Chemi-luminescence Imaging System

CheBI

Chemi-luminescence Bioimaging Instrument

User Manual

Ver. 3.0

Chemi-luminescence Imaging System, CheBI User Manual Ver. 3.0

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Overview

CheBI is optimized for Western blot research, using the highly efficient Cooling CCD Camera.
Its compact size (260 x 260 x 400mm) helps make better use of a space in the laboratory.
It's exposure time can be set by the users manually or it can be calculated automatically. Also, the shots can be accumulated which enable users to choose the best shot.
Users can select a certain Region Of Interest (ROI), measure the ROI and manage the data using Microsoft Excel.

Features of CheBI

1. High quality Chemi-luminescence images
Using highly efficient Cooling CCD camera, high quality luminescence signal from Western blotted membrane can be captured.

2. Compact size
Western blot, which is used to be conducted in a dark room, is now possible to be conducted on a table maximizing the use of space in laboratories. Especially, CheBI can be used even in very cramped laboratories, as it is designed on a reduced scale which is a complement from the other existing instruments which take huge spaces.

3. Auto-calculation of exposure time and Capture
It figures out the optimized exposure time for each sample and captures. The optimized images of different types of samples can be captured by CheBI as it applies the optimized exposure time for the each sample.

4. Accumulate capture and optimized image acquisition
The function of Accumulation can be used when the sample is not clear enough. It captures continuously to acquire the accumulated images. When the optimized image is obtained, user can stop the accumulation.

5. Quantitative analysis

Protein band can be set in the form of a square, circle, polygon or automatically. Then, the corresponding area, intensity average value and integrated density value can be measured. The values measured in this manner can be saved as CSV file extension in the form of tables.

6. Simple and Easy Tips for Users

Main features of the program are listed on the side panel for a user to use conveniently. Just a few custom-designated values exist and therefore, users can easily use the program.

How to Install and Use

Please install the program in the following manner for use.

1. Connect the DC adaptor to DC jacks at the back of CheBI.

2. Connect the USB cable to the back of CheBI and computer.

3. Turn on the Cam switch at the front, to supply the power to the camera.

4. Turn on the computer and activate the NEOimage Program.

5. Turn on the White switch at the front, to turn on the white light. Then open the doors to adjust the focus of the lens while looking at the monitor.

6. Turn off the White light and acquire the luminescent image.

*** Caution: When the installation is completed, Calibration is needed before use. Calibration is needed only once after installation.**

*** Calibration instructions:**

-Connect the instrument to the computer and turn on the Cam button.

-Open the program and click on the Calibration from Config tab in the Menu Bar.

-5 steps of Calibration will be proceeded and the status can be checked through the Status Bar.

Driver Connection and Program Installation

1. Driver Connection

1) Insert NEOimage USB memory card into the USB port of the computer.

2) Connect CheBI to the computer with the USB cable.

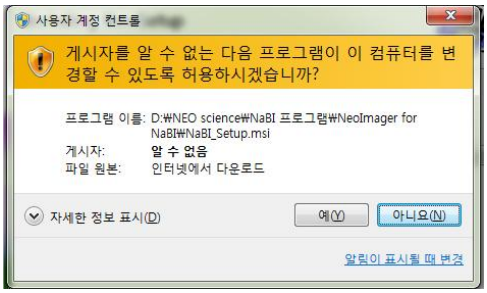
3) Install the driver that is relevant to the computer from the Driver folder in the USB.

2. Program Installation

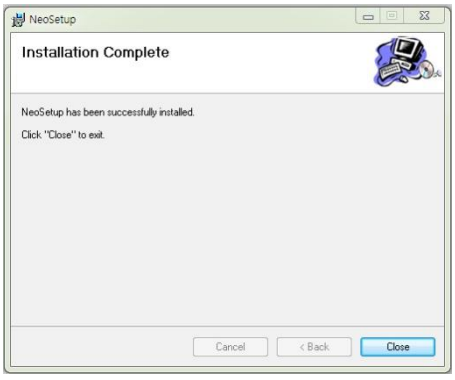
1) Double-click CheBI_Setup.msi in the USB to start installation.

2) Follow the instruction and click “Next” to proceed installation.

3) Click “Yes” on the pop up message allowing the publisher to continue installation.

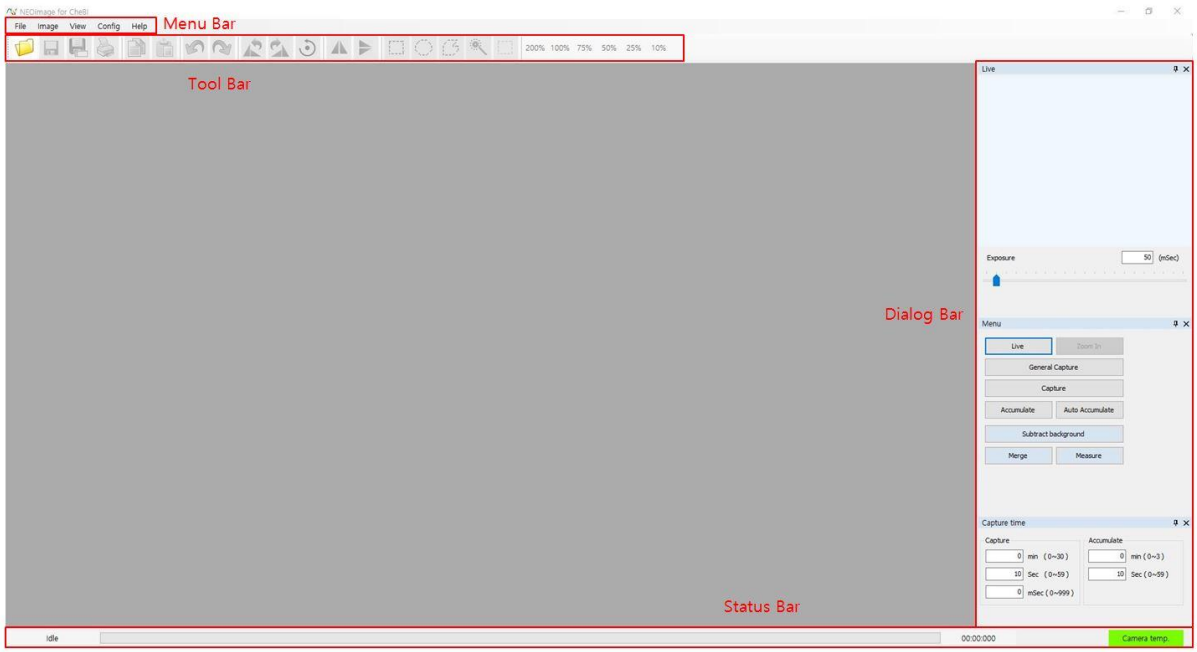


4) When the Installation complete message pops up, installation is completed.



5) Double-clike (x86)₩NeoScience₩CheBI from the Program Files in the C drive or NEOimage CheBI.exe on the desktop to activate the program.

NEOimage



1. Dialog Bar

1) Live: It shows the status within the chamber in real time.

2) Zoom: Click on the Zoom icon to zoom in when adjusting the focus of the lens. Click again to return to the original size.

3) General Capture: It is used for capturing the general image (the image of the Marker) not the Chemi-luminescence signal. Adjust the brightness by using the Exposure function then capture. The image is stored in the "C₩FCheBI data" folder. When a program is shut down without saving a file by accident, the file can be found in this folder. The obtained file is saved in the "YearMonthDay_HourMinuteSecond.bmp" format indicating the time when the picture is taken.

4) Capture: Exposure time can be adjusted manually. Exposure time can be set by putting a certain number in the blanks. The Exposure time can be set by min, sec or milli-sec.

5) Accumulate: By entering a certain number of the exposure time in the blank, it continuously captures to accumulate the images. It counts each images so the user can be aware how many images are taken. It captures up to 30 images. The obtained file is automatically saved in the "YearMonthDay_HourMinuteSecond.bmp" format indicating the time when the picture is taken.

6) Auto Accumulate: For the first 10 seconds, it figures out the appropriate exposure time by measuring the intensity of the signal. The exposure time will be chosen from 4 options of 1 second, 10 seconds, 1 minute or 3 minutes. Once the exposure time is decided, it captures and accumulates the images. As the signal gets more intense, the exposure time is shorter. Likewise the Accumulate, Auto Accumulate captures up to 30 pictures and automatically saves the data.

7) Subtract background: It lowers the intensity of the whole picture by the average intensity of the selected background. When this feature is activated, a message requiring a user to choose the area which constitutes the background in the picture pops up. Press OK, and the background of the picture is removed.

8) Merge: It overlaps the General picture (Marker picture) and the Signal picture. When the Merge button is activated, a message requiring a user to select the General picture and Signal picture opens up. "OK" button is clicked after choosing the corresponding pictures, then the two pictures are merged and a new window is created.

9) Measure: It designates ROI (Region of interest) on the obtained fluorescent image and secures the number of pixels, intensity value and volume value within the ROI. First, designate the area to be measured as the ROI and click "Measure" to create a new window containing the measured value in the table form. In the table, "ROI" indicates the ID number of the designated ROI. "Area" means the number of pixels within the designated ROI. "Mean of Intensity" is the average value of the measured intensity value from each pixel within the ROI. "Integrated Density" is the value of the "Area" value multiplied with the "Mean of Intensity" value. When the sizes of the fluorescent signals within the ROI are compared, "Integrated Density" values shall be compared. The obtained quantitative value can be stored as the CSV extension by clicking "Export". (It can be opened on the Excel program)

2. Menu Bar

1) File: It opens, closes, saves, saves as, opens Rainbow Standard and closes the obtained picture.

2) Image: Functions such as undo all, undo and etc. can be done.

3) View: It selects Standard Tool Bar, Edit Tool Bar, Status Bar, and Dialog Bar visible or hidden.

4) Config: When the installation is completed for the first time, Calibration needs to be done.

5) Help: It checks the information of NEOimage.

3. Tool Bar

1)  Open: Select files to open.

2)  Save: Edited images can be saved.

3)  Save as: Acquired or modified images can be saved with a different name.

4)  Print: Selected images can be printed to the connected printer.

5)  ROI copy: Designated ROI can be copied.

6)  ROI paste: Copied ROI can be pasted.

7)  Undo: Analyzed picture can return to the previous status.

8)  Repeat: Undone picture can be repeated.

9)  Counterclockwise rotation: Rotate the picture to counterclockwise.

10)  Clockwise rotation: Rotate the picture to clockwise.

11)  Rotation by angle: Pictures can be rotated by a custom angle. When the custom angle is a positive number, the picture is rotated to the right and when the custom angle is a negative number, the picture is turned to the left.

12)  Flip horizontally: Reverse the picture right and left.

13)  Flip Vertically: Reverse the picture upside down.

14)  ROI designation: The ROI can be designated by selecting the feature of Square, Circle, Polygon or Auto form. The gray-colored polygon-shaped icon initializes the designated ROI.

15)

Zoom in and out: The size of the selected picture can be adjusted. At first, the picture is shown in the 25% size of the actual sample. By clicking the icons, the picture can be zoomed in and out.

4. Status Bar

It shows the status of the instrument at present. When it is connected to the computer, the bar will show “Idle” and turns to green color at the left corner. When it is not connected, “Disconnected” with red color will be shown at the left corner. At the right corner, it shows the status of the temperature of the camera. When the bar turns to green and indicates “Camera temp.” then it is cooled down and ready to use. When it turns to red and blinks, that means the temperature of the camera is too high to use. When it captures pictures, analyzes the data or calibrates, the status of the each stage is indicated in the green bar at the centre.

Specification

Resolution	6.1 Mega pixel
Camera cooling	Ambient - 40°C
Working temperature	0 ~ 60°C
Size (WxDxH)	260 x 260 x 400mm
Interface connector	Standard USB 2.0
Field of View	220 x 180mm
Exposure type	Manual or Accumulate
Maximum exposure time	30 min
Data backup	Save the backup data at the same time
Measurements	ROI area, intensity and integrated density
ROI setting	Manually or automatically

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