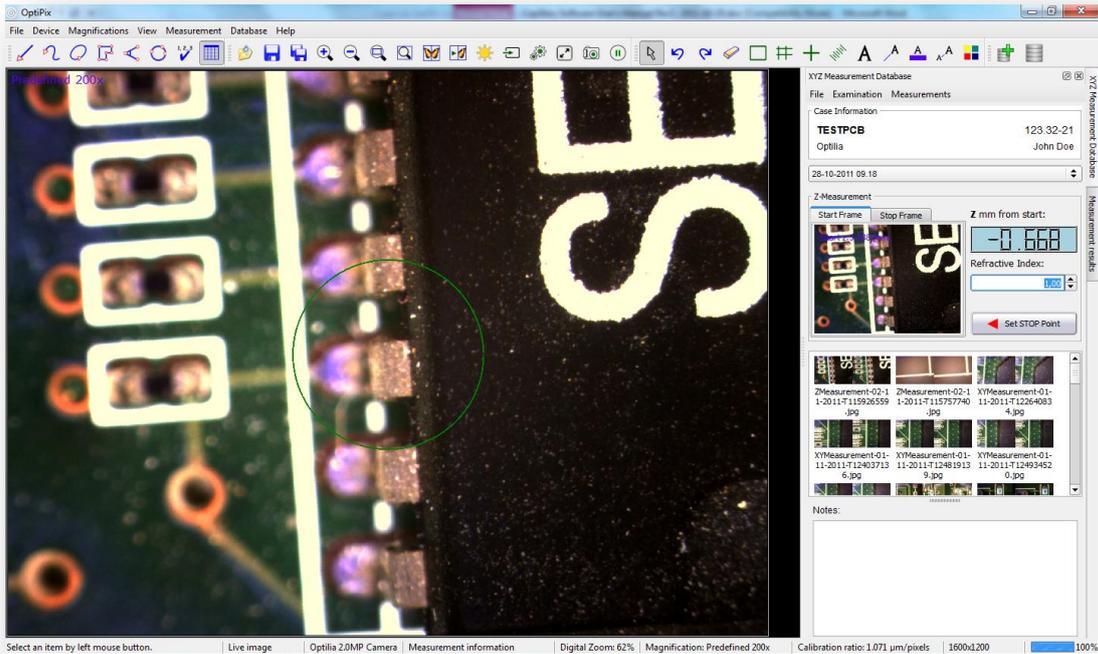# Opti*Pix* XYZ Measurement

User's Manual

This manual describes how to use OptiPix XYZ Measurement software

Table of Contents

1. Installation and Startup (First Run)

1.1 How to Install Opti*P*ix

Prior to installing **Opti*Pix***, user needs to install camera Device Drivers**.

To install Opti*P*ix user has to run the provided installer file. Double-click on it and a new window will be displayed.

    a) Click "Next" to continue.

    b) Choose a folder in where to install Opti*P*ix. Click "Next" and "Next" again to start the installation.

    c) When the installation is complete click "Close" to exit the window.

1.2 Using Opti*Pix* for the first time

1) Insert the software protection dongle into a free USB port on computer. If a full version of the software has been ordered, the protection dongle will be found inside the product box.

2) From Windows main menu, click "Start/All Programs/Optilia/OptiPix" and run **Opti*Pix***.

3) Select language from the list.

4) From the "Introduction" dialog box, select:

    a) "Full Version" if a full license has been ordered and the software protection USB dongle. All software functions will be enabled.

    b) "Lite Version" if a lite version has been ordered, image view, capture, annotation and only distance measurement on image will be enabled.

    c) 30 days trial version for trying the software for 30 days. All software functions will be enabled for 30 days. Skip part 7.

5) Fill in license number (found in the package) and the other requested information.

6) PLEASE READ THE LICENSE AGREEMENT CAREFULLY before using **Opti*Pix***.

7) Select device from the Input Device list. The software will start showing live image from the camera.
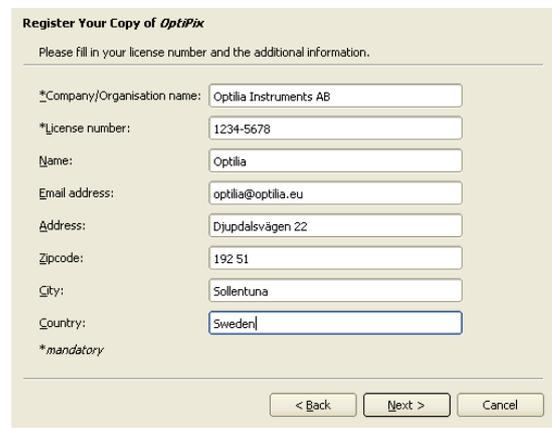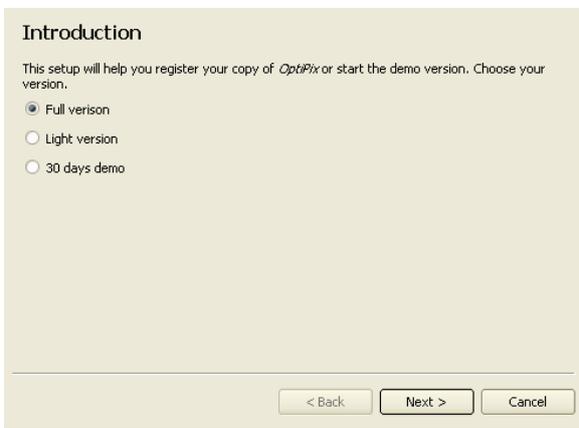
1.3   Language

It is possible to set language for Opti*Pi*x upon first start up. Alternatively, the language settings can be changed from the "File/Preferences" menu.
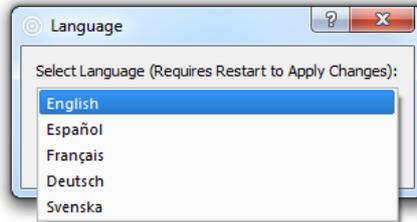
1.4   Device Resolution and Properties

A device has to be chosen upon the first start of the program. This device is stored in the register and will be automatically loaded at next start of OptiPix. It is possible to change input device later from "Device/Input Device".

To change device resolution click on this icon ⬚ or select "Device/Device Resolution".

To change device properties click on this icon ⚙ or select "Device/Device Properties".

Note: To quickly change Input Device, right click on the camera status label and choose desired device.

1.5   Preferences

1.5.1   OptiPix Preferences

In preferences, user can change the line thickness, the measurement units to metric to imperial, and define custom categories for counting. Preferences can be opened window from "File/Preferences".
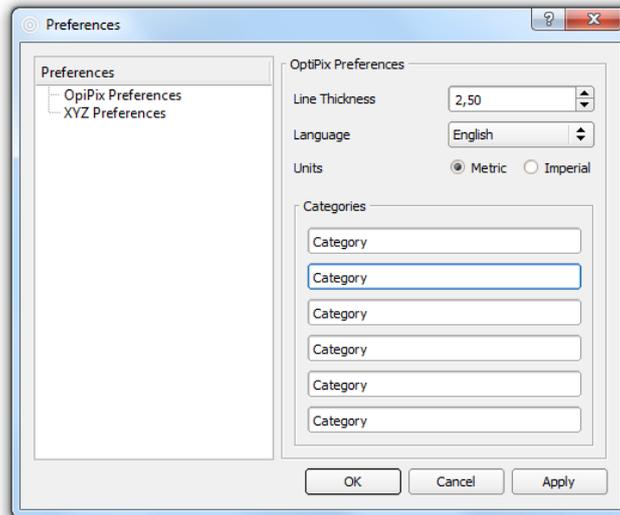
1.5.2   XYZ Preferences

In database preferences, user can change the database location and also add the additional information for new cases.

2. XYZ Measurement Database Overview

The XYZ Measurement Database is a database module to OptiPix. It allows users to, create, manage and archive pictures and data from XYZ-measurements. The XYZ-measurements helps the user to measure heights and thicknesses as well as measure dista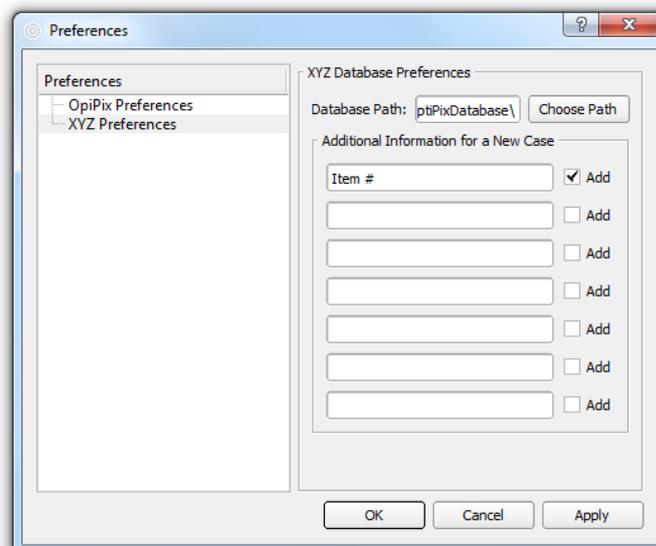nces within a larger area than the picture. The XYZ Measurement Database together with OptiPix is a user-friendly image capturing, analysis and archiving system for video XYZ-measurements.

2.1 Project Database and its Security

Software will be activated by inserting the provided dongle in a USB port of the computer where the software is installed. This dongle will also be the key to database security. The database can only be accessed if the correct dongle is used.

It is important to have a password-protected Windows login to the PC where the software is installed.

2.2 XYZ Measurement Database Components

Menu

Case information

Measurement results

Z - Measurement

Thumbnails

NotePad

2.2.1 File Menu

- New Measure: Create a new measure for current case
- Export Case: Export case data from database to windows file system.
- Create Report: Create a PDF report of the inspection.

2.2.2 Case information

In "case information view" the name, id-number, company and operator of the current case are displayed. Inspection date and previous examinations are also displayed. For more information about management of the examinations, please refer to "Working with a Case"

2.2.3 Z-measurements

The Z-measurement interface helps user to perform measurements using the measurement instrument. This interface contains the start and stop frame. The start and stop frames displays the first respective the second captured image together with the measured value. The interface also contains the current distance from the start frame as well as a trigger button. For further instructions on the XYZ-measurements, please refer to XYZ-measurements.

2.2.4 Toolbar

The toolbar includes the functionality to record audio.

Record Audio

2.2.5 Inspection folder

Double-click on a picture or document to open it.

Right clicking a picture will open a pop-up menu where the user can open the image, open the text file associated text file for writing comments about the image, save a copy or delete the image.
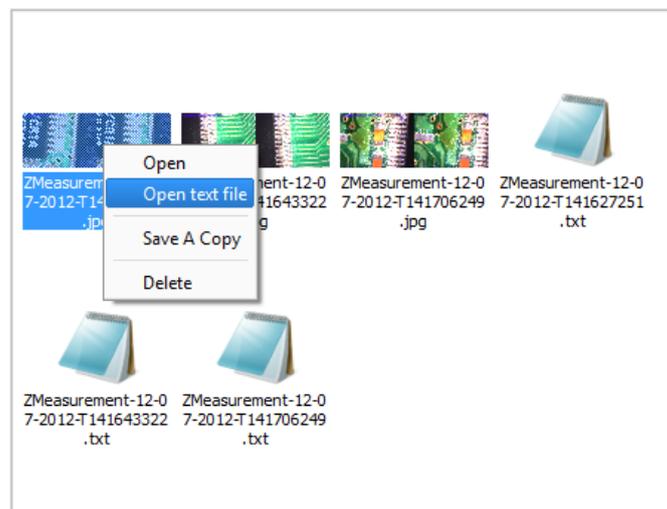
2.2.6 Note Pad

Write notes about the current examination in the notepad. Written text will be saved and loaded automatically for each examination.
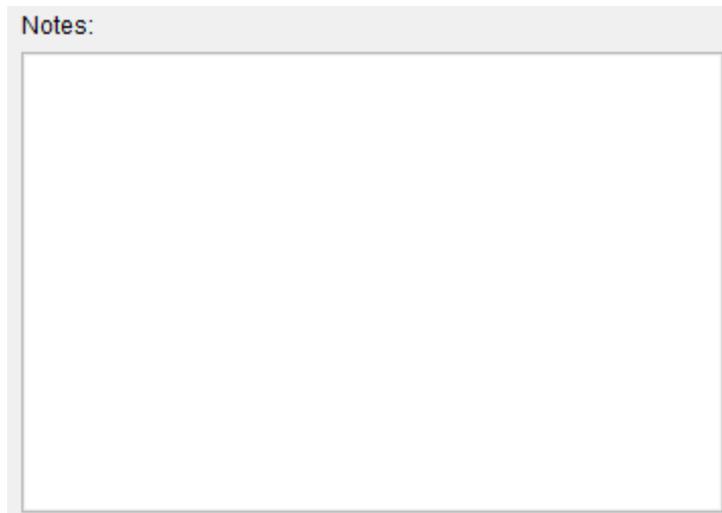
Notes:

3. Starting and Initializing the XYZ Measurement Database

1. Make sure to have the USB Dongle for Opti*P*ix XYZ is plugged in to an available USB Port.
2. Start the software. Case manager will be opened automatically.
3. Load one of the existing cases or click "*New Case*" to add a new case. To get more help with case manager, please refer to *Section 4: "Case Management"*.
4. The Case Manager can be closed and the user can work with the local Windows file system without having a connection to database. Refer to *"Section: 7   Working with Local Files"* to get more help on working with file system.
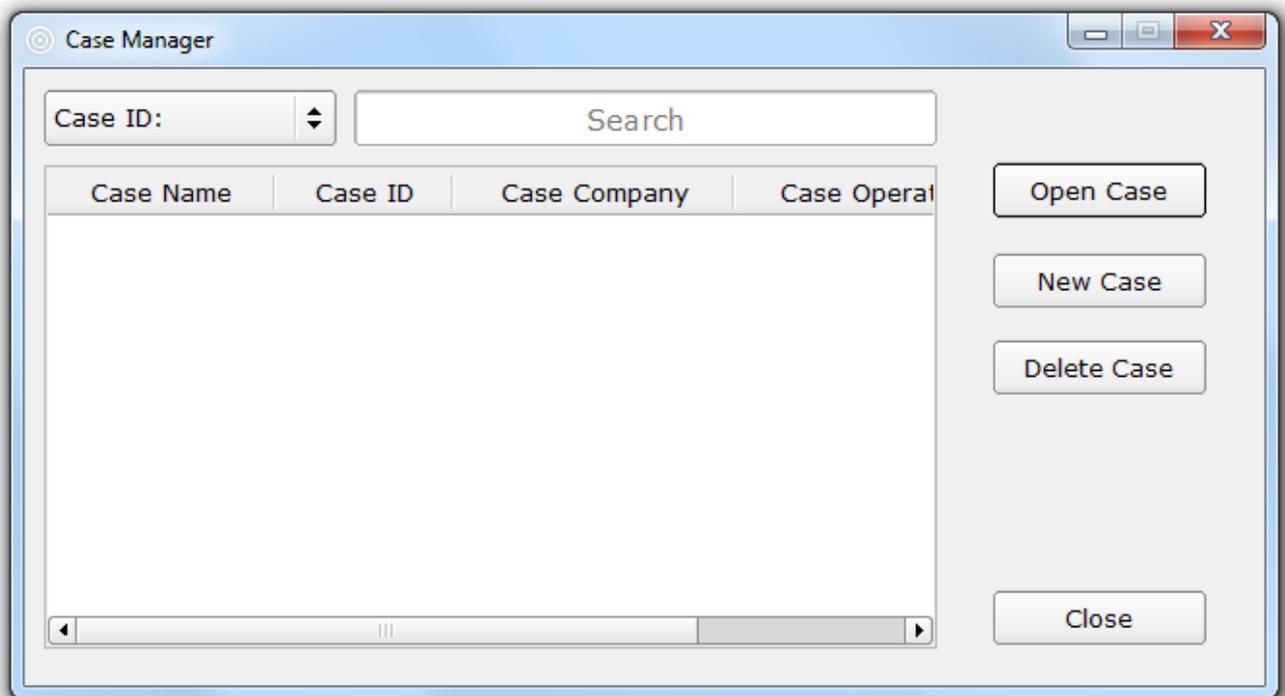
4. Case Management

Case Manager allows the user to add new cases or search and open an existing case in the database.

Search Category　　　　　**Search Field**
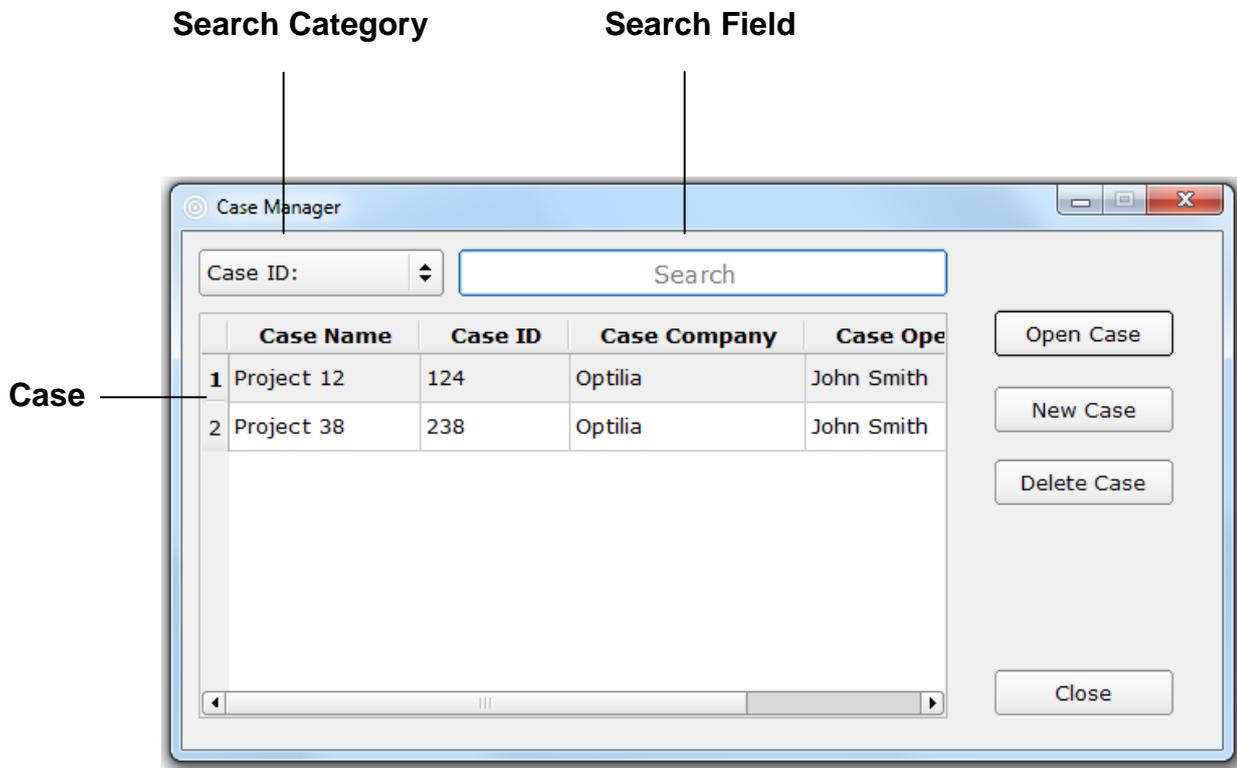
Case

Case Manager is opened automatically when the software starts. It can also be opened from the menu; "Database/Open Case Manager" or by clicking this icon.

4.1　Adding a new case

To add a new case, click "Database/New Case" or on this icon and fill in the relevant information. A new examination folder with the current date will be created and a case will be opened automatically.
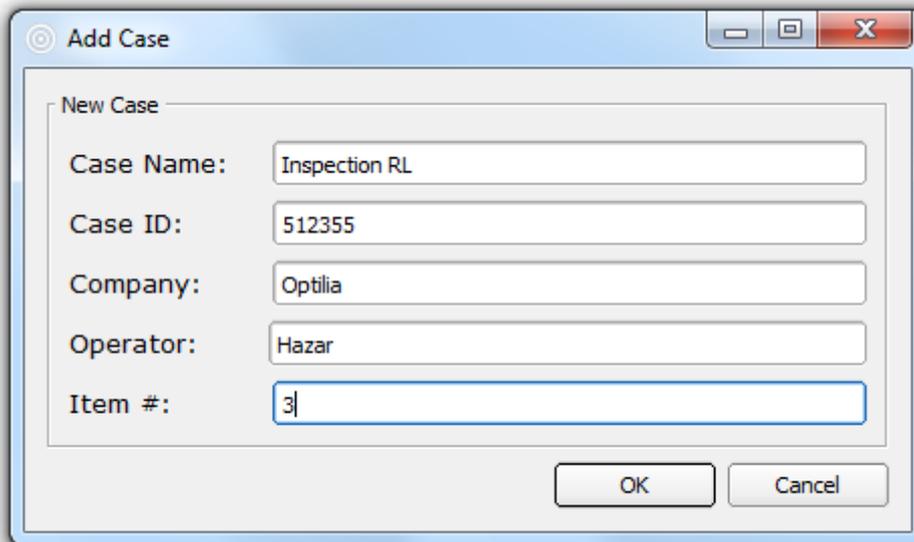
4.2 Opening a Case

Open Case Manager. Double click an existing case or click Open Case.

4.3 Finding a Case

Search the database by Case Name, Case ID, Case Company, Case Operator. The search result will be displayed as the name is being typed.
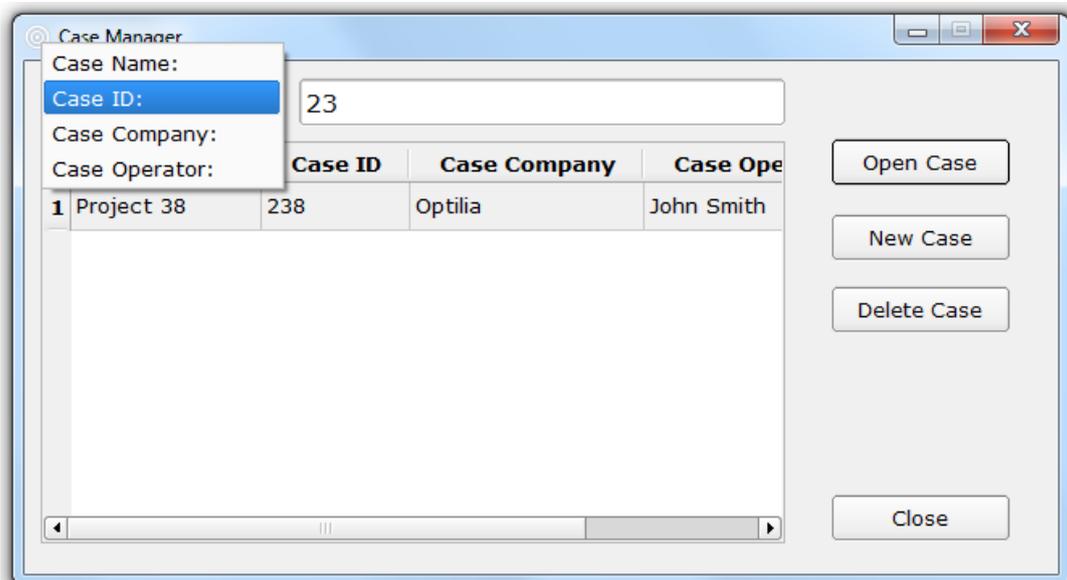
5. Working with a Case

Inspection folder contains all data of each inspection. Open the Case Manager to create a new or load an existing case.

5.1 Managing Inspections

When a new case is created, a new inspection folder is also labeled with current date and time. If an existing case is opened, the most recent inspection will be loaded. All other old inspections can be loaded by selecting them from the drop-down inspection list.
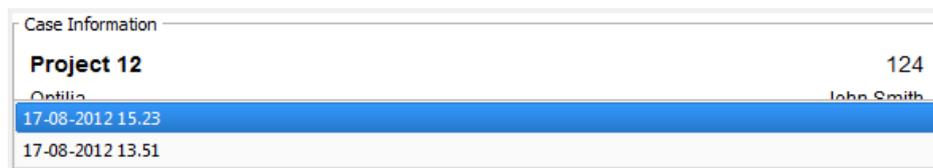
To add a new inspection to the case, click "File/ New Inspection" from the database menu.

5.2 Capturing an Image

Capture an image by pressing F11 of your computer keyboard, pressing the foot pedal or the image capture button of the Flexia Definition. For live and still image functions, please refer to *"Section 8: Open and Save Images"* .

When a user double clicks a recorded image in the finger folder, the image will be displayed for measurement or analysis. For measurement tools, please refer to "Section 6: XYZ Measurements" and *"Section 10: Measurement Analysis"*.

5.3 Writing Notes

Comments and text for the current inspection can be written in the Notepad.

5.4   Writing notes for the image

Comments and text can be written for a specific image by right clicking on the image and choose "*Open text file*". A new window will be opened, showing information about the image, where the user can write comments about the image. These comments will also be part of the report if the image is included.
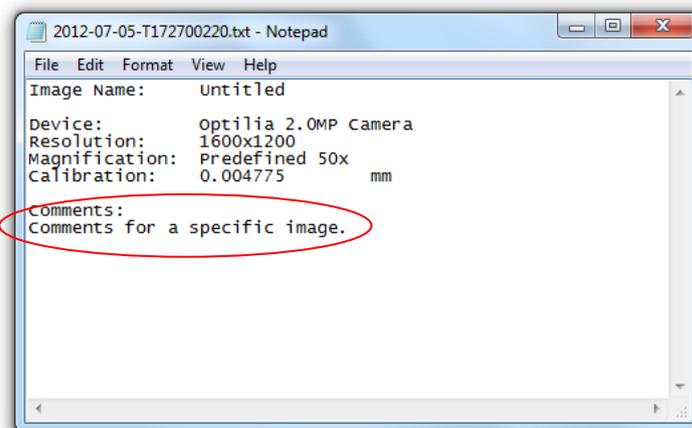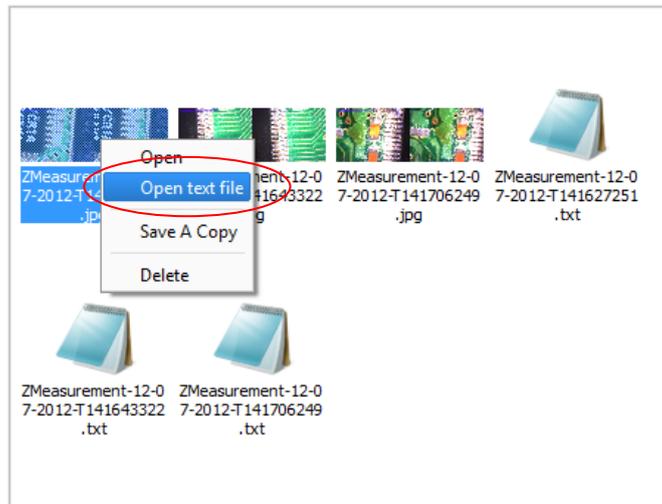
5.5   Recording Audio

To record an audio memo, connect your microphone before starting Opti*P*ix and click this icon 🎤 in the Database toolbar.

Audio level bar will be displayed. Click stop icon to stop recording. An audio file will be created in the folder. Audio recording will stop automatically in 3 minutes.
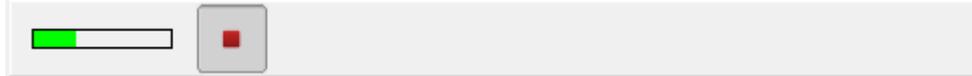
A20082012_110905
.wav

_____   **Audio File**
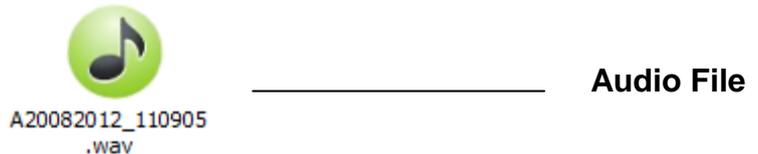
Note: *OptiPix uses default audio recording device of the computer. If the audio level bar doesn't respond to your voice, check the default audio recording device from Window Control panel and set to microphone input if it is not already selected.*

5.6   Reporting and Exporting Cases

Exporting Case

To export the documents from the database, click "File / Export Case" on the database menu. For each examination, all images and reports will be exported to a user selected folder.

Exporting Image

To only export a single image, click "File\Save a Copy" or this icon .

Creating Report

The user can create an inspection report interactively by clicking "File/Create Report" on the database menu.

There are 4 main Sections in the report,

- **Menu**
  Save and load report templates as well as saving a PDF report for printing and/or e-mailing.

- **Title**
  User can add logo and title to a report by clicking on the respective area. To save the logo and title as a template, click "File/Save Template". To open a saved template, select the desired template by clicking "File/Open Template". By clicking File/New Template, the user creates an empty template.

- **Inspection Details**
  All the case information and the notes from the inspection will be automatically shown in this area.

- **Image Area**
  User can add up to eight images by clicking on them in the inspection folder. To remove any image from the report, click on the image in the report.

Menu — File

Title

Click here to add Logo

Click here to add title and address

2012-08-22

Inspection details

Case Name:	Case ID:	Company:	Inspection Date:
Inspection RK	Optilia	512354	12-07-2012 13.13

Additional Field 1:
Additional field from preferences 1 (up to 7)

Additional Field 2:
Additional field from preferences 2 (up to 7)

Notes:

Image area

Click on an image to insert into report	Click on an image to insert into report
Click on an image to insert into report	Click on an image to insert into report
Click on an image to insert into report	Click on an image to insert into report
Click on an image to insert into report	Click on an image to insert into report

Alexander

Printed name of Operator

Signature of Operator

Saving Examination in PDF for Printing/Emailing

Click "File/ Save PDF" to save a PDF file of the report for printing and/or e-mailing. A PDF report will be generated and displayed. The detailed information of each image such as measurement and comments will be added automatically to the report. A PDF reader must be installed on the PC.

6. XYZ-measurements

The Z-measurements uses external measuring instruments to measure objects with the video from the microscope. To use these measurements you need to connect the measurement instruments.

The XYZ-measurement is automatically started when opening the XYZ Measurement Database.

6.1 Installing the measurement instruments

To install the measurement instruments you first need to connect them properly to the computer. First of all the measurement instruments is connected to the DMX-data transmission box. This box is then connected to the computer via USB. The pictures below show how to connect the measurement instrument to the computer.

There are two drivers that have to be installed to use the DMX box. These drivers enable OptiPix to communicate with the DMX-USB via a virtual communications port (VCP). The first driver is a USB serial converter which establishes the connection to the DMX-USB through the USB interface and makes the data transfer availably to a virtual communications port (VCP). The second driver is this virtual communications port (VCP) which allows OptiPix to contact the DMX-USB.

To install the drivers first connect the measurement instrument according to above description and insert the provided CD then follow the steps:

1. Go to the *Control Panel* in *Windows*. Open the *Device Manager* via *System and Hardware.*

2. Find the DMX1-USB device in *Device Manager*. It should have an exclamation mark on it. See image below.
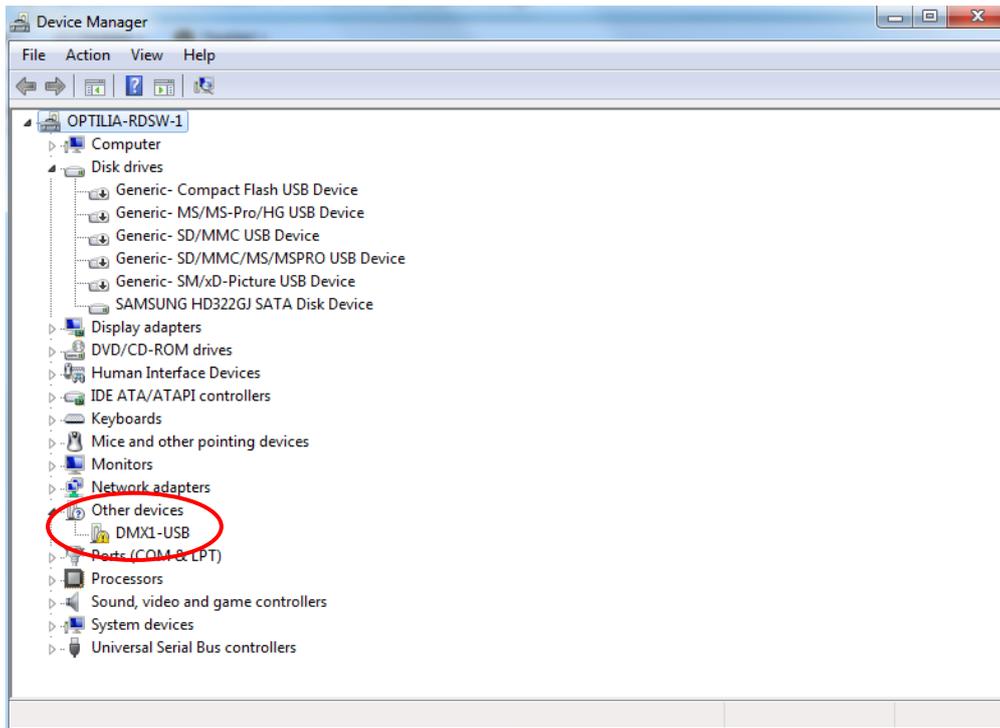
3. Right click on the DMX1-USB device and select *Update Driver Software...*

4. Select, *Browse my computer for driver software*.

5. Browse for the location of the CD partition and click *Next*.

6. Choose *Install this driver software anyway* when windows informs that it can't verify the publisher.

The second driver should be installed the same way!

When starting the XYZ Measurement Database of OptiPix the software will automatically find the measurement devices that are connected to the computer. If there are no devices connected or if they are incorrectly connected a pop-up will inform the problem. Connect your measurement devices and press *Connect to device,* the software will then again try to find the measurement devices.
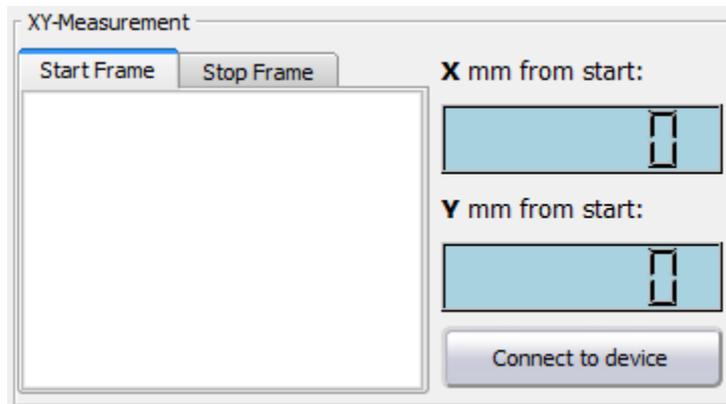
6.2 Z-measurement

The Z-measurement is used together with the focus of the microscope to measure a thickness or height on an object in the video. The following steps are done to make a Z-measurement.

Start by setting focus on the surface you want to start measuring from. Use the video view in OptiPix analysis window to set the focus. When the surface is in focus you press "Set START Point".
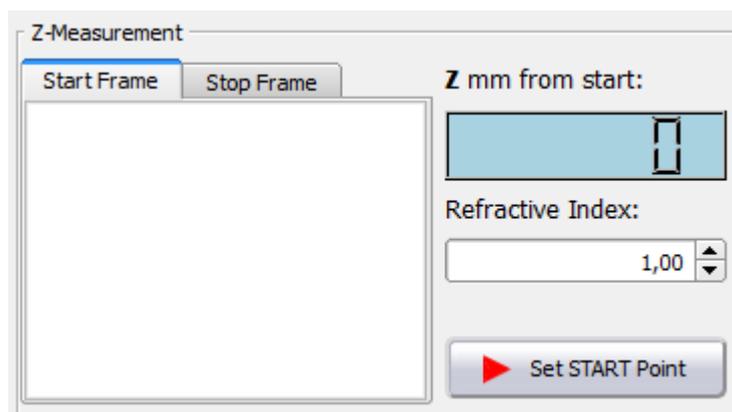
When a start point has been set the start image can be viewed in the start frame and the Z-distance from the start will displayed in the digit field. The Refractive Index parameter is used when not measuring in air. For example when measuring the thickness of a protection coating you enter the refractive index of the coating in the Refractive Index box. The distance showed in the digit field is always the length read from the measurement instruments multiplied with the refractive index.
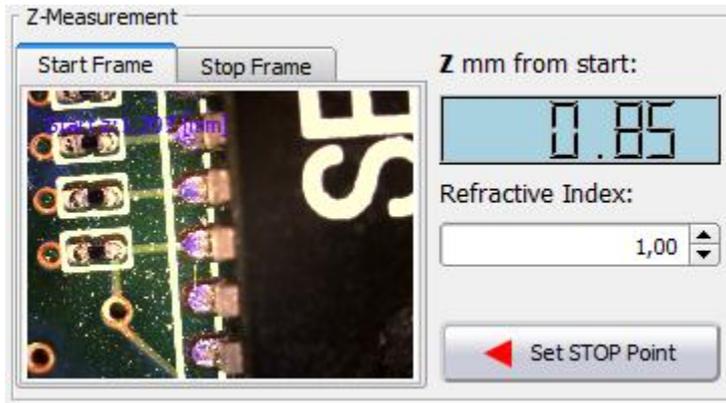
Continue by moving the microscope to set the focus on the surface you want to measure to. While moving the microscope the current distance from the start point will be display in the digit field. When the stop surface is in focus, click "Set STOP Point" to finish the measurement.
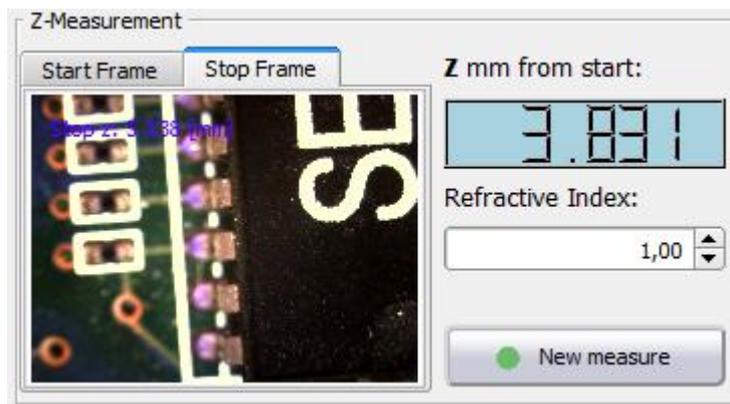
When the stop point is set both the start and stop image can be viewed in the start and stop frame. The distance between the start and stop surface is displayed in the digit field. An image of both the start and stop frame has been saved in the current examination folder. The measurement result is burnt in to the image; an example of such an image can be view below. To make a new measurement, click "New measure".
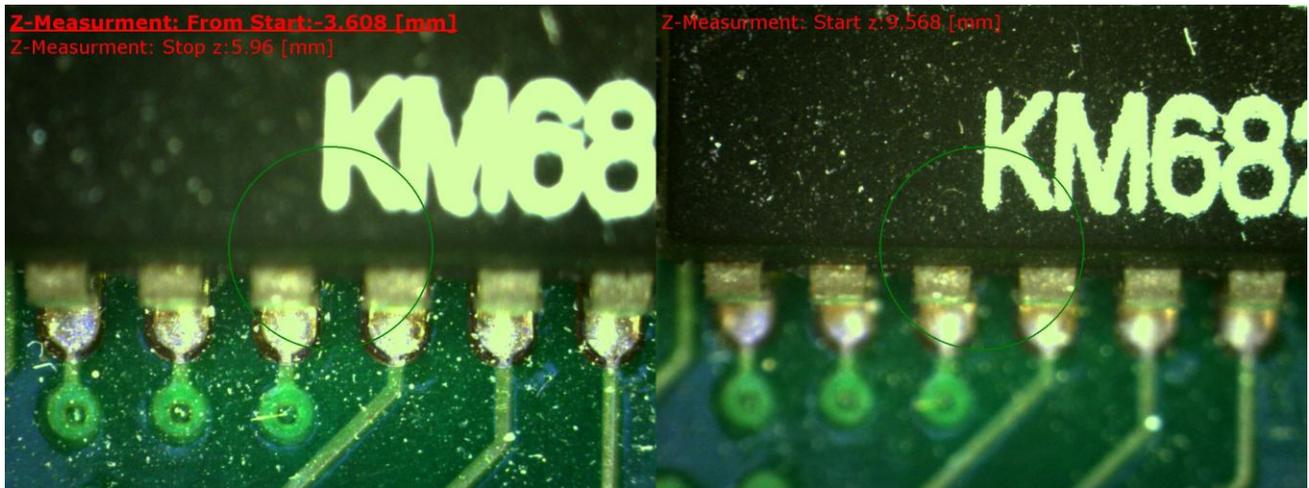
Note 1: Use the green help area to keep the start and stop point centered in the image.

Note 2: Optical Path of the image rays in other material than air (vacuum) is L(n) = L(air) x n, where "L" is the thickness of the material and "n" is the refractive index of the material. This means that the actual thickness of a protective coating on a PCBs is "n" times the height of the measured thickness which is calculated by OptiPix.

6.3 XY-Measurement

The XY-measurements enables distance measurements directly on the screen. Opti*P*ix provides a lot of different types of measurements and it is recommended to use the distance measurement to measure x and y measurements. Please refer to [Measurement Analysis](#) of OptiPix for measurement and analysis tools for further functionality.

7. Working with Local Files

In the folder structure, the user can choose the folder destination in which to save or recall images. Choose a destination folder by selecting "File/Set Destination Folder". The images in this folder are displayed as thumbnails beneath the folder structure. To hide the folder structure, click this icon .

To create a new folder, click this icon or right click inside the box to choose new folder.

The created folder will now be the destination folder.

Note: *By right clicking in the file structure or on the thumbnails user can choose from a number of different tools like copy/paste and rename.*

8. Open and Save images

To open an image but keeping the destination folder click this icon 📨 or select "File/Open Image", then choose which image to be opened.

To load a thumbnail image or a document from the destination folder, double-click on it or right click and choose open. If the image contains measurement objects, the measurement results will also be loaded. Note that these measurements are part of the image and cannot be changed as they are "burnt into" the image.

To save an image, there are two options:

- Save the image with a user specified name. The measurement results will be saved with the same name. The image is stored as a .jpg file and the results as .txt file. This is done by clicking on this icon 💾 or selecting "File/Save Image". *Hot key: Ctrl + S.*

- Take a snapshot of the image. The file will be automatically labeled with date and serial number. This is done by clicking this icon 📷. *Hot key: F11.*

To export the measurement results only, right click on the measurements results table and choose "Export Measurement Results" or select "Measurements/Export Measurement Results". This file will be saved in the destination folder.

9. Magnifications and Calibrations

9.1   Magnification

To create a new magnification, select "Magnifications /Edit User Magnifications", and then click on the "Add…" button to add a new magnification. See picture below. Select the new magnification and click on the OK button. To start calibrating, click on the calibrate icon. See next section for further instructions
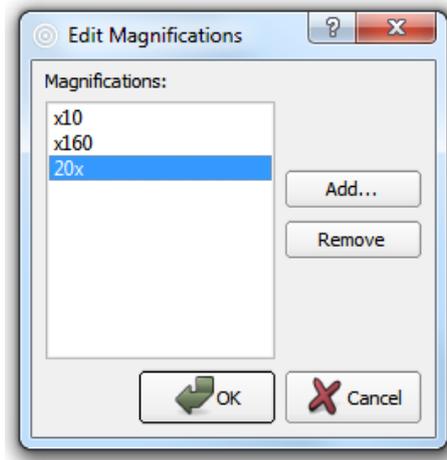
For quick selection of magnification, right click on the Magnification (bottom of the OptiPix window) and choose desired magnification.
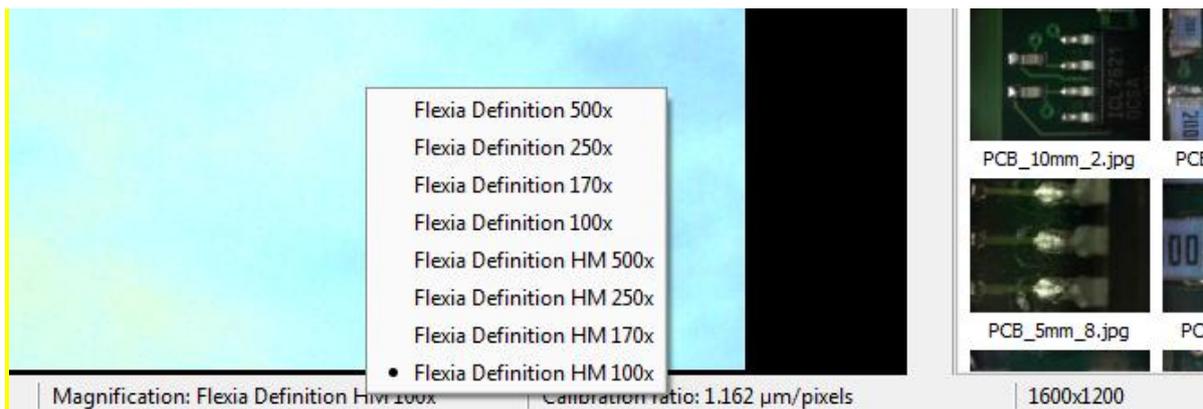
9.2   Calibration

To calibrate a selected magnification, place a Micrometer Scale or a Ruler (depending on the magnification of current optics) in the live image and focus. To calibrate, select "Magnification/Calibrate Magnification". The image of the Micrometer Scale or the Ruler will be frozen and a new dialog window will appear. See image below.
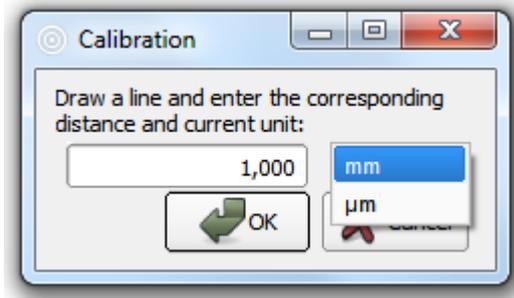
On the image, click-and hold to drag the desired distance.

Type in the distance and select the desired unit. If imperial units are selected in the preferences, imperial units are shown in the calibration window. Selected calibration ratio will be seen on the status bar at the bottom of the Opti*P*ix window.

Note 1: Predefined magnifications cannot be calibrated.

Note 2: The last calibration used will always be stored upon closing the program, and reloaded when starting the program.

Note 3: The selected calibration will always be saved together with the image.

10. Measurement and Analysis

10.1 Measurements

There are several ways measure on the picture. It is possible to measure distances, radius, curve length, areas and angles. If no magnification has been selected the measurement results will be presented in pixels.

Before making measurements, current magnification (e.g. optical lens) should be calibrated in the software. See section Magnification and Calibration.

- Distance

To measure a distance click on the icon or select "Measurements / Distance ". Click and drag the distance to measure in the image.

- Radius

To measure a radius, there are two different methods: either by selecting three points on the perimeter, or by dragging the radius. In order to use the first method, press the icon or select "Measurements/Radius/Radius 3 Points". In order to use the second method, select "Measurements /Radius/Radius By Radius".

- Angle

To measure an angle, there are two different methods: either by selecting three points or by drawing two lines. In order to use the first method, press the icon or select "Measurements/Angle/Angle 3 Points". In order to use the second method, select "Measurements/Angle/Angle 2 Lines".

- Curve

To measure a length of a curve, press the icon or select "Measurements / Curve". Click and draw the curve in the picture.

- Area

To measure an area click on the icon or select "Measurements / Area". Click and draw the perimeter of the area. The area will close when releasing the mouse button.

- Polygon

To measure using a polygon click on the icon or select "Measurements/Polygon". Click the polygon's corners and double-click to close it.

- Count ✔ [1, 2, 3]

To count objects click on the icon or select "Measurements / Count". A new window will appear where users can choose a category. When user has chosen desired category, start counting objects in the image by clicking on them. When you name a category, the counting object will be marked with the first letter of that name in a certain colour. In the measurement results window, however, the full name will be displayed. To count using another category, simply choose another category in the category window. When finished counting objects, press done. To modify the name of the categories, go to "File/Preferences".

Note: Make sure not to close the category window while counting.

- Select

To use the selection tool click on the icon or select "Measurements/Select". Select an object (measurement) on the image to change, move or delete it.

Note: When selected, right click on the object to change or delete it.

- Export Measurement Results

Measurement results are recorded in a "text" file with same name as the image file in current destination folder. The results can also be exported to a new text file and/or renamed.

10.2 Annotation

- Text A

To write text in an image click on the icon or select "Measurements/Text". Click on the image to put the text. A new window appears where user input the text.

- Annotation with Line A

To write an annotation with a line, click on the icon or select "Measurements/Annotation Line". Draw the line and a text window will appear. Write a text or leave it blank.
*Note: Leave the text blank to just draw a line.*

10.3 Tools

- Compare Images

To compare images click on the icon or select "View/Compare Images". A new window will appear. Select "View" and choose between 1, 2 or 4 images. To start comparing images drag one thumbnail and drop it onto one a frames in the compare window or double-click the thumbnail, see image below. To clear the compare view, right click on the image to clear, or click to "File/Clear Window" to clear all images.

The user can Zoom In/Out and rotate each individual image. Slide the rotation bar or click the rotation buttons to rotate the image up to 180 degrees.
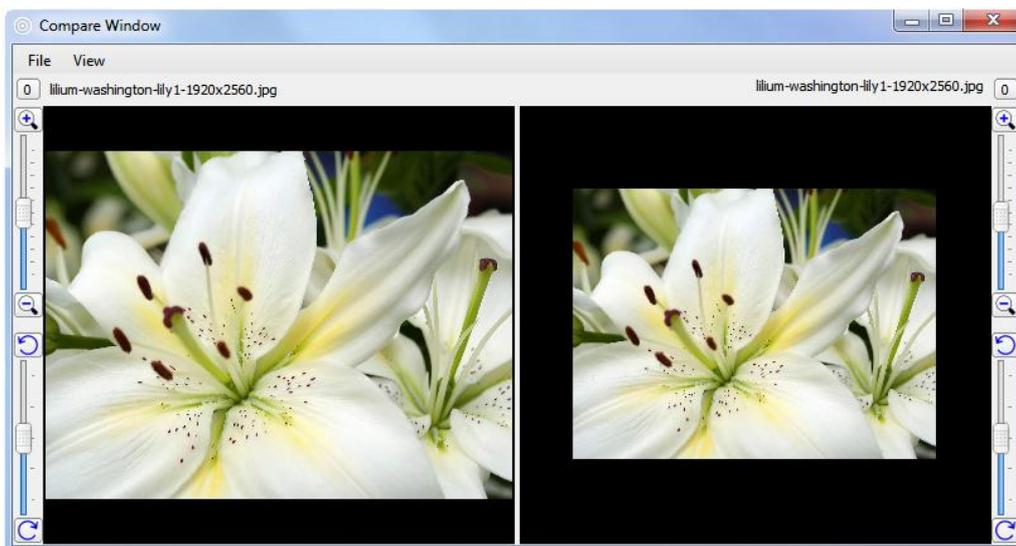

- Compare Live Image

To compare the live image with a reference image, click on the icon or select "View/Compare Live Image". A new window will appear. To start comparing images drag a thumbnail and drop it onto the reference image frame in the compare window, or double-click to the thumbnail.

The reference image can be saved and reloaded by clicking "File/Save Compare Live Window" and "File\Load Compare Live Window".

- Image Adjustment

To adjust colour, contrast and other graphics properties of the image, click on the icon or select "View/Image Adjustment". A new window will appear. If Opti*P*ix is in live or still image mode different windows will be shown.

In *live image mode* user can only flip the image and change the contrast.
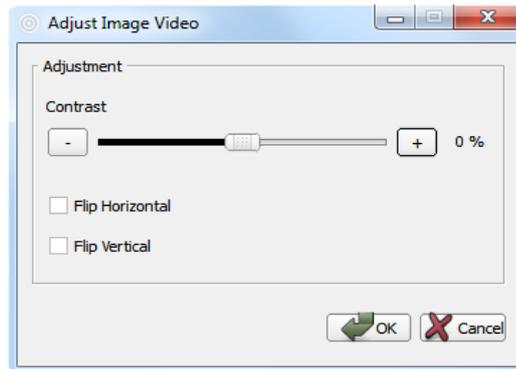
In *still image mode* user can also change the red, green and blue colour mix as well as brightness and contrast.
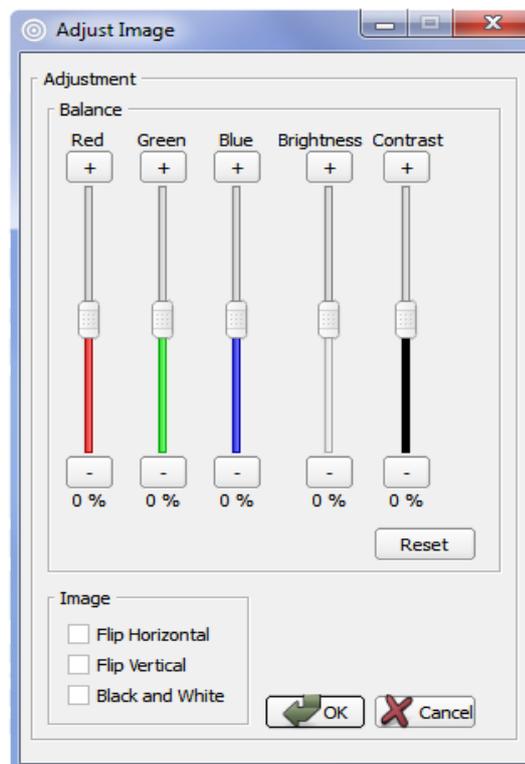
Note: Select both flip horizontal and flip vertical to rotate the image 180°

- Ruler

To show the ruler click the icon or select "Measurements/Show Ruler". The size of the ruler depends on the current calibration. To rotate the ruler, select the object and right click on it.

- Grid

To project the grid on the screen, click on the icon or select "Measurements/Show Grid". A new window will appear to input the size of each grid cell in mm or inches.

- Crosshair

To project the crosshair on the screen, click on the icon or select "Measurements/Show Crosshair".

- Rectangle

To project the rectangle on the screen, click on the icon or select "Measurements / Rectangle". A new window will appear to input the length of the sides of the rectangle in mm or inches.

- Graticule

To project a reference (semi-transparent) image on screen, click on the icon and select the reference image with exactly the same resolution as the live image. Opti*P*ix will automatically switch to full screen and project the graticule over the live image. Press ESC to exit full screen.

- Change Font & Color

To change the font click on the icon. A new window appears where user can choose font type, colors for the text. This will be stored in the register.

- Change Color of objects

To change the color of the objects click on the icon. A new window appears where user can choose colors of the objects. This does not affect the color of the grid nor the crosshair.

Zoom and Panning

There are four ways to zoom digitally, both in live and still image mode: zoom in, zoom out, zoom to fit and full size. Turning the wheel of the mouse zooms in/out, using the cursor as centre of the image.

- Zoom In

  Zoom in by clicking on the icon or select "View /Zoom In".
  Hot key: F4.

- Zoom Out

  Zoom out by clicking on the icon or select "View /Zoom Out".
  Hot key: F3.

- Zoom to Fit

  Zoom to fit the screen size by clicking on the icon or select "View /Zoom to Fit".
  Hot key: F2.

- Full Size

  To apply full size (no digital zoom) select "View/Full Size".
  Hot key: F5

- Full Screen

  Zoom to full screen by clicking on the icon or select "View/Full Screen". Hot key: F6. To close the full screen view press ESC. The snap and the trigger functions will work as usual even under full screen view. In Full Screen mode, the user can browse through images by turning the wheel of the mouse. A right click will give the option to exit Full Screen mode.

- Panning

  To pan the image when zoomed in, use the middle button of the mouse, or click on the icon.

11. Notes

12. System Requirements

Component	System recommendation
Computer	Intel Core i5 2,3 GHz or similar Recommended systems: Station: HP Pro 3500 MT, Win7P or similar Laptop: HP ProBook 4740s 17.3" HD+ LED or similar
Operating System	Windows XPP, Windows 7P (32 or 64 bit
Memory	1GB or higher of RAM, Recommended: 2 GB
Hard disk	Minimum: 10 GB of Free Space Recommended: 100 GB of Free Space
Display	Laptop: 15 / 1600x900 (HD+) PC: 22" /1920 x 1080 (Full HD) Recommended: Laptop: 15 / 1920x1080 (Full HD) PC: 24" /1920 x 1200
Graphic card	Direct X compatible graphics card is recommended to avoid unnecessary load on the CPU. Avoid using integrated simple graphics cards. Recommended: ATI Radeon HD 5000/6000 Series nVIDIA GTX 500 Series
Other	Three USB2.0 ports. PCI express x1

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