	Gaussian with

V. To save the data, click on the Floppy disk icon in the "File" tab.

- To save the single displayed picture, choose "Save the picture"
- To save all the buffered pictures (max 20), choose "Save all the pictures in the buffer"
- To save the image as displayed, including added graphs,choose "Save the screenshot"
- To save the numerical data of the graphs, choose "Save the graphs numerical data"

Data saved through "Save the picture" can be viewed again in LaseView by Drag&Drop method.

Data saved through "Save the graphs numerical data" is a file which displays, starting from the left, the Horizontal graph's X coordinate (in pixels and meters) and Y coordinate, then the Vertical graph's X coordinate (in pixels and meters) and Y coordinate.

VI. For LaseView-LHB, in case of speckle, turn on the toggle switch of the body to enable the image averaging of LaseView 6. In that case, the suitable buffer size shall be at least 10-20 pictures. When the display is completely stabilized, you can save the pictures.

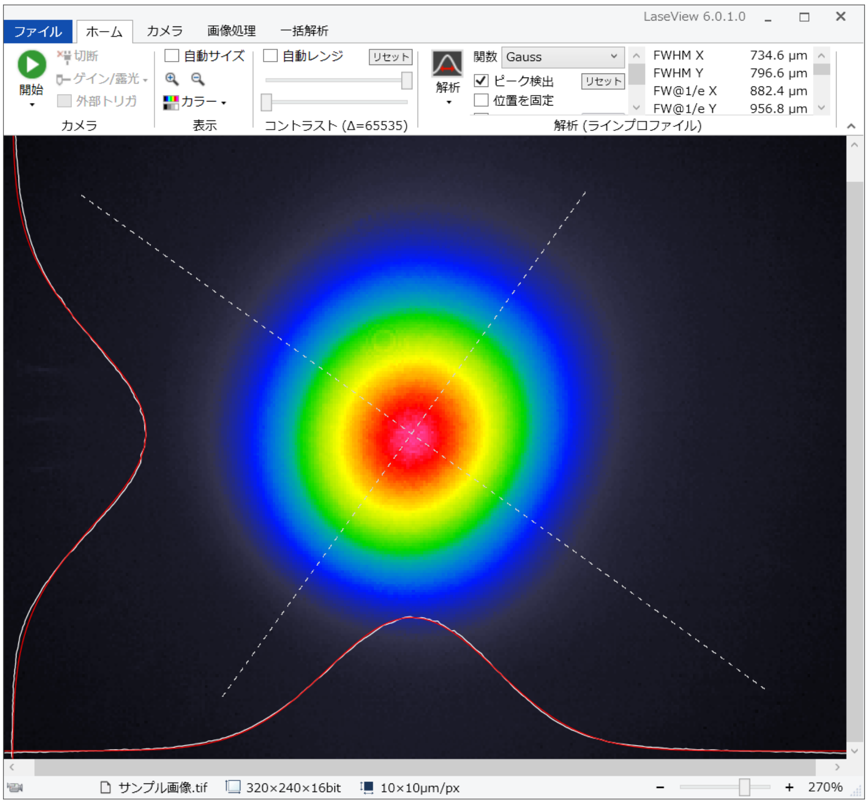
5.2. Using the Analysis functions of LaseView

In the "Home" tab, by clicking the "Analysis" button, you can access to 5 analysis functions: Line profile, Integration profile, Maximum Intensity Projection, Point-to-Point distance, Peak Integration.
The following table displays the names of the variables used in these functions.

Function	**Variable name**	**Description**
Line profile Integration profile Maximum Value projection	FWHM X	Full width at half maximum on the horizontal axis
	FWHM Y	Full width at half maximum on the vertical axis
	FW@1/e X	Full width at max/e on the horizontal axis
	FW@1/e Y	Full width at max/e on the vertical axis
	FW@1/e2 X	Full width at max/(e*e) on the horizontal axis
	FW@1/e2 Y	Full width at max/(e*e) on the vertical axis
	Center X	Centroid position on the horizontal axis
	Center Y	Centroid position on the vertical axis
	Height X	Peak height on the horizontal axis
	Height Y	Peak height on the vertical axis
	Position X	Cursor position on the horizontal axis
	Position Y	Cursor position on the vertical axis
Integration profile	Max X	Signal intensity Maximum value on the horizontal axis
	Min X	Signal intensity Minimum value on the horizontal axis
	Max Y	Signal intensity Maximum value on the vertical axis
	Min Y	Signal intensity Minimum value on the vertical axis
Point-to-Point distance	Distance	Distance between 2 selected points (metric unit)
	Distance	Distance between 2 selected points (pixel unit)
	Pos. X1	X coordinate of the 1st point
	Pos. Y1	Y coordinate of the 1st point
	Pos. X2	X coordinate of the 2nd point
	Pos. Y2	Y coordinate of the 2nd point
Peak Integration	Intensity /cm^2	Intensity at the cursor position (cm^-2 unit)
	Raw value	Digital count value of intensity
	Background	Signal intensity of the background
	Integral	Integral with background substraction
	Raw Integral	Integral without background substraction
	Position X	Cursor position on the horizontal axis
	Position Y	Cursor position on the vertical axis

5.2.1. Line Profile

Displays line profile (white lines) along the white dashed cross-line. You can calculate FWHM of the beam profile, and also fit the profile with Gauss, Lorentz, and Sech^2 functions (The red line is the fitting result by Sech^2 function). The white dashed cross-line can be rotated.


LaseView 6.0.1.0
ファイル
ホーム
カメラ
画像処理
一括解析
切断
開始
ゲイン/露光
外部トリガ
カメラ
表示
カラー
リセット
コントラスト (Δ=65535)
解析
解析 (ラインプロファイル)

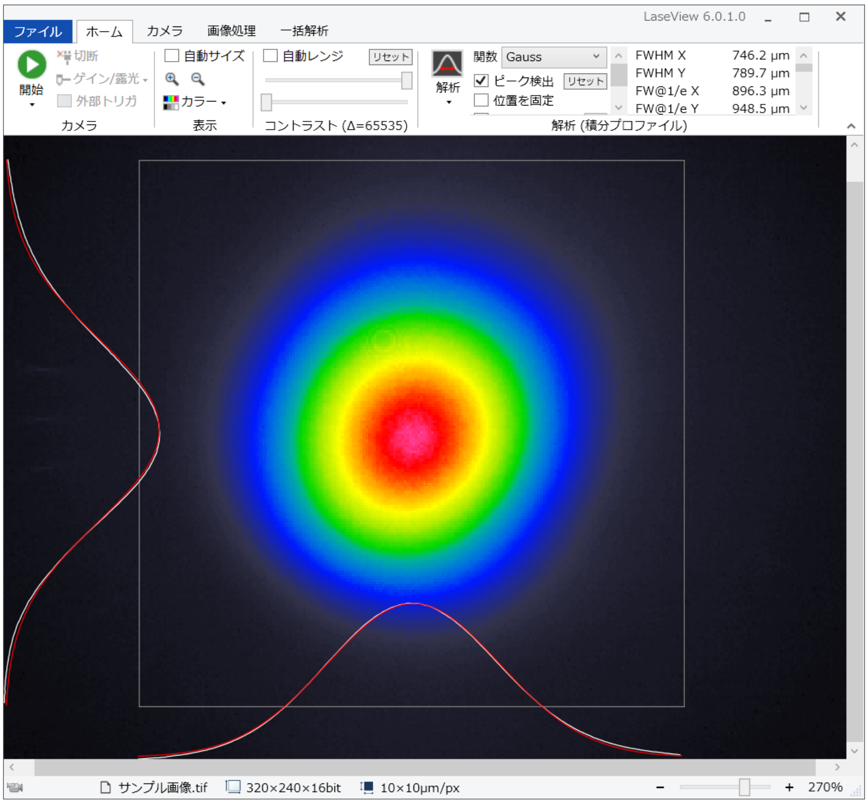
☐ 自動サイズ
☐ 自動レンジ
関数 Gauss
☑ ピーク検出
☐ 位置を固定

FWHM X	734.6 µm
FWHM Y	796.6 µm
FW@1/e X	882.4 µm
FW@1/e Y	956.8 µm

サンプル画像.tif
320×240×16bit
10×10µm/px
270%

5.2.2. Integration Profile

Displays averaged profile in the horizontal and vertical direction (with analysis function similar to Line Profile).


LaseView 6.0.1.0
ファイル
ホーム
カメラ
画像処理
一括解析
開始
切断
ゲイン/露光
外部トリガ
カメラ
自動サイズ
カラー
表示
自動レンジ
リセット
コントラスト (Δ=65535)
解析
リセット
解析 (積分プロファイル)

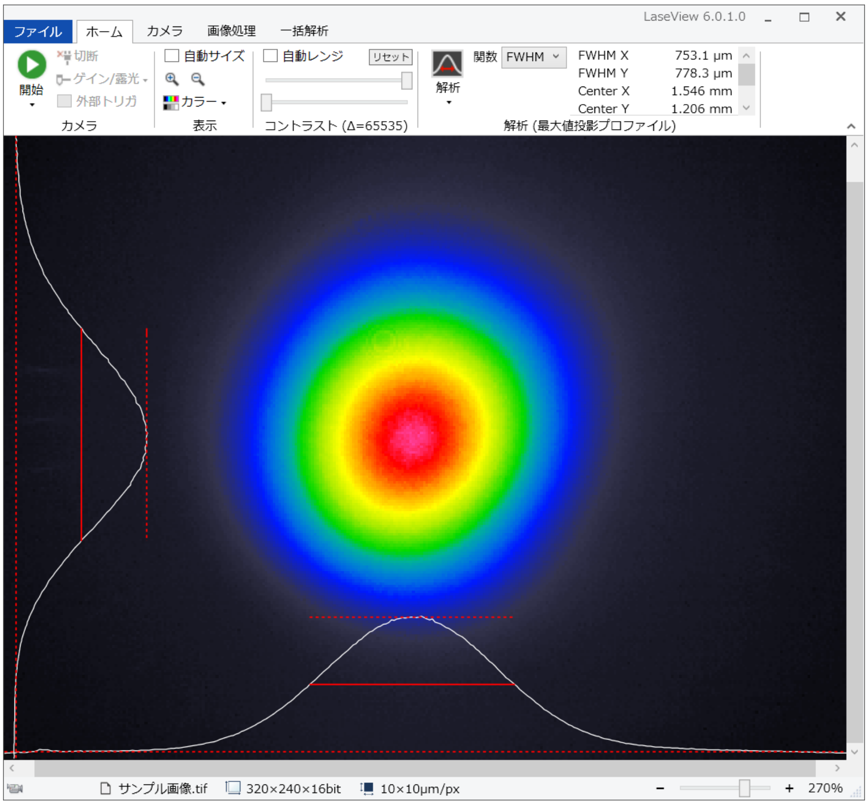
関数 Gauss
☑ ピーク検出
☐ 位置を固定

FWHM X 746.2 µm
FWHM Y 789.7 µm
FW@1/e X 896.3 µm
FW@1/e Y 948.5 µm

サンプル画像.tif
320×240×16bit
10×10µm/px
270%

5.2.3. Maximum Intensity Projection

Displays the orthogonal projection (maximum value) profile of the horizontal and vertical direction (with analysis function similar line profile). FWHM is measured in the picture below.


LaseView 6.0.1.0
ファイル
ホーム
カメラ
画像処理
一括解析
開始
切断
ゲイン/露光
外部トリガ
カメラ
自動サイズ
カラー
表示
自動レンジ
リセット
コントラスト (Δ=65535)
解析
解析 (最大値投影プロファイル)

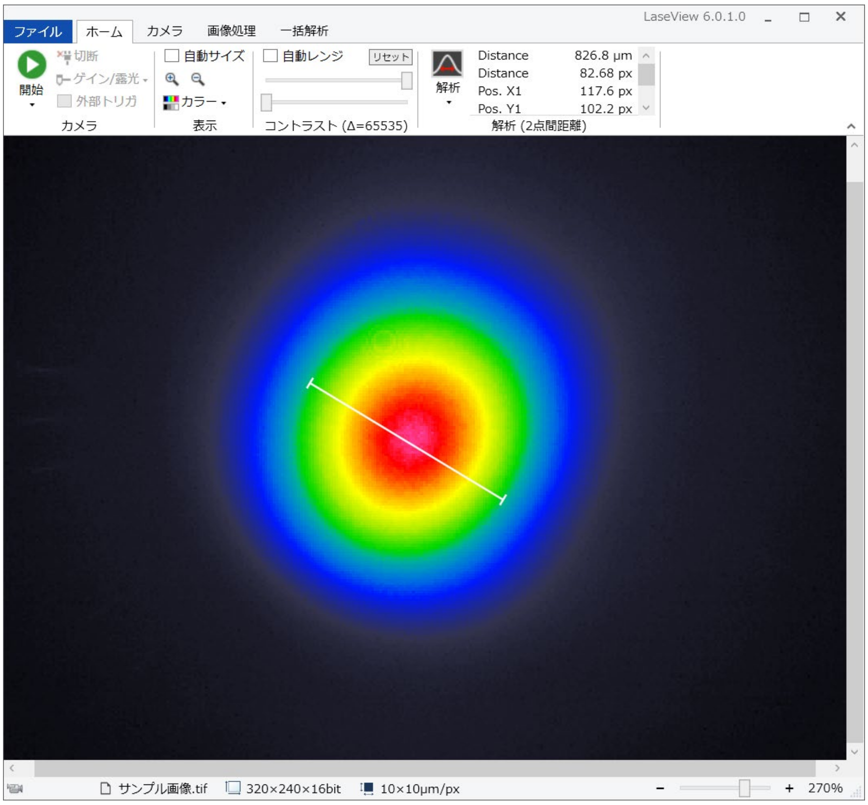
関数 FWHM

FWHM X	753.1 µm
FWHM Y	778.3 µm
Center X	1.546 mm
Center Y	1.206 mm

サンプル画像.tif 320×240×16bit 10×10µm/px 270%

5.2.4. Point-to-Point Distance

Measurement of the distance between any pair of points on the screen. As shown in the following picture, you can measure for instance the diameter at any intensity level ; here the green circle diameter is 826.8 µm.



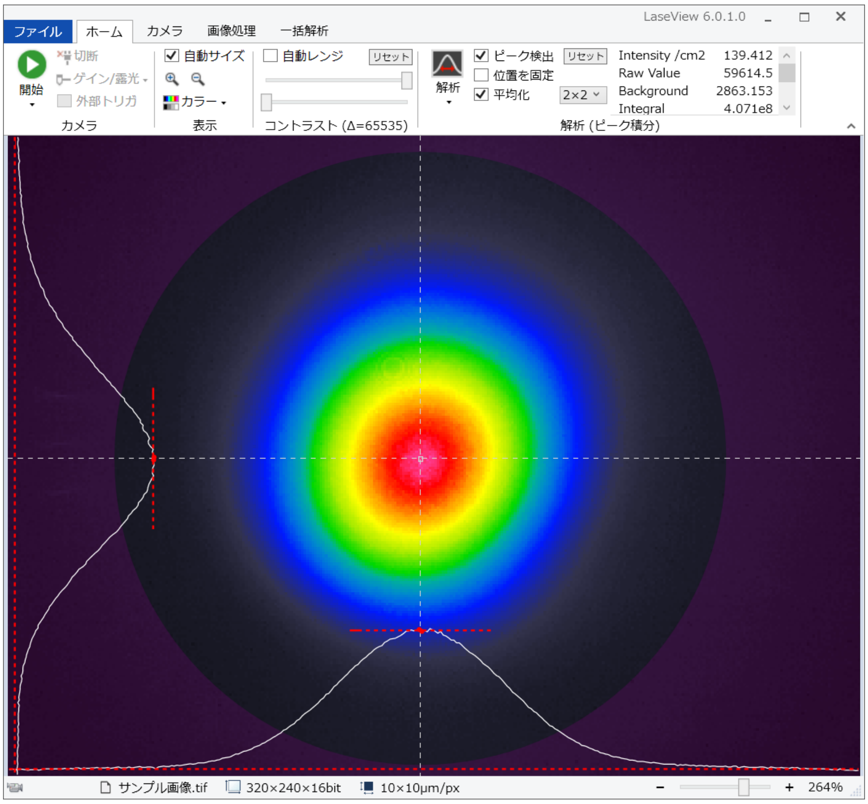
Distance 826.8 µm
Distance 82.68 px
Pos. X1 117.6 px
Pos. Y1 102.2 px

サンプル画像.tif
320×240×16bit
10×10µm/px
270%

LaseView 6.0.1.0
ファイル
ホーム
カメラ
画像処理
一括解析
開始
切断
ゲイン/露光
☐ 外部トリガ
カメラ
☐ 自動サイズ
カラー
表示
☐ 自動レンジ
リセット
コントラスト (Δ=65535)
解析
解析 (2点間距離)

5.2.4. Peak Integration

This function calculate the integrated value inside a circle, while setting the outside of this circle as the background. You may adjust the circle's size and position in order to fit your beam. If you select Peak Detection as shown below, the position of the peak inside the circle will be indicated by a white dashed cross-line.


LaseView 6.0.1.0
ファイル
ホーム
カメラ
画像処理
一括解析
開始
切断
ゲイン/露光
☐ 外部トリガ
カメラ
表示
カラー
コントラスト (Δ=65535)
リセット
解析
解析 (ピーク積分)
サンプル画像.tif
320×240×16bit
10×10μm/px
264%

☑ 自動サイズ
☐ 自動レンジ
☑ ピーク検出
☐ 位置を固定
☑ 平均化 2×2

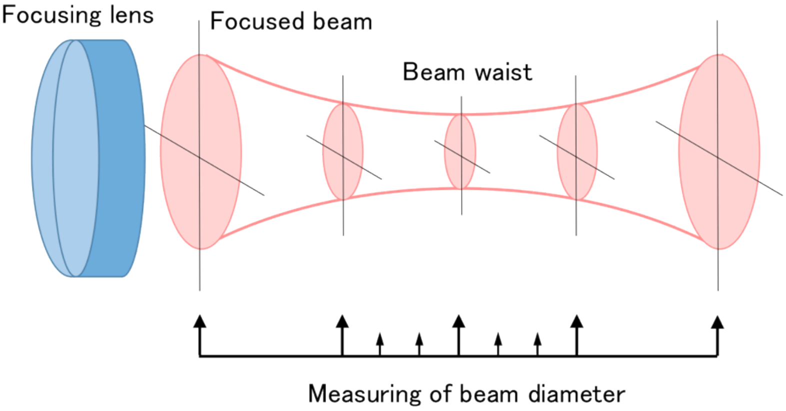
Intensity /cm2	139.412
Raw Value	59614.5
Background	2863.153
Integral	4.071e8

5.3. How to operate various LaseView global analysis function

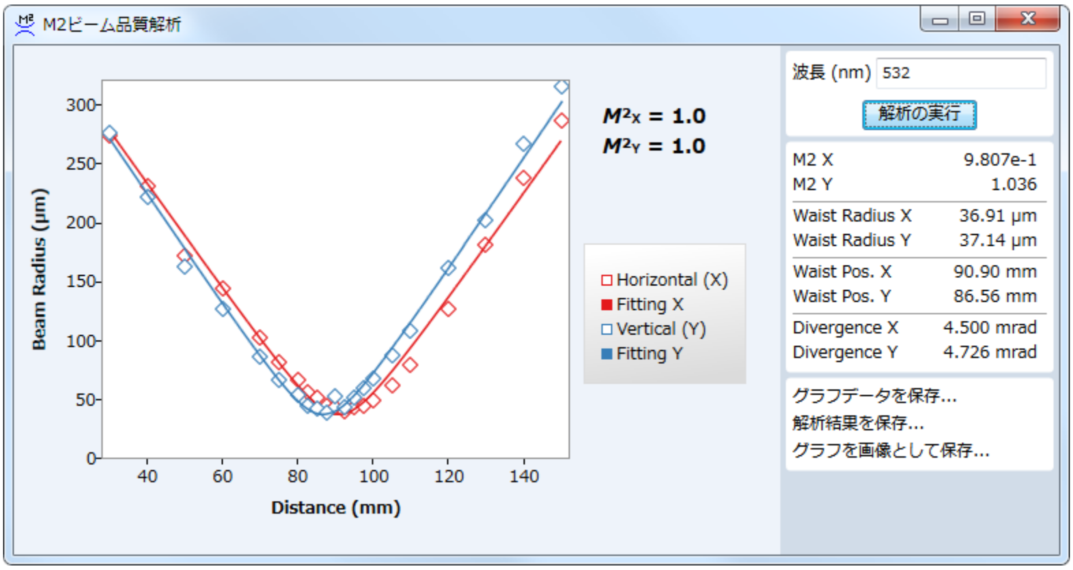
In the "Global analysis" tab, you can access this 4 analysis functions: M^2 beam quality, Divergence angle, Image logging, Beam pointing.

5.3.1. Using M^2 beam quality measurement

1. Setting up an optical system
   (a) Focus the laser beam by a lens with a F-number of about 50 to 100.
   (b) Set the optical rail or ruler to enable the CCD camera to slide ±50mm～±150mm around the beam waist.
   (c) If needed, attenuate the incident beam, adjust the Gain and Exposure time.
2. Start LaseView and create (or select) a folder to save pictures by clicking “Open Folder…” in the option in the “File” tab.
3. Slide the CCD camera on the optical axis and save 10 to 30 beam profiles around the ±50mm～±150mm area of the beam waist as described below.
   (a) Check the diameter of the beam waist.
   (b) Move the CCD camera to a position where the beam diameter is about 5 times larger than the diameter of the beam waist.
   (c) When the camera is fixed, adjust the beam amplitude and exposure time to obtain low noise pictures.
   (d) Click the "save the image" of the "File" tab, fill the position value of the CCD camera in the file name box. You can set the unit to nm, μm (um), mm, cm, or m. If the unit is not set, mm is automatically used for calculation.
   ex) 30mm.tif, 100mm.tif, 150mm.tif
   (e) Repeat the (c) and (d) while moving the CCD camera at 2～10 mm intervals. The interval does not need to be regular, however measuring with short intervals is recommended, especially around the beam waist for higher accuracy.


Focusing lens
Focused beam
Beam waist
Measuring of beam diameter

4. Click “M^2 Beam Quality Analysis” in the "collective analysis" tab to display M^2 Beam Quality Analysis window. Fill the wavelength (nm) of the laser in the upper right text box.
5. Click the “Execute Analysis” button and the result is shown in the graph.
   *The result shows the beam radius.


M2ビーム品質解析
Beam Radius (μm)
300
250
200
150
100
50
0
40
60
80
100
120
140
Distance (mm)
M²x = 1.0
M²y = 1.0
□ Horizontal (X)
■ Fitting X
□ Vertical (Y)
■ Fitting Y
解析の実行
グラフデータを保存...
解析結果を保存...
グラフを画像として保存...

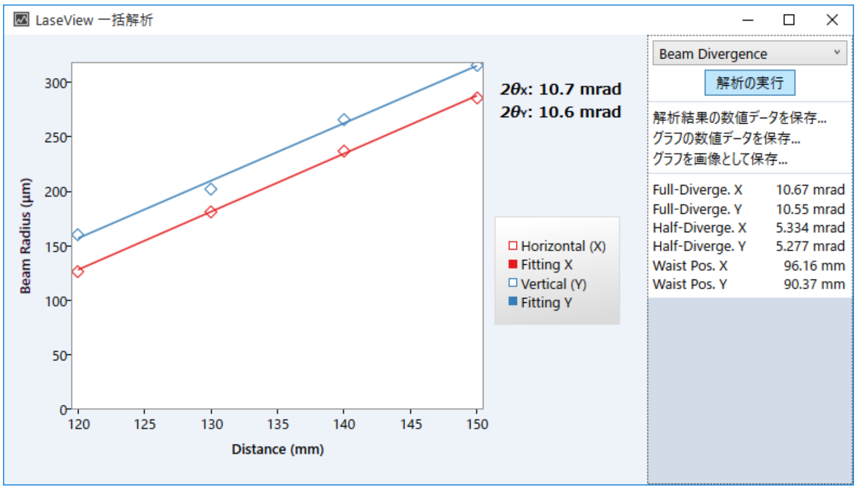
波長 (nm) 532

M2 X	9.807e-1
M2 Y	1.036
Waist Radius X	36.91 μm
Waist Radius Y	37.14 μm
Waist Pos. X	90.90 mm
Waist Pos. Y	86.56 mm
Divergence X	4.500 mrad
Divergence Y	4.726 mrad

5.3.2. The beam divergence angle analysis function

The beam divergence angle analysis procedure is described below:

1. Click on “Open Folder” of the “File” tab, and create an empty folder (or indicate an existing one) in order to save the images.
2. Measurements taken at 2 or more positions shall be saved in the same folder. Indicate the position in the file name (example: 1.5m, 25cm…).
3. Click the “Divergence angle” button of “Collective analysis” tab . The Divergence angle window opens.
4. When you click the “Execute analysis”, the result will be displayed in a graph.


LaseView 一括解析
Beam Divergence
解析の実行
解析結果の数値データを保存...
グラフの数値データを保存...
グラフを画像として保存...
2θx: 10.7 mrad
2θy: 10.6 mrad
Beam Radius (μm)
300
250
200
150
100
50
0
120
125
130
135
140
145
150
Distance (mm)
☐ Horizontal (X)
🟥 Fitting X
☐ Vertical (Y)
🟦 Fitting Y

```
Full-Diverge. X    10.67 mrad
Full-Diverge. Y    10.55 mrad
Half-Diverge. X    5.334 mrad
Half-Diverge. Y    5.277 mrad
Waist Pos. X        96.16 mm
Waist Pos. Y        90.37 mm
```

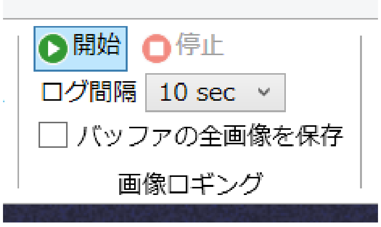
Example of analysis result

5.3.3. Image logging function

The Image logging procedure is described below:

1. Click on "Open folder" in the "File" tab, and create an empty folder (or indicate an existing one) in order to save the images.
2. Indicate the "Log Interval" in the "Image logging" frame of the "Global Analysis" tab. The saving time interval can be set between 1s and 1h.
3. Click on "Start" in the "Home" tab.
4. When you click on "Start" inside the "Image logging" frame of the "Global Analysis" tab, the images are recorded according to the specified time interval. Note that if the specified time interval is short, a lot of pictures will be saved.

When you select the "Save all the pictures of the buffer" checkbox ☑, the unsaved pictures in the buffer are saved at once (several pictures are saved inside a single file). For instance, if the size of the buffer is 20, a maximum of 20 pictures are saved inside one file.

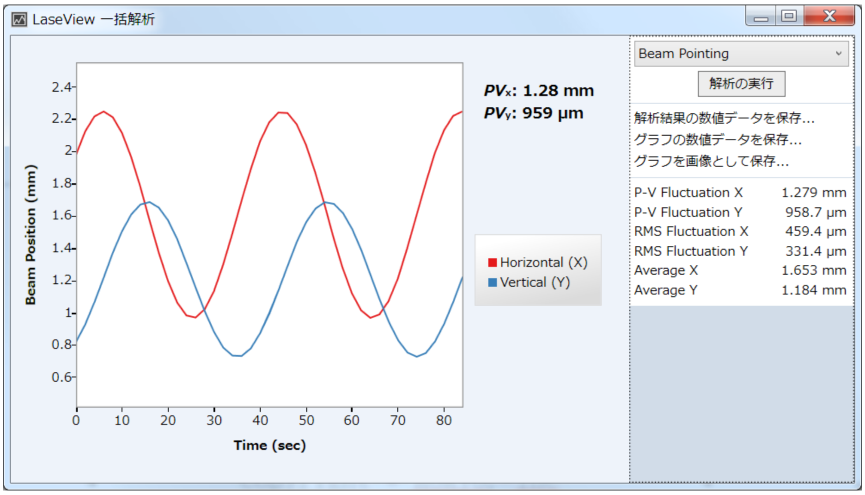


ログ間隔 10 sec

5.3.4. Beam pointing variation Analysis function

Beam pointing measurement procedure is described below.

1. Click on “Open Folder” of the “File” tab, and create an empty folder (or indicate an existing one) in order to save the images.
2. Use the image logging function, and save images taken at an appropriate time interval.
3. Click the “Pointing” button.
4. When you click the “Execute analysis”, the changes over time of X and Y coordinates of the beam barycenter will be displayed in a graph. The elapsed time time is calculated based on the shooting date and time embedded in the file.


LaseView 一括解析
Beam Position (mm)
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0
10
20
30
40
50
60
70
80
Time (sec)
🟥 Horizontal (X)
🟦 Vertical (Y)
Beam Pointing
解析の実行
解析結果の数値データを保存…
グラフの数値データを保存…
グラフを画像として保存…

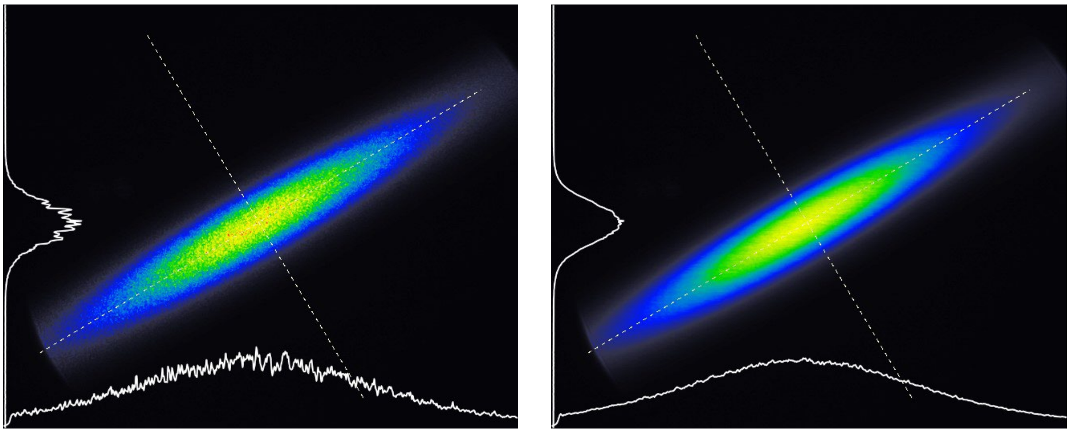
PV_X: 1.28 mm
PV_Y: 959 µm

P-V Fluctuation X	1.279 mm
P-V Fluctuation Y	958.7 µm
RMS Fluctuation X	459.4 µm
RMS Fluctuation Y	331.4 µm
Average X	1.653 mm
Average Y	1.184 mm

5.4. Speckle reduction in LaseView-LHB

5.4.1. About speckle reduction

When measuring narrow line width laser beam, speckle noise may occur in the beam profile. Speckle noise can be reduced by rocking the screen and performing software averaging. (In the case of a light source with low coherence such as LED, speckle noise does not occur, so it is not necessary to use this function.)



Without speckle reduction With speckle reduction

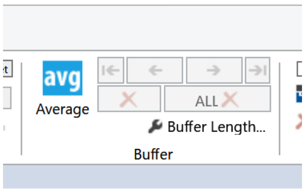
The figures are a comparison when the speckle reduction is turned OFF / ON when measuring single-transverse-mode semiconductor laser. When it is ON (right figure), you can see that fine noise is reduced. The noise generated when OFF (left figure) is not the actual intensity distribution, but the noise caused by the speckle caused by the interference effect of the screen.

5.4.2. How to use the speckle reduction function

I. Connect the AC adapter (DC6V) to the LaseView-LHB and turn on the toggle switch.

II. It is normal if you can hear the motor sound and the screen swings from side to side.

III. Click [Average] on the [Home] tab to enable the averaging mode. Set the [Buffer Length] to 20 or more.



IV. If the speckle reduction is insufficient, increase the buffer length. The average time of 1 second or longer is appropriate. (For example, if the frame rate of the camera is 30 fps, the buffer length should be more than 30)

V. If there is no change in the image even if the screen swing is turned ON / OFF, the speckle has not occurred. Please turned off the screen swing and the averaging.

6. LaseView-LHB Specifications

LaseView-LHB-25

LaseView-LHB

Item	Specifications	
Model	LaseView-LHB-25	LaseView-LHB
Active area	25 mm × 25 mm	50 mm × 50 mm
Power density	0.1～100 W/cm^2 (Sensitivity is adjusted by exposure time)	
Maximum power	10 W at maximum	
Incident angle	±15°	
Optical resolution	~50 μm	~100 μm
Wavelength range	400－1100nm (focused for a specific wavelength)	
Number of sensor pixels	1440×1080	
Number of image pixels	1600×1600	
Dynamic range	8 / 16 bit	
Frame rate	238 fps at maximum	
Exposure time	1 μs～30 s	
Interface	USB 3.0	
Supply voltage	For camera: 5 V (from USB) For motor: 6 V (from AC adapter)	
Dimensions (mm)	W129×H57.5×D116	W154×H83×D130
Remarks	● The beam diameter should be 20-times larger or more than the optical resolution for a good measurement accuracy. ● The frame rate may be further limited on the PC performances and the USB connection. ● If you use the Speckle Reduction function, a mean of 10－20 pictures must be processed so that the measurement time may grow up to 1－2s (typical values).	

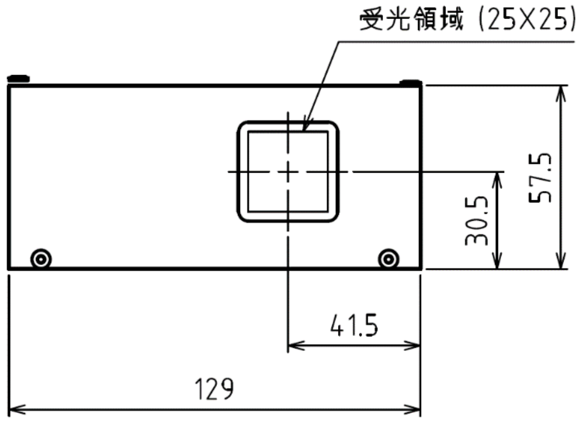
LaseView-LHB-100

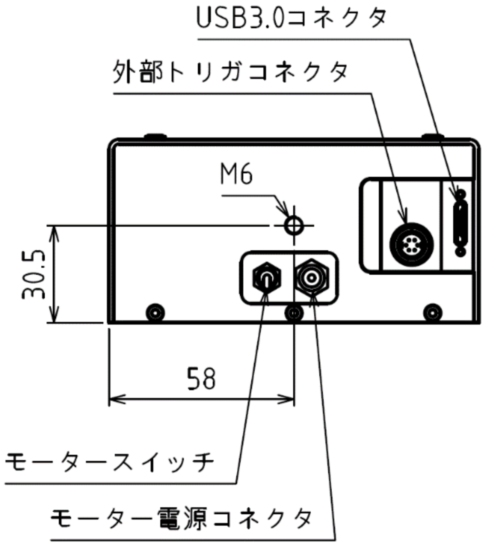
LaseView-LHB-200

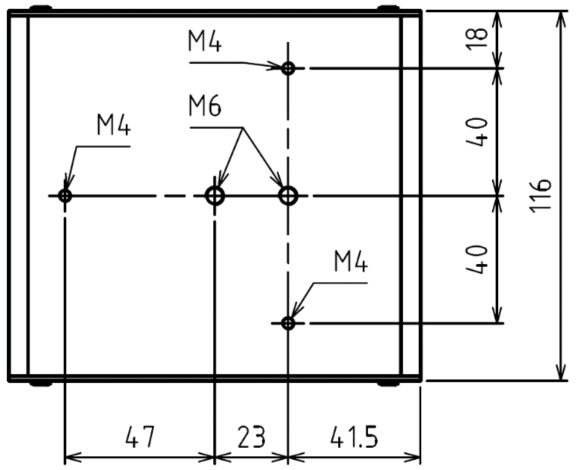
Item	Specifications	
Model	LaseView-LHB-100	LaseView-LHB-200
Active area	100 mm × 100 mm	200 mm × 200 mm
Power density	0.1～100 W/cm^2 (Sensitivity is adjusted by exposure time)	
Maximum power	10 W at maximum	
Incident angle	±15°	
Optical resolution	~200 μm	~400 μm
Wavelength range	400ー1100nm (focused for a specific wavelength)	
Number of sensor pixels	2048×1536	2448×2048
Number of image pixels	1600×1600	2500×2500
Dynamic range	8 / 16 bit	
Frame rate	60 fps at maximum	38 fps at maximum
Exposure time	1 μs～30 s	
Interface	USB 3.0	
Supply voltage	For camera: 5 V (from USB) For motor: 6 V (from AC adapter)	
Dimensions (mm)	W208×H137×D173	W389×H258×D268
Remarks	● The beam diameter should be 20-times larger or more than the optical resolution for a good measurement accuracy. ● The frame rate may be further limited on the PC performances and the USB connection. ● If you use the Speckle Reduction function, a mean of 10ー20 pictures must be processed so that the measurement time may grow up to 1ー2s (typical values).	

7. External drawing

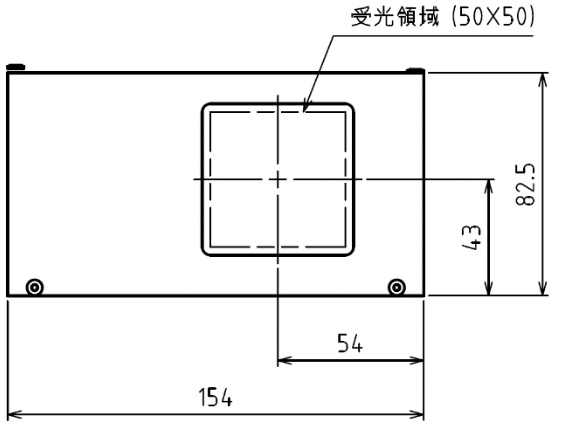
LaseView-LHB-25

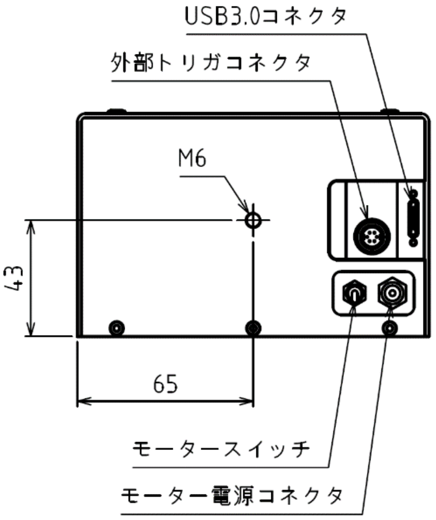

受光領域 (25X25)
57.5
30.5
41.5
129

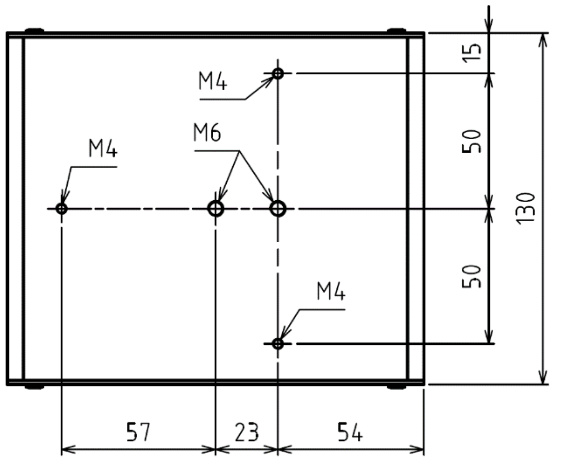

USB3.0コネクタ
外部トリガコネクタ
M6
30.5
58
モータースイッチ
モーター電源コネクタ


M4
M6
M4
M4
18
40
40
116
47
23
41.5

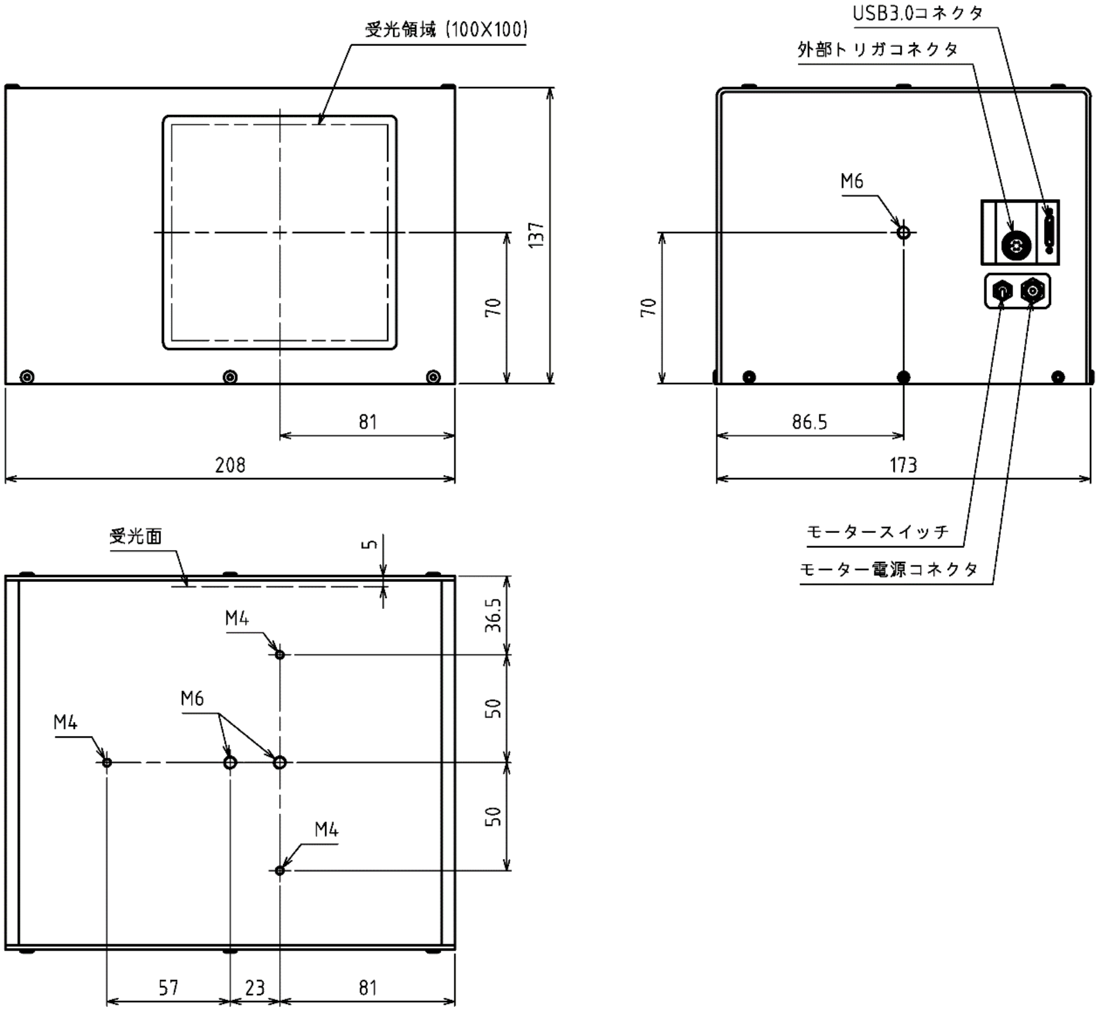
LaseView-LHB


受光領域 (50X50)
82.5
43
54
154

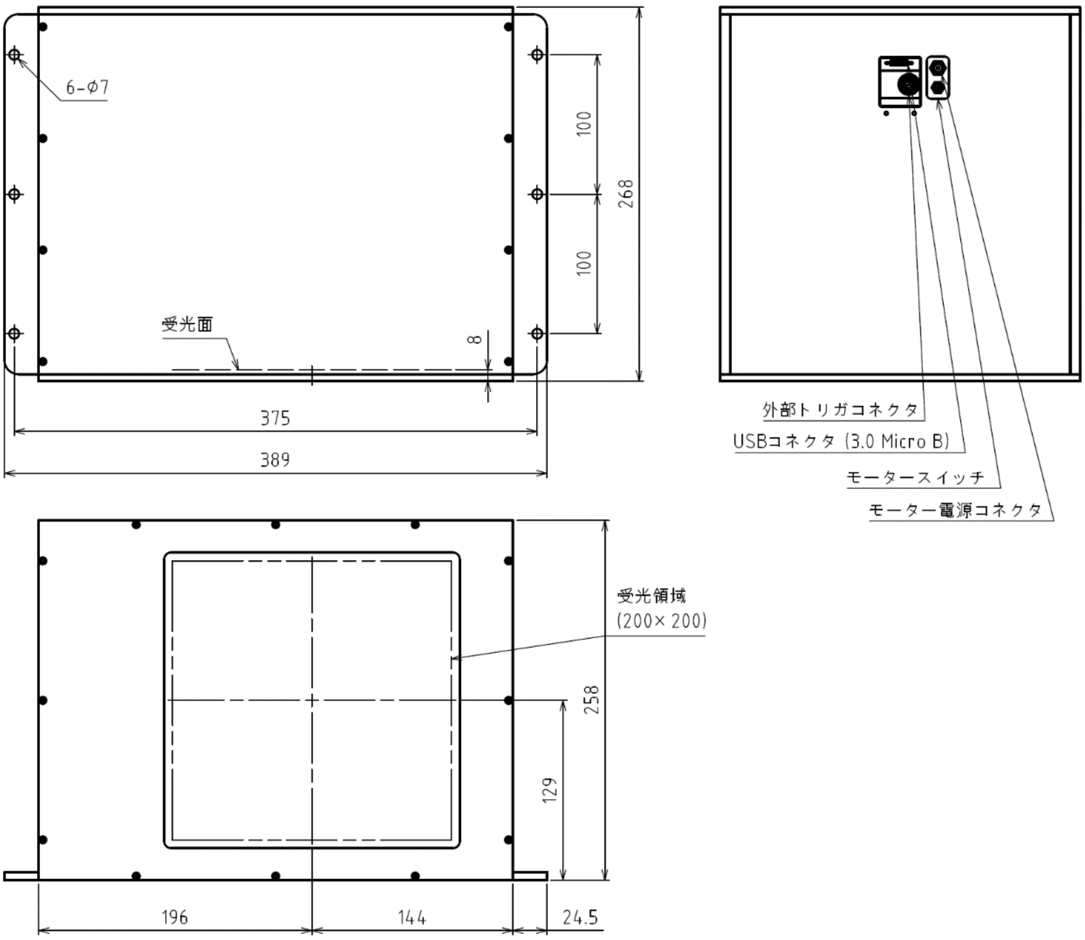

USB3.0コネクタ
外部トリガコネクタ
M6
43
65
モータースイッチ
モーター電源コネクタ


15
M4
50
M6
M4
130
50
M4
57
23
54

LaseView-LHB-100


受光領域 (100X100)
137
70
81
208
USB3.0コネクタ
外部トリガコネクタ
M6
70
86.5
173
モータースイッチ
モーター電源コネクタ
受光面
5
36.5
M4
M6
M4
50
50
M4
57
23
81

LaseView-LHB-200


6-Φ7
100
100
268
受光面
8
375
389
外部トリガコネクタ
USBコネクタ (3.0 Micro B)
モータースイッチ
モーター電源コネクタ
受光領域
(200× 200)
258
129
196
144
24.5

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