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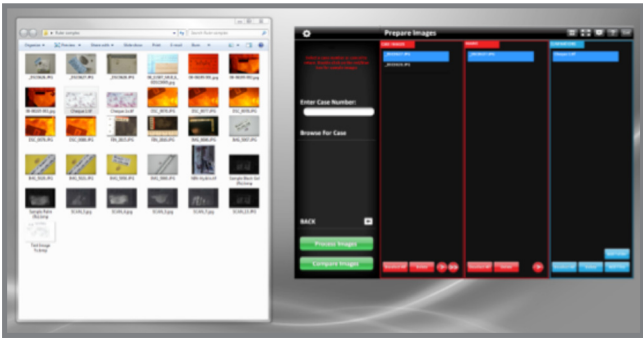
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THE FISH DIGITAL COMPARATOR

The main goal of the fingerprint expert is to deliver reliable conclusions. With fingerprints of good quality and ten prints, there is generally no room for interpretation and error and hardly any chance of mistaken judgement on identification. However the poorer the detail at hand, the greater the role of the expert becomes and they need to compare, judge and validate. Mistaken identifications have some common causes; the fingerprints under examination are of bad quality and/or there is time pressure to achieve a match.

The FISH Comparator

The Comparator, designed to work on notebook and desktop computers, delivers its full effectiveness when used with a dual screen hardware configuration. This enables you to work with the images on one screen whilst using the other to manage image files and case folders. The screenshot to the right shows the Comparator, on the right, next to the image folder:



Working with the application in this way, you can highlight the image files on the left and drag the files to the desired location in the Comparator. As you work with the application, you will establish your own method of working with image files by controlling the colours, sensitivities and scale of the images. The speed and productivity of your image comparison and analysis increases as you learn the functionality of the Comparator. For example, you can have two of the screens open together as shown to the right:



THE COMPARATOR LENDS ITSELF TO EITHER A LARGE WIDE SCREEN OR THE OPERATORS' CHOICE OF TWO SCREENS, WHERE THE MAIN SCREEN IS A TOUCH SCREEN AND THE SECONDARY AN ADMIN SCREEN.

Please note that some of the screens and menus may differ slightly in this document to the version of the Comparator that you have running on your computer.

COMPARATOR CONCEPTS AND FILE MANAGEMENT

The menus and layouts of the screen emulates the process of image collation, mark extraction, level 1 recommendations, level 2 ridge analysis and marking up. You can either follow the process serially or go direct to the individual screens.

The following rules are applied to the Comparator;

- Images (files) can never be deleted or overwritten. If there is a clash of file names the Comparator will increment the new file name with a number or letter.
- Original images (files) can never be altered in anyway other than changing file names. Images that need to be changed (processed) will be saved with a name convention of .dp (digitally processed).
- The Comparator design restricts images from one case being saved in another case

There is the concept that digitally processed files should never be processed a second time and that secondary processing should refer b to the original. The operator's standards and practices will determine the approach.

FILE MANAGEMENT

The naming convention for files saved after processing is as follows:

- [CASEWORK]\case number\case number 'exhibit reference' 'sub divider' 'process identifier' '.ext'

The sub divider is by default set to '_N' which means for files with the same name then FISH will increment the file name with an underscore and a number. This can be either a number (N) or letter (A) with optional first character like _ or -

The 'process identifier' is either for original files generated by FISH such as scans and clipboard images or those that are processed for example cropped and converted to grey. Examples are:

- Scan an image: C:\Casework\JOB123\JOB123 EXHIB1.or.tif
- Then crop it: C:\Casework\JOB123\JOB123 EXHIB1.dp.tif
- Then change the contrast: C:\Casework\JOB123\JOB123 EXHIB1_1.dp.tif

SUPPORTED FILE FORMATS

The Comparator supports the following file formats:

- TIFF, JPEG, JPEG2000, PNG, BMP, Cannon RAW (.cr2), Sony RAW (.arw), Nikon RAW (.nef), Fuji Film RAW and Hasselblad (.3fr).

The system configuration panel, shown below, changes the Comparator settings. The recommended file format is TIFF LZW or JPEG2000 with lossless compression. TIFF LZW is TIFF with lossless compression, which on average gives 4:1 compression whereas JPG2000 lossless has a 4/6:1, with both formats not losing any quality.

THE INTERFACE

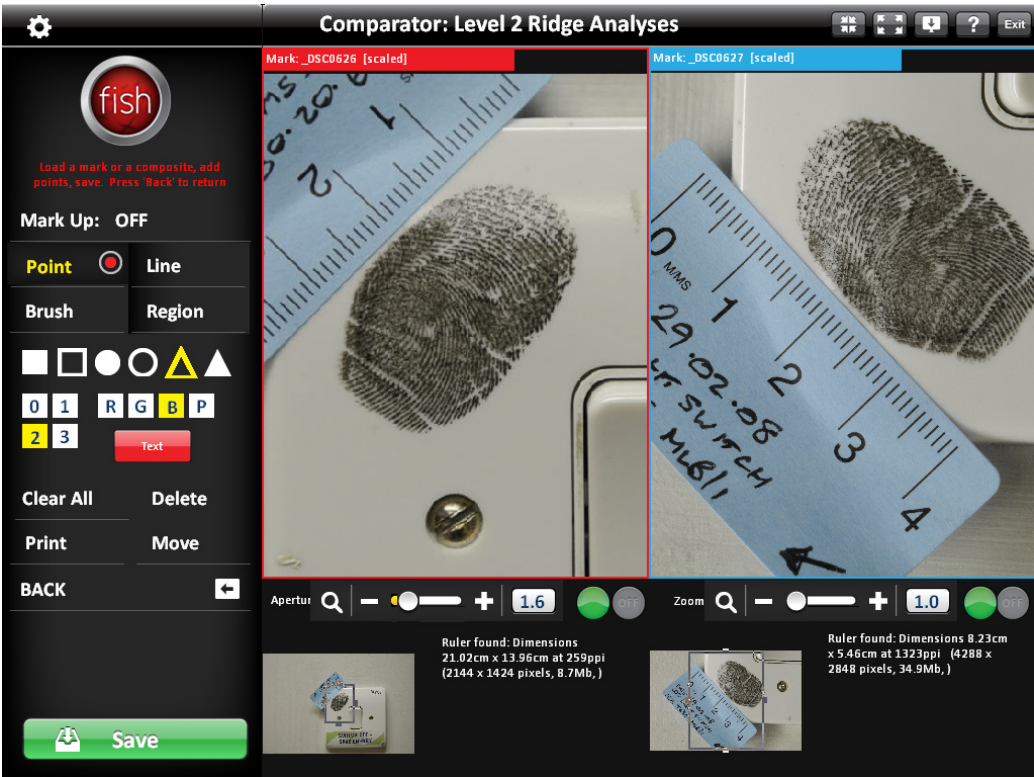
GENERAL LAYOUT

1. HEADER:

At the top of the screen is the Header, which appears in the pages throughout the Comparator

2. CONTROL AREA:

This area is where all the primary program controls are displayed. They change as you move through the program



3. ACTIVE AREA:
This area is where you primarily interact with the comparator and changes as you move through the program

THE HEADER:
The header is present at the top of every screen in the FISH Comparator Software. It provides access to system wide functions at any time you are using this software. Details of these functions can be found in the column to the right.



HEADER ICON FUNCTIONS

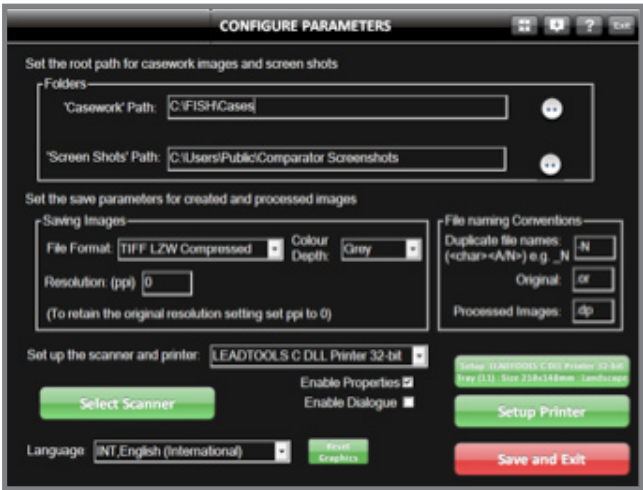
- CONFIGURATION**
See next page
- MINIMISE**
Minimises and hides the screen from view
- MAXIMISE**
Expands the panel to full screen, with the button changing to restore the smaller screen size
- REFRESH**
Refreshes the Comparator Screen
- SAVE SCREEN**
Saves an image of the screen in the location chosen in the Configuration Parameters
- INFORMATION**
See next page
- EXIT**
Through the overwring extis

SYSTEM SCREENS / INFORMATION ENTRY

SYSTEM SCREENS

THE CONFIGURATION SCREEN

Clicking the configuration icon allows you to configure parts of the Comparator as shown:



THE INFORMATION SCREEN

Clicking the configuration icon allows you to configure parts of the Comparator as shown:



INFORMATION ENTRY

Thoroughout the program, there will be instances where you may be required to input textual information. Anything you need to do this, all you need do is select that entry field and a data entry panel such as the one to the right will appear. Once you have completed your entry and pressed 'Enter' it will disappear from view again, leaving you free to continue your work.



WELCOME SCREEN

WELCOME SCREEN

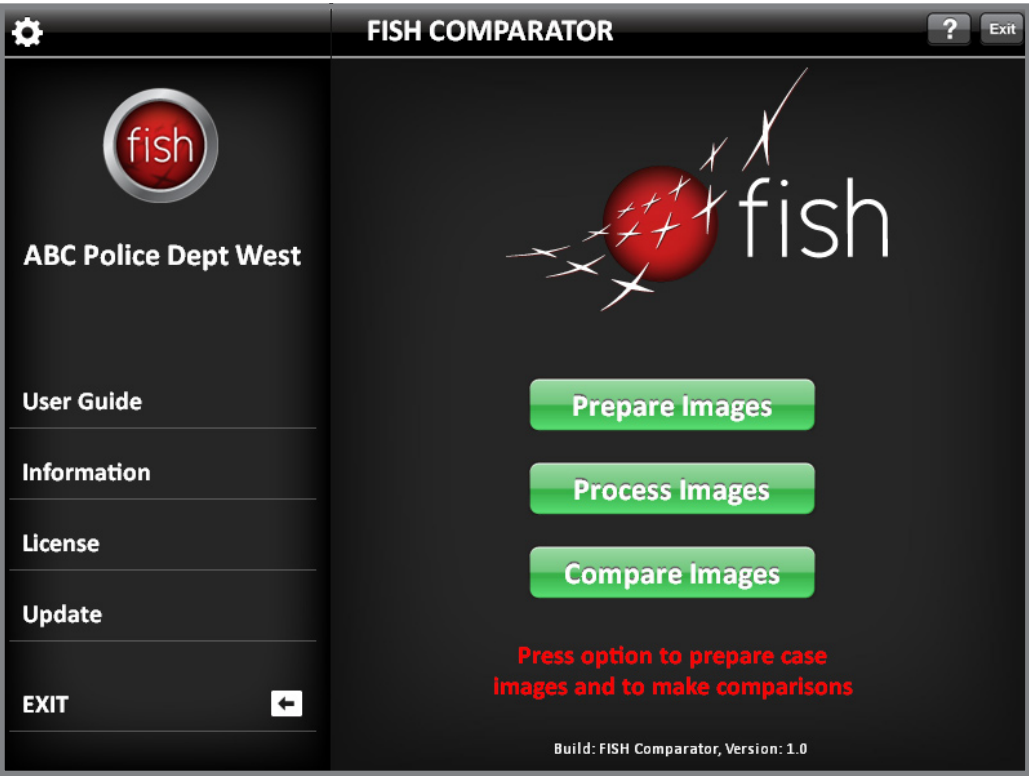
On starting up, the Comparator gives you the option to prepare, process or compare images as shown in the green buttons.

USER GUIDE

On the left of the Welcome Screen, you can access the user guide, this document. The online version will have the latest version of the guide. If you do not have access to the Internet, you can access the version installed with the Comparator software.

LICENCE AND UPDATES

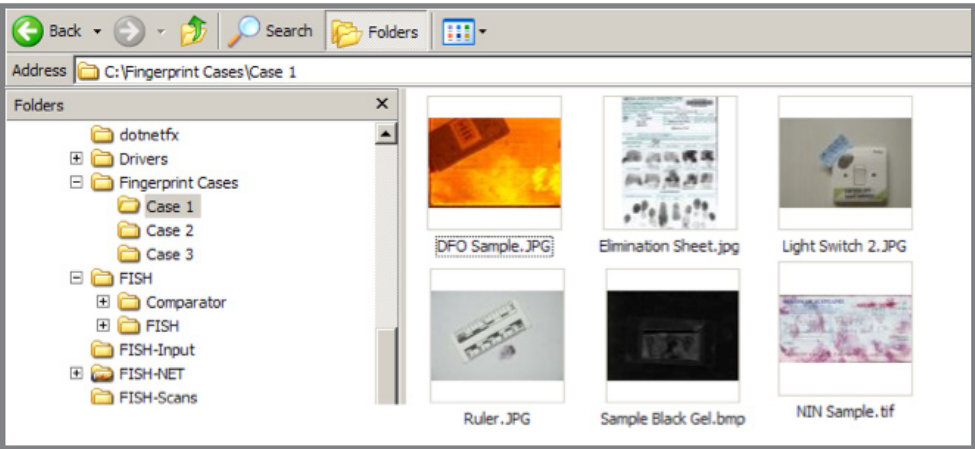
These buttons allow you to manage the licence for the software and to check for updates, located on the FISH website.



PREPARING IMAGES

PREPARING IMAGES

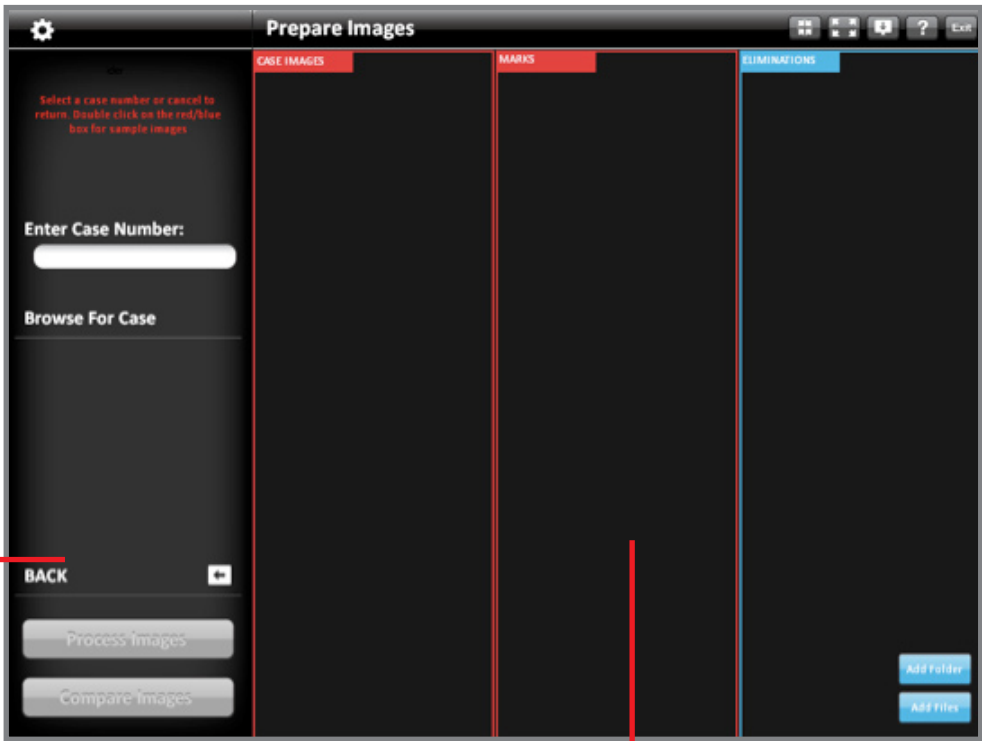
The Comparator uses the folder structure set up in your computer to manage the image files for comparison. The sample images, included in the Comparator, are stored in the structure shown below:



In this example, there are three folders (Case 1, 2 and 3) with a variety of image files in each folder. The Case 1 folder has some fingerprint images and an elimination sheet. The naming of folder and images is up to you and/or your organisations naming conventions.

WORKING AREAS

- The Comparator start-up panel has two main working areas:
- A left section, below the cogged wheel, for uploading files and folders as well as buttons to Process and Compare images
 - Three compartments, two with red headings and one with blue, manage Case Images, Marks and Eliminations



FILE MANAGEMENT

COMPARTMENTS

FINDING FOLDERS AND FILES

THERE ARE A NUMBER OF OPTIONS FOR LOADING IMAGE FILES AND FOLDERS:

If you want to upload a Case by using the folder name, enter the folder name by clicking the white box under "Enter Crime Number".

A data entry panel will appear.

Enter the folder details, using the numbers and letters using the keyboard the screen.

In this example, we have entered "CASE 1".

You can correct the data using the back button.

When you have finished press Enter.



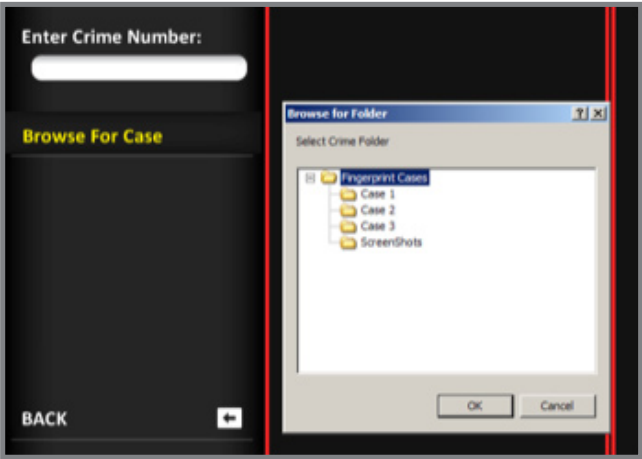
Once you have opened your Case, you can add additional images by scanning, pasting an image from the clipboard, or copying files and folders. Clicking on the functions under "Browse For Case" activates the different options for uploading image files or all of the files in specific folders.

You also have the option of clearing the Case and restarting the upload process.



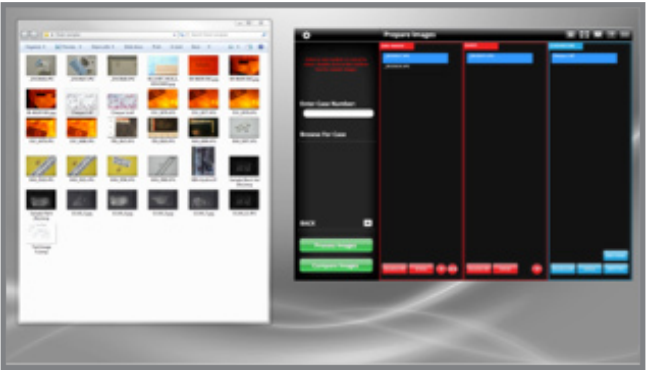
If you want to upload a Case from the folder list you are working with, click on "Browse for Case".

The folder list will appear in a browsing popup and you can select the folder you want to upload.



You can select image files, for example thumbnails, from an open folder and drag the images directly into the Comparator.

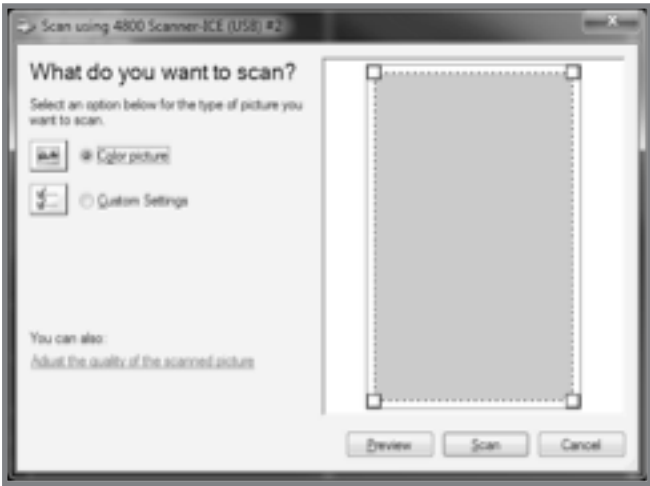
Using this method, it is quicker to move files and also to identify the images you want work on.



SCANNING / MANAGING IMAGES

SCANNING IMAGES

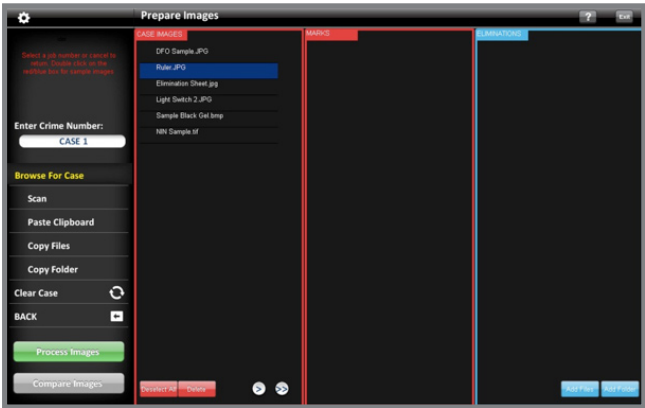
To scan an image into the Comparator, press the Scan button. The Scanner TWAIN driver panel will appear and you can select the area you want to scan. The scanned file will appear in the CASE IMAGES compartment.



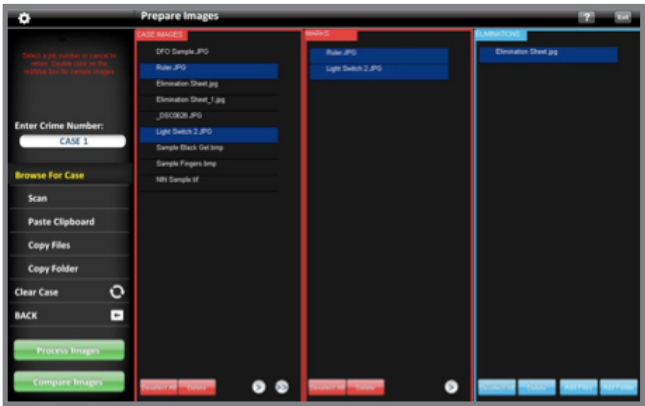
MANAGING IMAGES

This image shows the six image files from CASE 1 uploaded and they now appear in the CASE IMAGE compartment. One of the images has been highlighted (Ruler.JPG) and as a result, the “Process Images” button is now green allowing you to work with the image. If you highlight a number of the images, you can work with them one by one.

At the bottom of the compartment, there are icons that allow you to select and delete the image files as well as move the images to the other two compartments - MARKS and ELIMINATIONS.



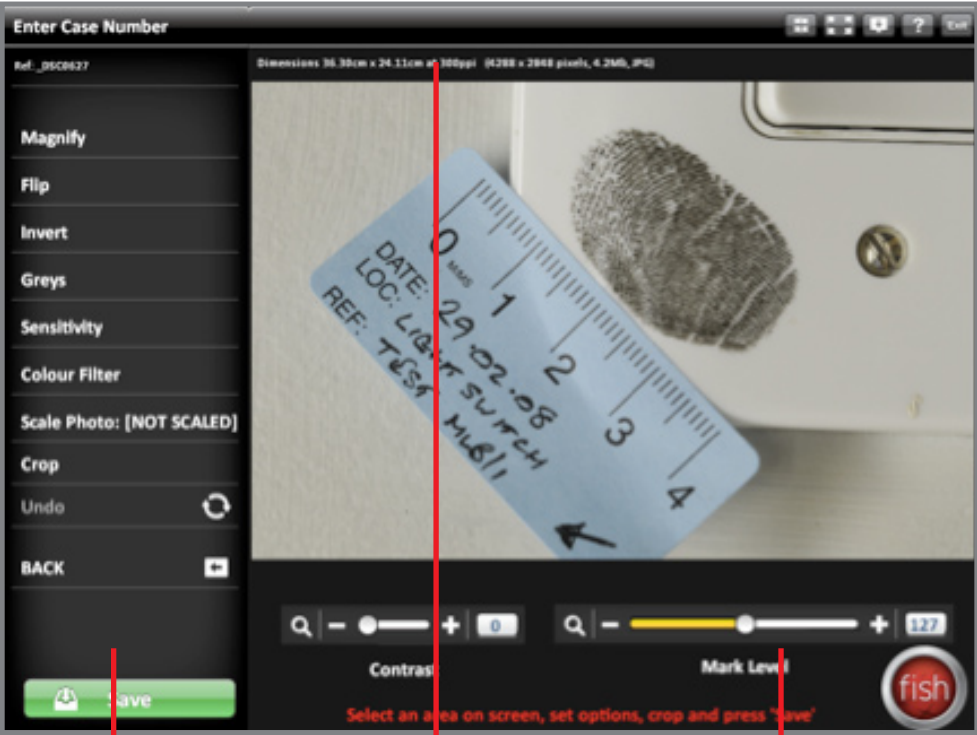
In this panel, two images have been copied to MARKS and the Eliminations Sheet has been copied to ELIMINATIONS. The “Compare Images” button is now green and you can compare images in MARKS with those in ELIMINATIONS.



USING THE COMPARATOR

PROCESSING IMAGES

WORKING WITH IMAGES



COMMAND PANEL

IMAGE ATTRIBUTES

SLIDERS ADJUST
CONTRAST & LEVEL

COMMAND PANEL



ACTIVATES THE MAGNIFYING GLASS

FLIPS THE IMAGE

INVERTS THE IMAGE

CHANGES BETWEEN GREY AND COLOUR

INCREASES THE CLARITY OF FAINT IMAGES

CHANGES THE COLOUR OPTIONS

ACTIVATES THE AUTOMATIC/MANUAL RULER.

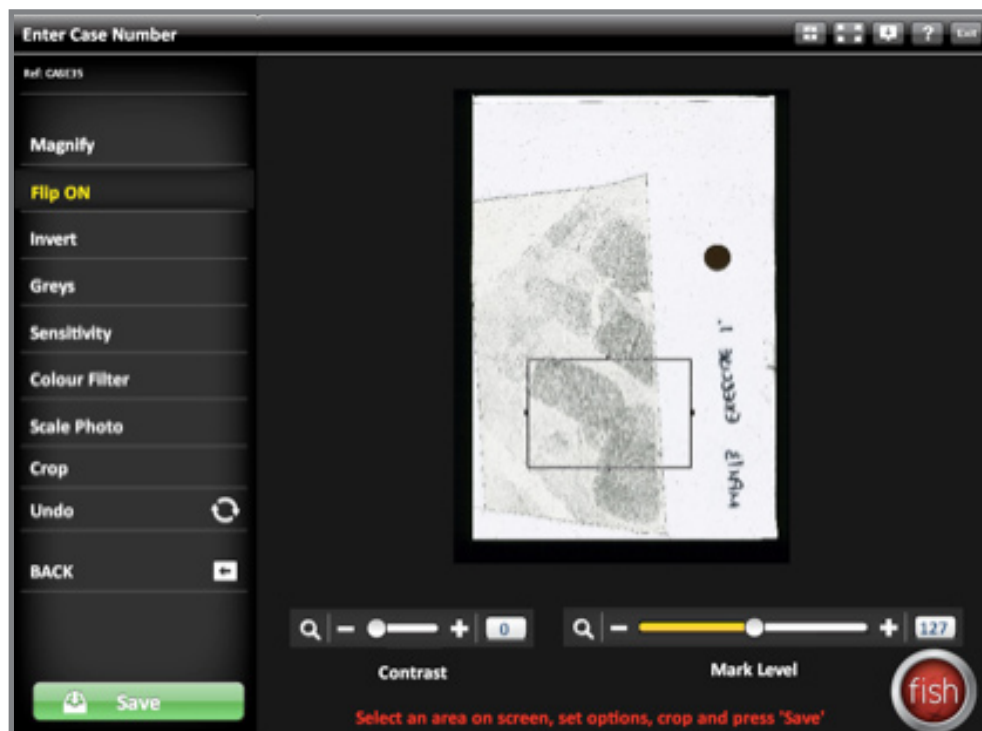
CROPS THE IMAGE

UNDO ANY EDITING

RETURN TO PREVIOUS PANEL

SAVES A NEW IMAGE WITH EDITS

WORKING WITH IMAGES

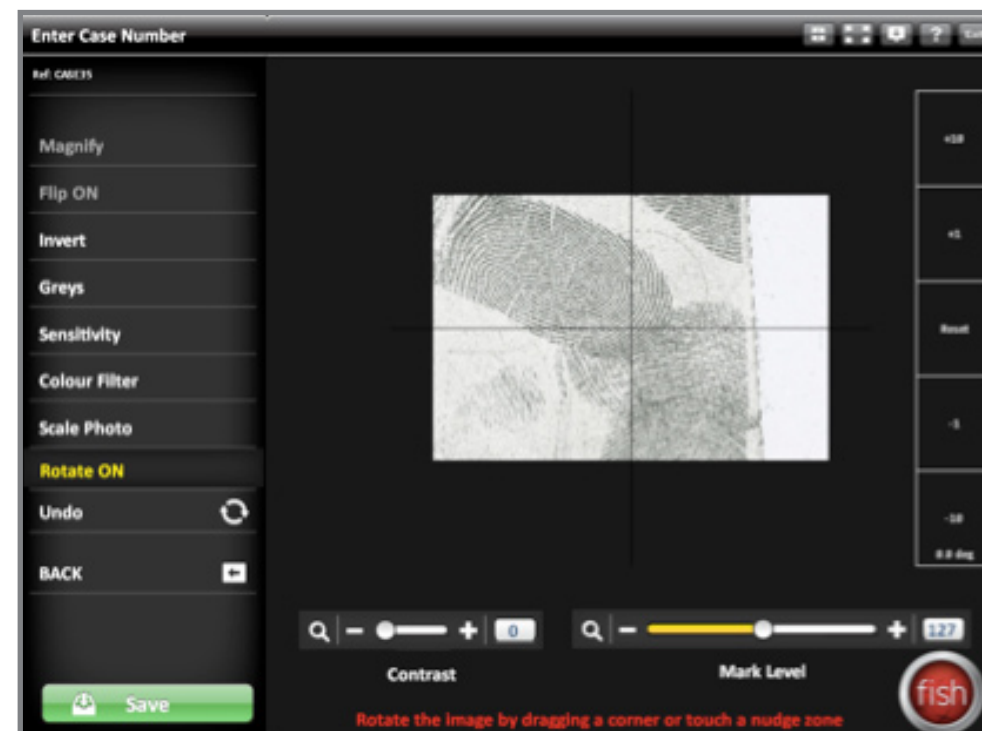


To zoom into an area of the image select an area with the mouse, hold down the left button and drag the cursor over the area required. This action draws a rectangular rubber band around the selected area. The image to the right shows an example of a boxed area drawn in the fingerprints.

To erase it just click the image outside of the box.

Edits can be applied to both the whole image and selected areas. Just drag a box around an area then apply contrast, invert or change the colour scan to grey scale. You can change an area by simply selecting the box and changing the settings.

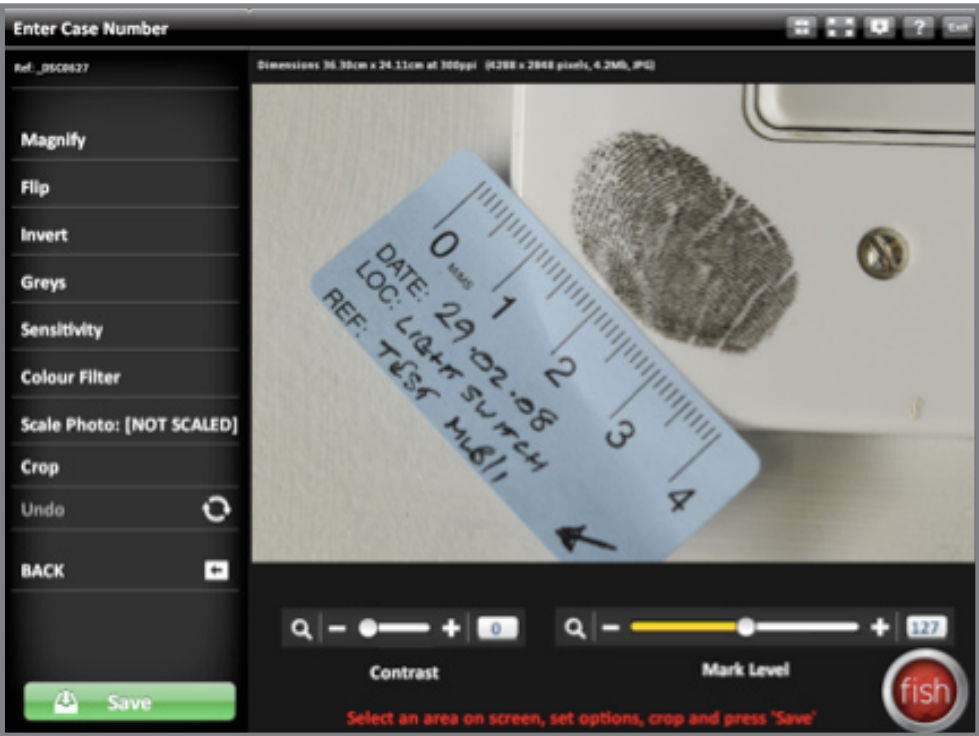
Be aware that although it will work with overlapping areas the results may not be what you expect as the edits are compounded. Please note that the edits within selected areas are not printed in the annotation.



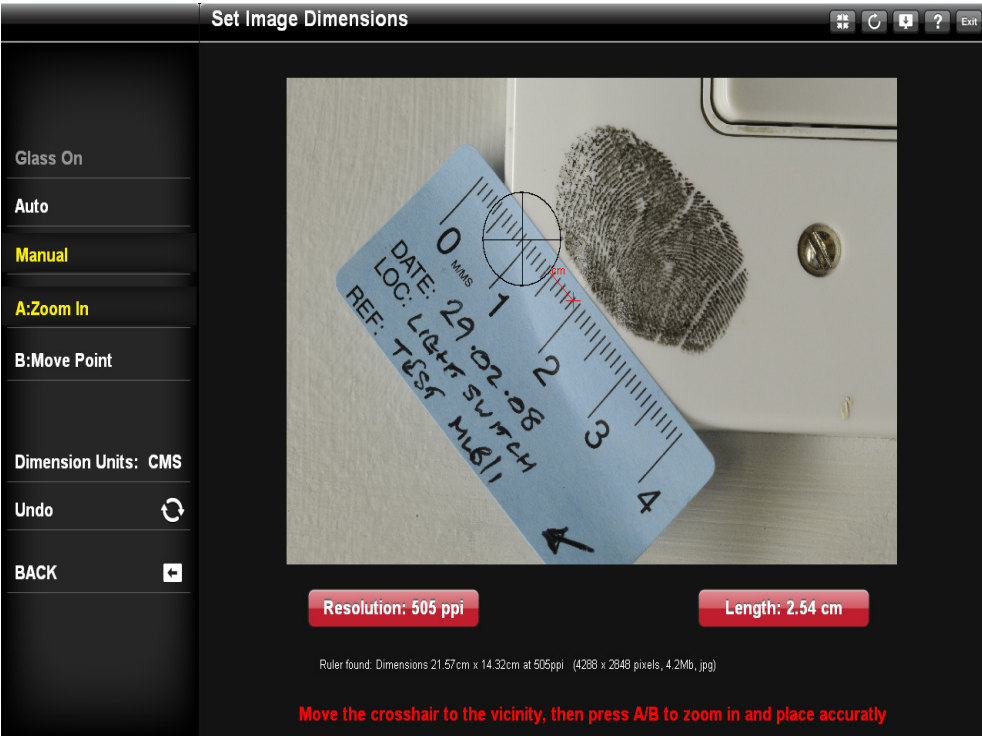
To select a free form area, press the 'Crop' button and then simply draw around the region of interest with the cursor. To crop and rotate a region of interest such as a mark, draw a box around the area, then press the 'Crop' button. The image to the right shows the boxed area selected for cropping. The mark can then be rotated by dragging / rotating the mark on screen left/right or by touching the 'Nudge Zone' which will rotate by increments of 1 or 10 degrees; this zone is to the right of the cropped image.

The "sensitivity" option is effectively a brightness function but configured for extreme values. It is specifically designed for teasing out a mark that only uses a few levels of greys. This can happen when the powder has not been picked up or low quality scanner are used.

SCALING IMAGES



An automatic scaling algorithm, embedded in the Comparator, scales the image; clicking on the Scale Image button activates this function. You can also manually adjust the scaling in the image, as shown in the Set Image Dimensions panel shown to the right. The red line drawn on the ruler shows the scale.



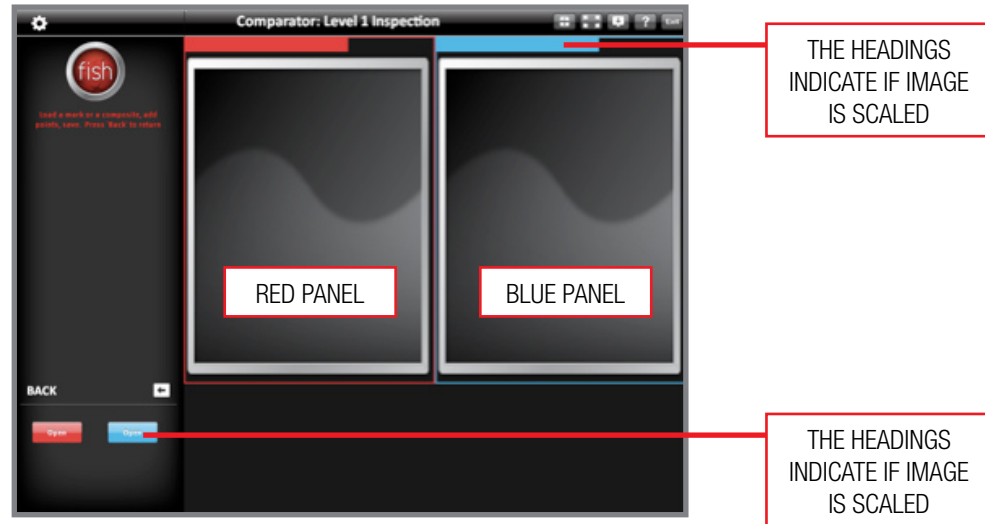
To activate the automatic scaling function, click Scale Photo and then click on the ruler in the image. If you want to adjust or set the image dimensions, click "Scale Photo" again.

The Set Image Dimensions panel manually adjusts the ruler by zooming in and moving the ends (A/B) of the ruler with the crosshairs, to the scale you want.

USING THE COMPARATOR

COMPARING IMAGES

At start up, the Compare Images screen shows two panels side by side. Image files can be dragged from their folder into the comparison panels or opened using the red and blue buttons to the bottom left of the screen.

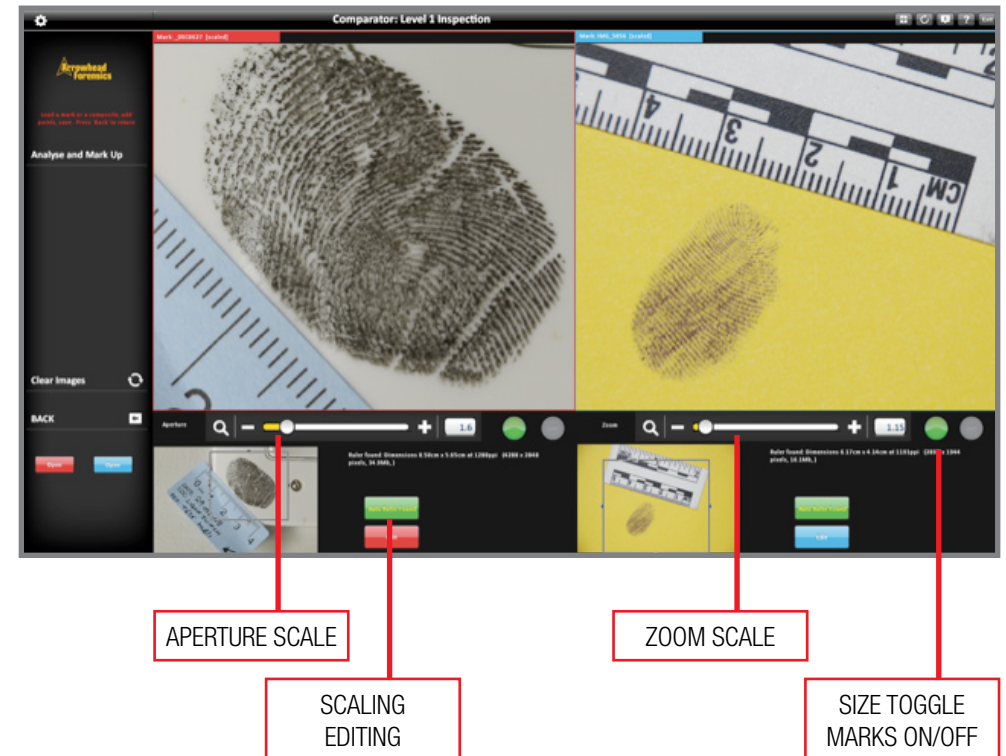


The images for comparison appear in the panels as well in a small panel below the slider bars. Once images are open in the panels, the aperture and zoom sliders appear as well as the square Scale and Edit buttons and two pairs of round buttons to the right of the sliders. The round green button toggles the image to its full size and its cropped size. The grey button turns the mark up marks on the image on and off.

The common approach once you have the opened the images is to:

1. Scale each photo – the mode button will change to green once this is done
2. Position the required mark on the screen by either changing the aperture size or zooming the mark
3. Rotating the mark using the mouse– this is done by moving the cursor left and right within the screen.
4. Analysing and Marking up the mark – once you enter this mode the editing function is disabled
5. Saving the final image, if require.

At start up, the Compare Images screen shows two panels side by side. Image files can be dragged from their folder into the comparison panels or opened using the red and blue buttons to the bottom left of the screen.



The sliders change the aperture size on both panels and magnify the images.

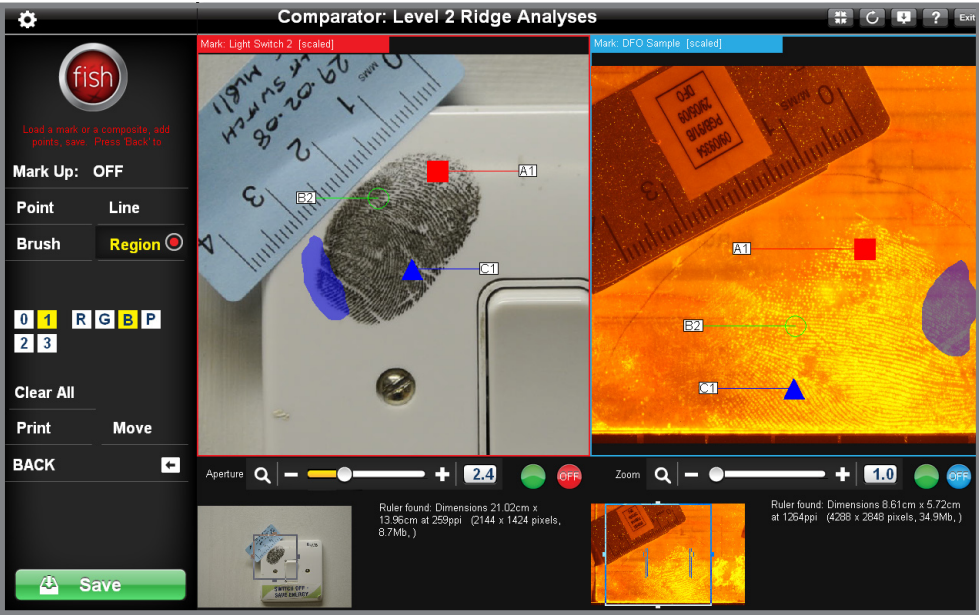
Please note that apertures do not appear in the small image panel until the images are scaled.

To scale the image, click the Scale button and then clicking the ruler in the image; this needs to be done for both images. The image below shows the both images scaled and apertures in the smaller panels. The scale buttons have turned green indicating that the images have been scaled.

Using the sliders, you can change the aperture size and zoom into the images. You can move the apertures in the small panels by clicking inside the aperture, holding down the left button and moving the mouse. The Edit button takes you to the Process Images screen were you can crop the image if you need a larger image.

LEVEL 2 INSPECTION

When you are ready to complete the Level 2 Inspection, you click on the words “Analyse and Markup”, the mark up buttons appear to the left of the images.



These buttons, described to the right, enable you to chart the comparison points between the two fingerprints. These points, displayed as a combination of filled or empty boxes and circles are in four colours red, green, blue and purple. The transparency of these shapes changes by clicking the boxed numbers – 0, 3, 6 or 9. Areas and regions are highlighted using the brush or region buttons.

COMMAND PANEL



TOGGLES THE MARK UP PANEL OFF AND ON

CHANGES THE STYLE OF MARK TO A POINT, A LINE DRAWN WITH THE CURSER, A BRUSH OR A REGION. THE REGION IS DRAWN WITH THE MOUSE.

CHANGES THE TYPE OF POINT – FILLED OR UNFILLED

THE NUMBERS CHANGE THE TRANSPARENCY OF THE POINTS, THE LETTERS CHANGE THE COLOUR AND THE TEXT BUTTON ENABLES TEXT ENTRY WITH THE MARKS.

CLEARs ALL OF THE MARKS OR DELETES SPECIFIC MARKS

PRINTS THE IMAGES. MOVES THE MARKS

RETURN TO PREVIOUS SCREEN IN THE COMPARATOR

SAVES THE IMAGES