

VSC ForeFront

Document Examination and Authentication System

User Manual



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Customer Support and Feedback

foster+freeman welcome feedback from Customers regarding this product. Please contact one of our offices if you would like to pass on your comments.

foster+freeman are pleased to offer advice, installation, training and on-site maintenance worldwide for all of their products.

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Specification

foster+freeman reserves the right to alter the specification of this product, accessories, and consumables without prior notice.

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Welcome

Welcome to the foster+freeman VSC® ForeFront user guide.



The VSC® ForeFront Mobile and ForeFront Desktop are standalone, field-ready forensic identity document examination systems for document imaging, e-Chip authentication and facial comparison.

About this manual

Please read this information before using the product for the first time.

Important information regarding the use of text, illustrations, safety and warnings within this manual.

Text

Text formats are used as follows:

- ⚠ Important operating information
- 💡 Additional notes and advice

Illustrations

Illustrations are for explanatory purposes only. The appearance of the product, its components, accessories, and consumables may differ from that shown.

Safety and Warning Markers

	Prohibited	Red markers prohibit certain actions or procedures. Disregard of these warnings may pose a health or safety risk to the user or cause damage to the equipment.
	Caution	Yellow markers warn of a hazard. The user should be aware of the associated risk and take appropriate precautions.
	Mandatory	Blue markers advise mandatory health and safety procedures, or other notable information. Disregard of the advice may increase an associated risk.

 **Before using the equipment for the first time, please read the safety information on the following pages.**

About this product

Please read this information before using the product for the first time.

Every effort has been made to ensure that the information presented in this document is correct at the time of writing. Foster+freeman reserve the right to make changes without prior notice.

Certificate of Conformity

A certificate of conformity for this product is available from foster+freeman Ltd.
This equipment is manufactured in conformity with the requirements of the relevant directives of the European Community through compliance with a number of harmonised standards.

Calibration and Adjustment

This equipment is correctly calibrated and adjusted at the time of manufacture.
Provided that the equipment is used in accordance with its operating instructions and is not maltreated, no further calibration or adjustment is required.

Safety Information

Please read this information before using the product for the first time.

In the event of a query, please contact customer support:
customersupportteam@fosterfreeman.com

General Safety



- Do not tamper with the device.



- Use the equipment only for the intended purpose.
- Use the equipment only in accordance with the operating instructions.
- Use only with equipment specified by foster+freeman.
- Do not use damaged equipment.
- Do not operate the equipment with any access cover removed.
- Do not remove any access covers.
- Access covers are only to be removed by trained individuals authorised by foster+freeman.
- Use only with spares, accessories or other consumables supplied by foster+freeman.
- Dispose of the equipment only in a responsible manner.



- Employ safe working practices.

Location



- Indoor use or in a vehicle* only.



- Do not operate the equipment outdoors.
- Position the equipment in a way that it can be easily disconnected if required.

Disposal



- Do not discard with normal commercial or domestic waste.



- Dispose of the equipment only where appropriate disposal or recycling facilities exist.



- Comply with all relevant legislation

This equipment falls within the scope of the European Directive 2002/96/EC on Waste Electrical & Electronic Equipment (WEEE)

Product Life Cycle Considerations

During the design and manufacture of our products, foster+freeman has considered the environmental aspects of its activities, products, and services that it can control or influence, with regard to the following:

- Electrical items - Waste Electrical and Electronic Equipment Regulations SI 2013/3113
- Wiring - Waste Electrical and Electronic Equipment Regulations SI 2013/3113

- PCBs - Directive 1996/59/EC (OJ:L243/31/96) on the disposal of PCBs and PCTs
- Metalwork - Scrap Metal Dealers Act 2013 Chapter 10
- Plastic - Waste (England and Wales) Regulations SI 2011/988
- Glass - Dispose of as household waste.
- Batteries - Waste Batteries and Accumulators Regulations SI 2009/890

The legislation listed is the disposal route for products / items in the UK, disposal in territories outside of the UK must be in accordance with the legislation of that country.

Electrical Safety



- This equipment must be earthed.



- Operate the equipment only from an appropriately rated electrical power source in accordance with the regulations of the country of use.
- Only use a suitably rated detachable mains cord for this equipment.
- If the device is powered via the vehicle's cigarette lighter socket for extended periods, it is recommended to use an auxiliary battery system or keep the engine running during operation to maintain the primary battery.
- Switch off when not required for use.
- Do not operate the equipment with damaged electrical connection cables.
- Do not operate the equipment without a reliable earthed connection.
- Do not replace any electrical spares.
- Do not operate this equipment with an incompatible mains electricity supply.
- The device contains a backup battery for a Real-Time Clock (RTC), which is not accessible without opening the housing of the scanner. Battery replacement must only be undertaken by trained service staff.



- VSC® ForeFront Desktop: Indoor use only
- VSC® ForeFront Mobile: Indoor or in a vehicle use only.

Mechanical Safety



- Do not drop.
- Take care, optical surfaces.

Optical Safety



- This product contains UV-A and IR light sources which are classified as CLASS 1M LED PRODUCT according to IEC 60825-1.
- Avoid looking directly at the light sources during operation.

Main Unit



Electrical Specification



- Do not connect this product with an incompatible mains supply.



- Electrical specification applies to the hardware only. The unit may be provided with a laptop or a desktop PC.
- The VSC® ForeFront Mobile may be powered by either mains electricity or from a 12V or 24V vehicle cigarette lighter port using an adaptor.
- The VSC® ForeFront Desktop is powered via mains electricity.

Mechanical Specification

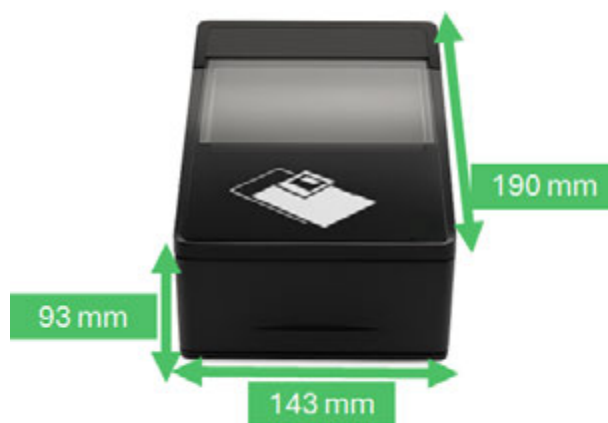
VSC® ForeFront Mobile



* Including case, 16" laptop, power supply, webcam and scanner. Excluding car charger.

** Dimensions are applicable to the closed case.

VSC® ForeFront Desktop (Scanner)



Environmental Specification



- Indoor or in a vehicle use only.



- Maintain adequate ventilation.

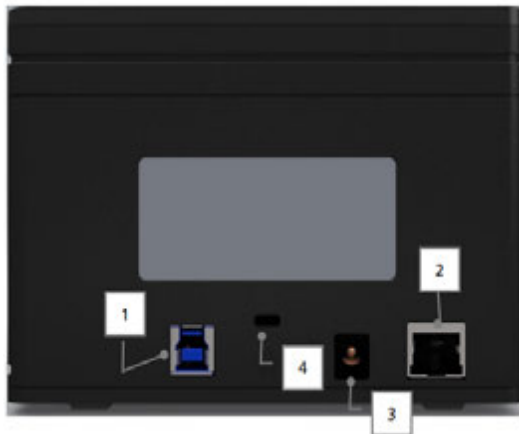
Environmental specification	
Location	Indoor use or in vehicle use only
Altitude	2000m (Maximum)
Ambient temperature (°C)	0 - 35
Storage temperature (°C)	-10 - 60
Ambient humidity (RH%)	20 - 80% RH (non-condensing), for temperatures up to 31°C, decreasing linearly to 50% RH for temperatures at 40°C
Pollution degree of the intended environment	Pollution Degree 2

Optical Specification

The VSC® ForeFront contains an array of different light sources, including white, UV-A and Infrared for the interrogation of identity and travel documents.

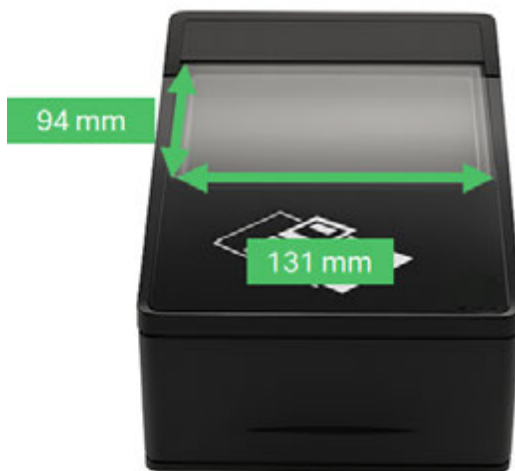
Scanner Specification

The document scanner used for the VSC® ForeFront supports ID1, ID2 and ID3 document formats.



1	USB Host	USB-B 3.0
2*	LAN	RJ45
3*	Power connector	11V DC - 28V DC, MAX13W ⊖ ⊕ (5,5mm / 2,5mm)
4	Kensington lock	

*Sockets optional depending on specification of unit.



Document scan area supports ID cards and full-page passport with a 900 dpi image resolution.

Light sources include:

- White
- IR
- UV
- Coaxial (white)
- Oblique (white)

With automated document-triggered scanning, auto-crop and rotate, background removal and document size recognition fed into the VSC® ForeFront software.

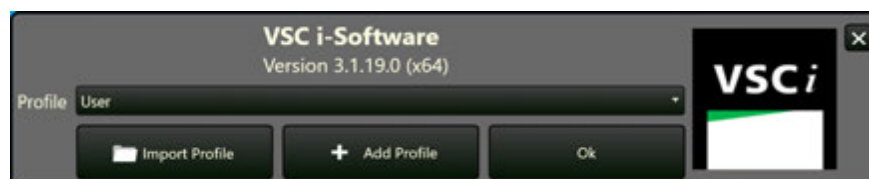
User Guide

The VSC® software is icon-driven and contains different functions and the ability to customise and semi-automate the document examination process.

Identity documents that are placed on the ForeFront scanner will be imaged, the e-Chip will be read if present, and all resulting information will open within the VSCi software.

Selecting a User

When the VSC® software has started, a window will open, prompting for the selection of a user.



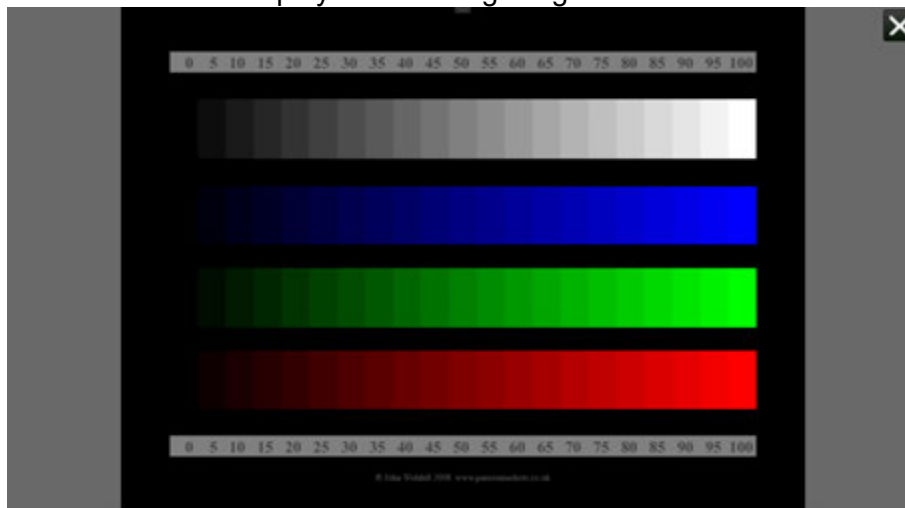
- Use the drop-down menu to select an existing user profile.
- Import a profile from existing VSC® software.
- Add a profile.
 - This will open a dialog box for the creation of a new user profile. Once created, select add profile.



Select the required user profile and select "Ok" to enter the main software.

Colour Chart

Selecting the colour chart icon will display the following image:



Adjust any monitor settings as required.

Gallery Menu Overview



1. Stored images.
2. Save current image to the gallery.
3. Save current image to a specified location.
4. Import images to gallery.
5. Search images.
6. Remove images from gallery.
7. Save options.

Stored Images

Images that have been taken and stored in the VSC[®] software are accessible from the gallery menu. A scroll bar will allow for the user to scroll right or left to view more thumbnail images.

- Click on an image to select it. Selected images will have a yellow border.
- Double click an image to open it into the main image viewer.

Save Current Image to the Gallery



- Selecting this icon will add an image from the live viewer to the gallery.
- Selecting this icon will also add a copy of an image from the live viewer to the gallery where a saved image has been opened for editing or annotating.

Save Current Image to Specified Location



- Save the current image directly to a location specified in the settings. See: ["App Settings"](#) on page 35

Import Images into Gallery



- Selecting this icon will open a window for other images saved on storage devices to be selected and imported into the gallery.

Search Images



- Selecting this icon will allow for the filtering of images in the gallery based on light source or filter used.

Remove Images from Gallery

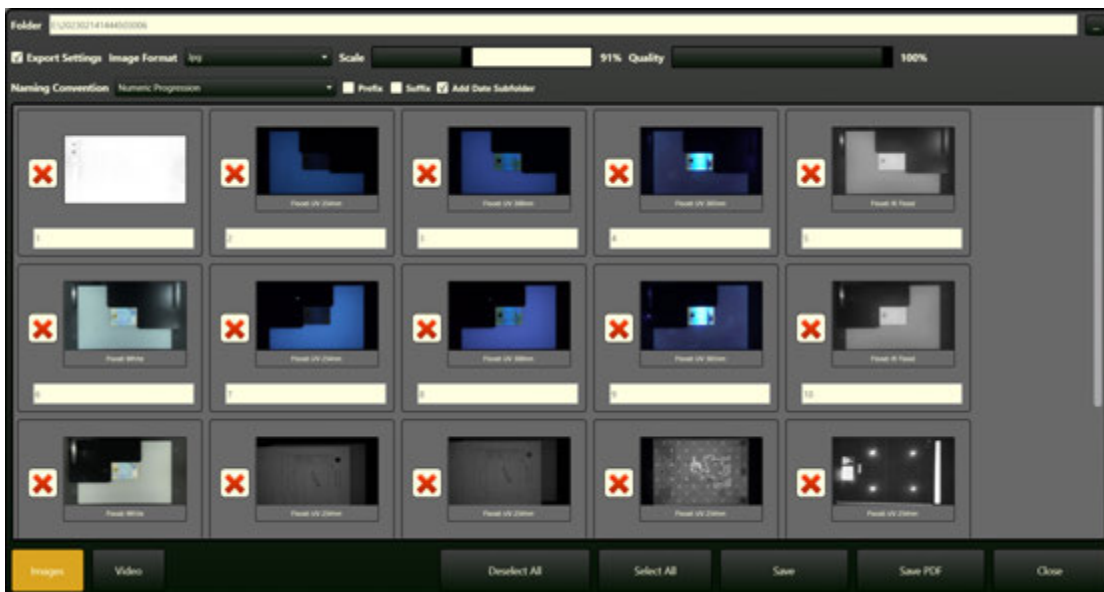


- Selecting this icon will open a separate window where images can be selected and removed.

Save Options



- Selecting this icon will open the save options, allowing for the save location of taken images to be determined.



Features Menu Overview



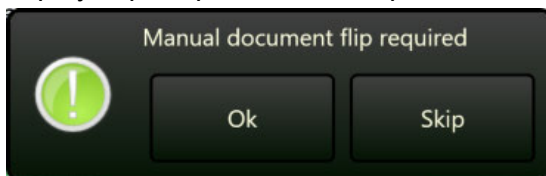
Select the relevant icon to launch the relevant feature. Some features are available in a sub-menu.

1. STAC
2. Barcodes
3. IPI (Invisible personal information)
4. Latent image
5. Annotations
6. Compare
7. Databases
 - User (default)
 - Documents (if licenced)
 - Currency (optional, if licenced)
8. Advanced Tools
 - Background Removal
 - Face Matching
 - Cropping
 - MIC / CPS
 - Pseudo Colour
9. Config
 - App Settings
 - Calibrate Measurement
10. Image Settings
11. Text
12. Notes

Scan a Document

When the software and scanner are both ready, present an identity document to be read. Once a document read is progressing, please do not move or remove the document unless prompted.

If scanning an identity card, all images will be obtained from the front of the document and a pop-up will display to prompt the user to flip the document so that images can be obtained from the back.



Place the document upside-down on the scanner so the back can be imaged, and then select "Ok".

Select "Skip" to open the IDAnalyze Verification tab without taking images of the rear of the document.

The software will perform validation checks and open onto the IDAnalyze Verification page displayed within the STAC feature.

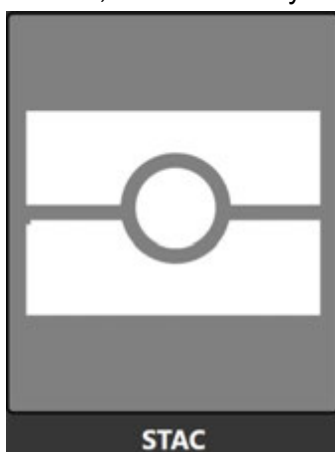
Please note: Images are not automatically saved. If a document requires further inspection using additional features such as IPI, ensure images are saved before navigating away from the STAC screen.

Green	No errors detected.
Amber	Further inspection required.
Red	Errors detected.

Select each icon to inspect the feature further, or alternatively select the required tab above these icons.



Select to view the ID Analyze results page.



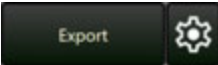
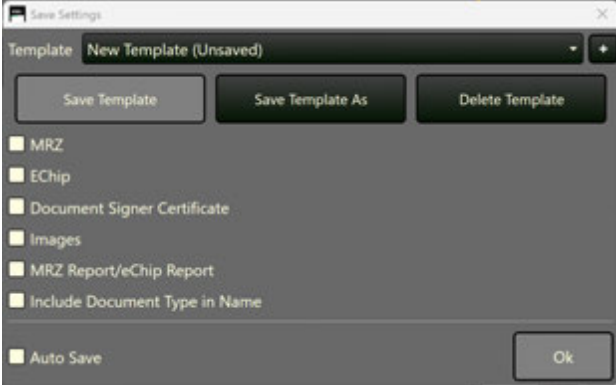
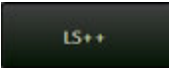
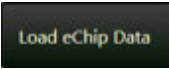
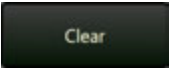
Select to view the STAC results page.



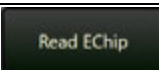
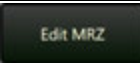
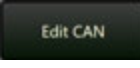
Select to view the face matching results page.

Additional controls:

	Add all captured images to the image gallery within the VSC® ForeFront software. Please do not navigate away from this page until the save is complete and the following pop-up displays:
	Retry reading the e-Chip with the scanner.
	Retry the IDAnalyse step.
	Capture images of additional document pages with the scanner.
	Visible ☒ Ultraviolet ☒ Infrared ☒ Coaxial ☒ OVD ☒ Auto Capture ☒ Select the light sources that are used during image capture. Select auto capture for images to be captured when a document is placed on the scanner.

	Export a .zip file of all checked components, including pass / fail results for each. Use the settings controls next to the export button to determine what information is included in the export.  Use the pop-up window to select which results should be saved when exporting. Select "Save Template As" to save the selected options. When a template is selected, it will remain active until changed. The selected save options will apply each time the export option is selected.
	Open LetterScreen++ controls.
	Select to load e-Chip data in a *.ff file for comparison with the optical and expected data.
	Select to clear the data, ready for a new document.

If an e-Chip is not successfully read, or not present, an additional option will display and the e-Chip tab will be hidden:

	Select to attempt to read the e-Chip again. Depending on the location of the e-Chip within the document, a different area of the document may need to be presented to the scanner.
	Manually edit the MRZ number, test the check digit and save. 
	Manually edit the CAN number, test and save.

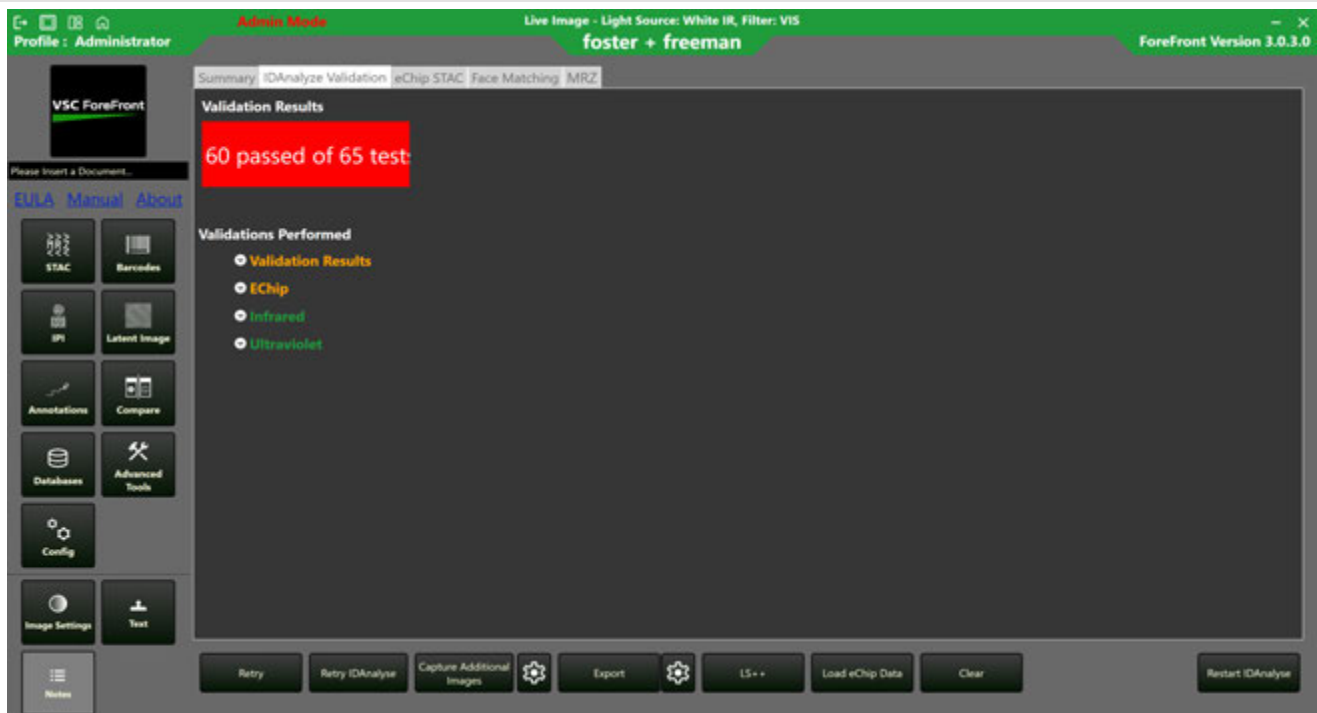
IDAnalyze

This tab will display the overall validation results including the number of passed tests, the number of tests performed, and the background colour denotes a pass / fail result.

A green background indicates a validation pass, and a red background indicates a validation fail.

Expand the drop down menus to view all of the relevant ID Analyze data. This will include an expandable list of validations that were performed as part of the ID Analyze step using integrated third-party software provided by DESKO for the physical document features and for the eChip.

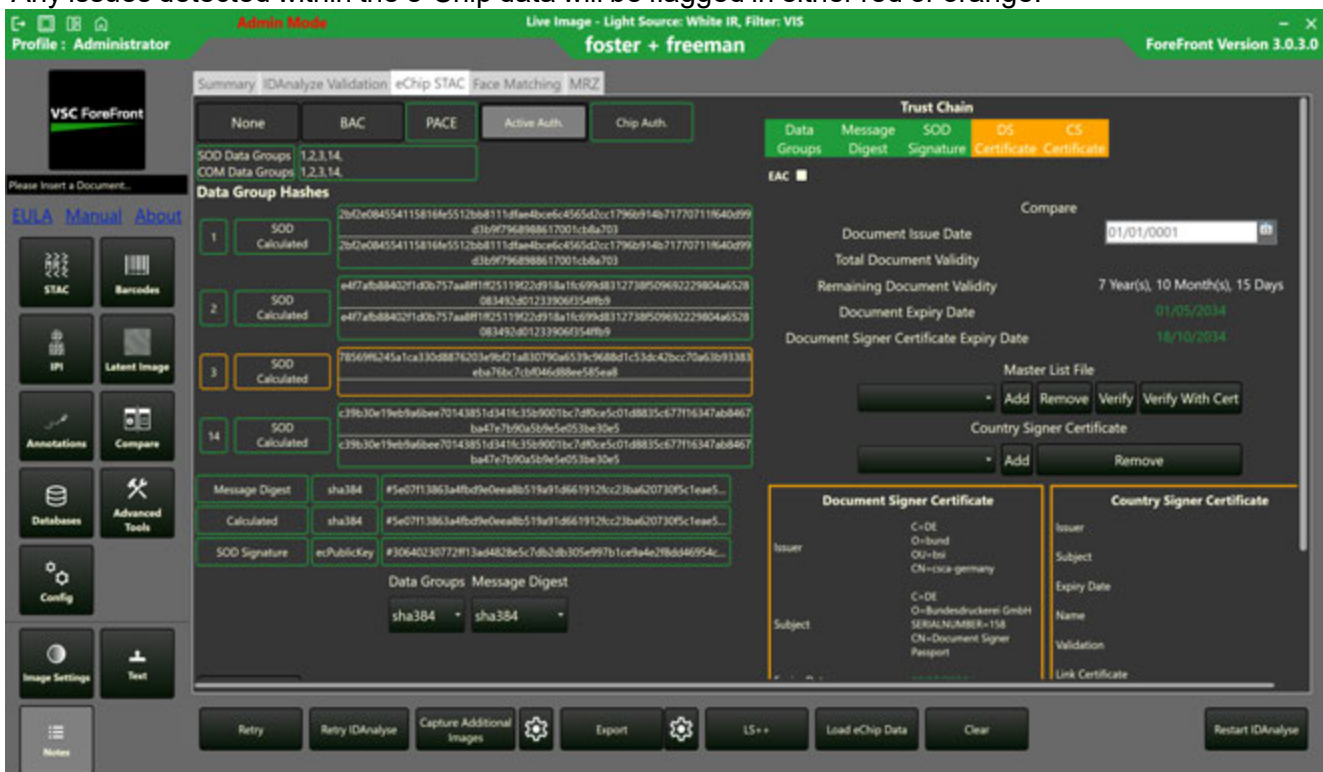
If validation fails, further inspection of the document will be required.

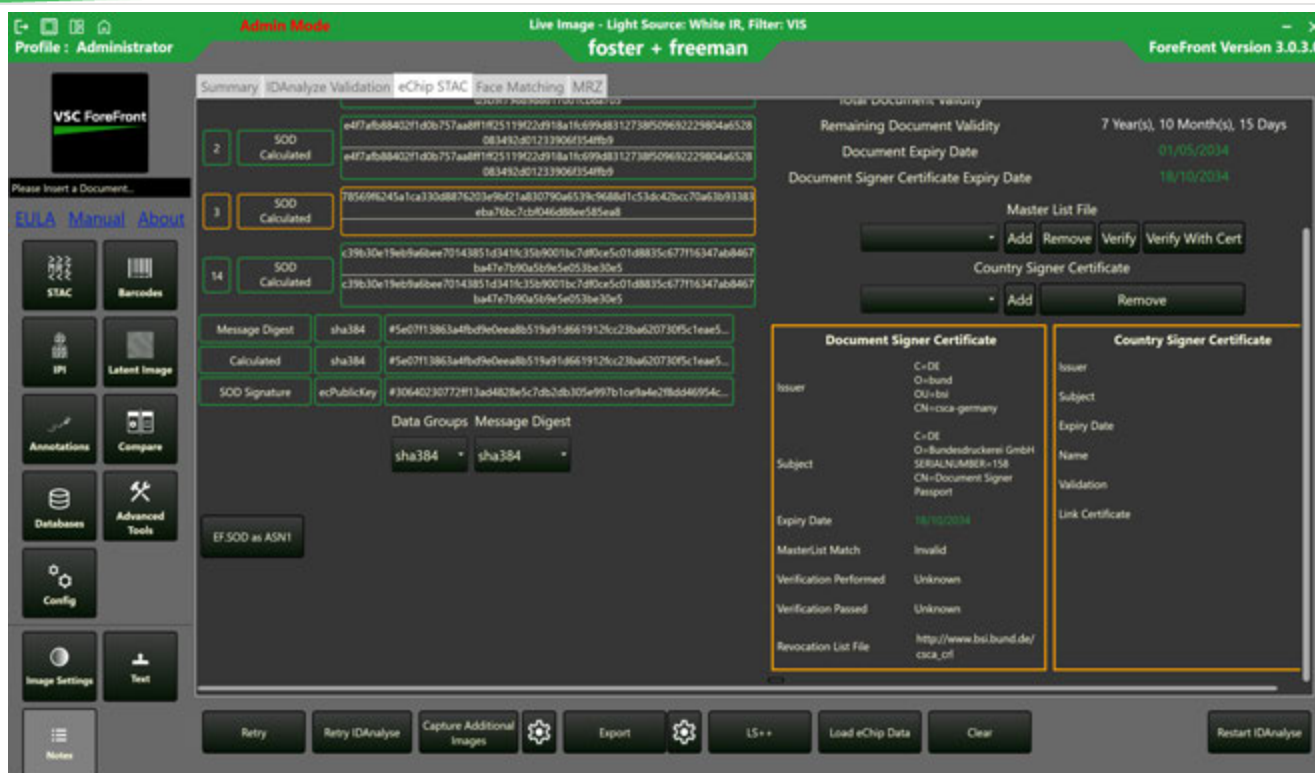


e-Chip STAC Tab

If a document contains an e-Chip, this can be read by the VSC® ForeFront and the information will be displayed alongside that of the optical information.

Any issues detected within the e-Chip data will be flagged in either red or orange.



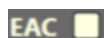


The Trust Chain is used to quickly identify errors that the STAC software has identified within the e-Chip data. Each section of the Trust Chain summary will indicate a level of trust using the following colours:

Green	No errors detected.
Amber	Further inspection required.
Red	Errors detected.

Trust Chain summary sections:

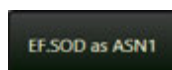
Data Groups	Verification that the calculated hash values align with those stored in the SOD file on the chip.
Message Digest	Verification that the re-calculated hash of the SOD hash table aligns with the MD within the SOD.
SOD Signature	Verification of the successful decryption of the SOD signature with the DSC, and the result matches the expected result (the original MD).
Document Signer Certificate	Verification of the DSC using the associated CSC.
Country Signer Certificate	Verification that the CSC has been obtained from a trustworthy source.



EAC tick box

By default, this is unticked.

Select this tick box to allow for the inclusion of the results from Data Groups "DG3" and "DG4" in the Trust Chain summary.



Show the EF.SOD file from the e-Chip data in ASN1 format.

Please note: The procedures used in the STAC software adhere to the guidelines listed in ICAO document 9303. Any documents that do not comply with ICAO recommendations, regardless of authenticity, may be flagged in the software.

Please see the standalone VSCi STAC document for more in-depth detail.

Face Matching

When a document is read using the ForeFront scanner, the images are automatically loaded into the face matching software.

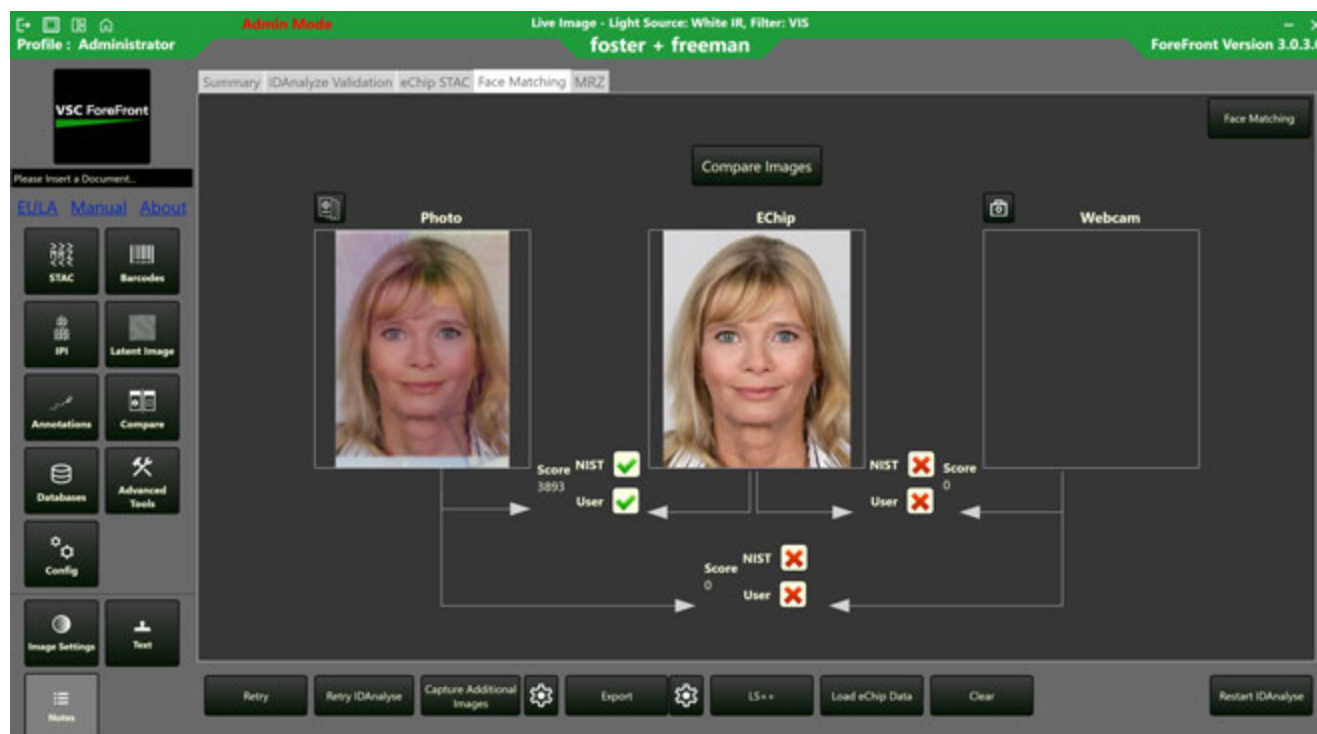
Images will be automatically populated when the document has been read, however these can also be manually selected using the process outlined below.



A green tick denotes a successful match.



A red cross denotes no match.



1. Open the LFIS face matching software.



2. Select this icon to upload up to 3 stored images for face matching.



3. Select this icon to upload an image from a connected web cam.
4. A match or mismatch will be demonstrated with a green tick or red cross, along with a measure of confidence in the match denoted as a percentage.
5. Select save to open a new window to determine a save location for a brief report containing all image comparisons and results.
6. Select save PDF to open a new window to determine a save location for a full PDF report, with company logos, containing all image comparisons and results.

MRZ (Machine Readable Zones)

The Machine Readable Zone (MRZ) can be located either at the bottom of a document (TD3) or located on the back (TD1) and can be two or three lines of data for TD3 or TD1 documents respectively. The MRZ is assigned to the category "optical". The check digit, calculated from the MRZ data, is compared to the e-Chip data.

The check digit will be displayed with a coloured border depending on the check digit result.

- If a cell in the table is bordered green, the check digit passes.
- If a cell in the table is bordered orange, further verification is required using the e-Chip.
- If a cell in the table is bordered red, the check digit has failed.

Optical Comparison Table:

	Optical	eChip	Expected
Document Number	8	8	8
Date of Birth	6	6	6
Expiry Date	9	9	9
Personal Number	1	1	1
Composite	8	8	8

MRZ Data Comparison:

Field	Optical	eChip
Document Number	C26327YC	C26327YC
Document Type	Passport	Passport
Document Sub Type	-	-
Expiry Date	01/05/2014	01/05/2014
Issuer	Germany (DEU)	Germany (DEU)
Date of Birth	12/06/1983	12/06/1983
Age	42	42
Gender	Female	Female
Names	MUSTERMANN ERIKA	MUSTERMANN ERIKA
Nationality	Germany (DEU)	Germany (DEU)
Personal Number	2405-1111111111	2405-1111111111
ICAO Type	TD3	TD3
Corrected MRZ	P<DE<MUSTERMANN<ERIKA<12061983<2405111111111111<18	P<DE<MUSTERMANN<ERIKA<12061983<2405111111111111<18
MRZ Image	[MRZ Image]	

Barcodes

1. Click and drag from the top-left to the bottom-right of the barcode. A red box should surround the barcode.
2. Select Scan, located on the right working pane, to read the barcode.
3. Barcode information will display in the right-hand working pane.
4. The barcode and information can be saved by selecting Save or Save PDF.

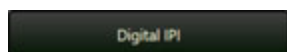
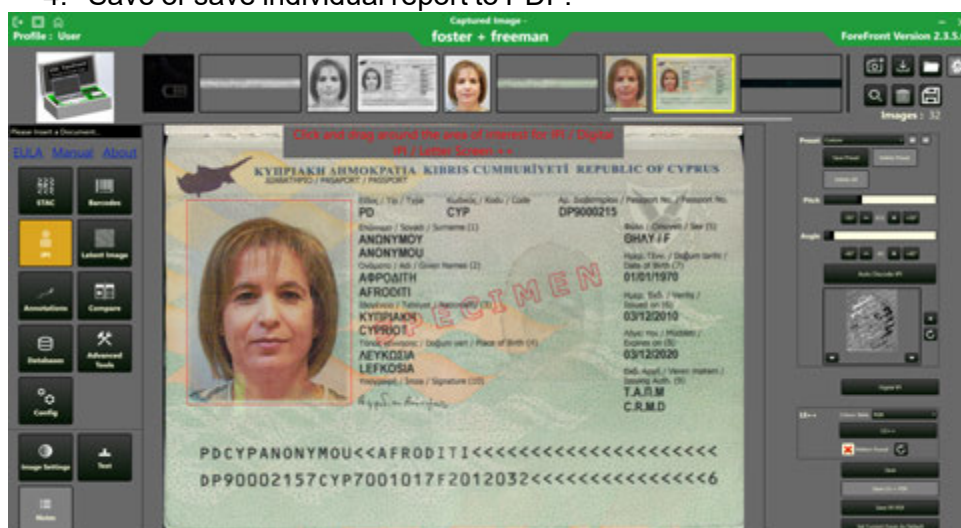


IPI (Invisible Personal Information)

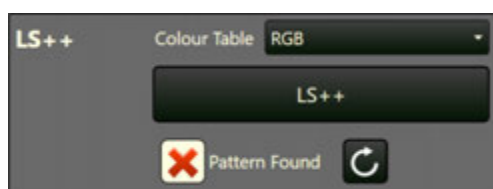


IPI is used to decode Invisible Personal Information, or Scrambled Indicia, usually used within passport images and identity cards.

1. Click and drag from top-left to bottom-right of the feature. A red rectangle will appear on screen surrounding the image.
 - Ensure the image is fully inside the red border.
2. A preset can be selected from the drop-down menu on the right side.
 - Presets may be added, amended or removed using the relevant buttons.
3. Either use the auto decode IPI function, or manually adjust the pitch and the angle in the software using the +/- or click and drag on the sliding bar until the information is clear.
 - The decoded IPI will be visible using the control area on the right.
4. Save or save individual report to PDF.



Digital IPI can also be decoded using the IPI feature. If an identity document contains Digital IPI, select Digital IPI from the controls. The IPI and decoded two-dimensional barcode information will display on the right.



LS++ controls are also available within this window. Select the LS++ button to automatically detect the presence of a LetterScreen++ pattern.

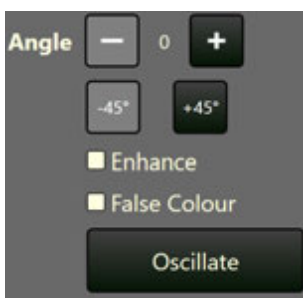
A green tick will display if a LS++ pattern is detected, or a red cross if it is not.

Latent Image



This is an image enhancement technique that can reveal hidden images in some documentation. This can apply a false colour and the angle can be changed or oscillated to better view the latent image.

If oscillation is enabled, the software will cycle through different angles, allowing a document examiner to better visualize a latent image.



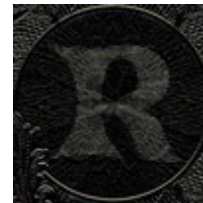
Without latent image viewer:



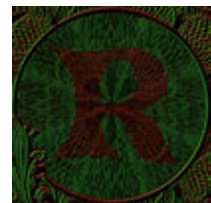
With latent image viewer:



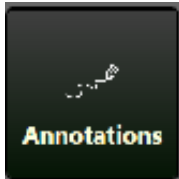
Enhanced:



Enhanced and False Colour:



Annotations



When an image from the gallery is open in the main image viewer, the annotations icon is available.

- When selected, a floating window opens over the right of the image and allows for the addition of shapes, highlighting and text to be added to an image.



Shapes and arrows can be overlaid onto captured images to identify areas of interest within a document. These shapes can be coloured, moved and resized. Text can be added to provide further information to the images.

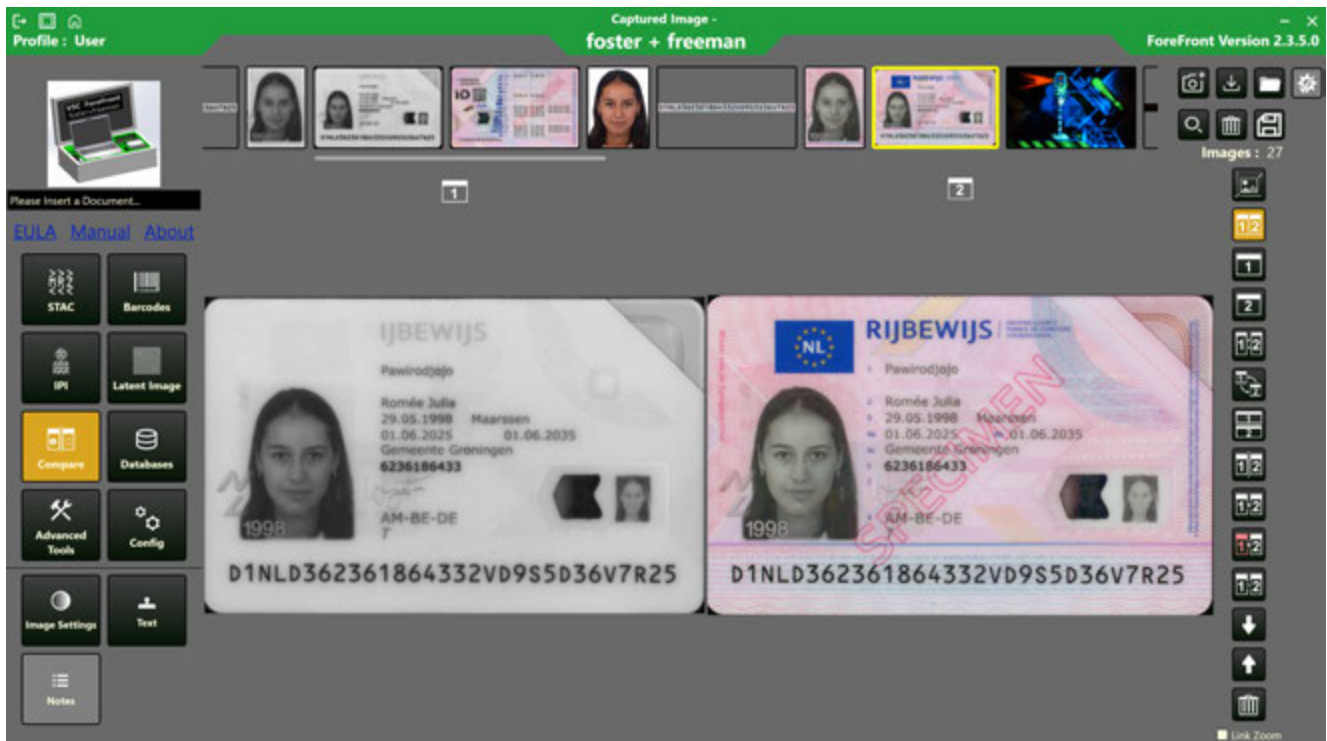
Other controls include undo, redo, remove, delete, send to front, send to back, and save. These controls can be applied to any annotation once selected.

Measurements can also be applied to an image by selecting one of the measurement icons.

Compare



Compare is used to determine similarities and differences between two images. Two images from the gallery can be opened and compared side by side.



Control icons (right)



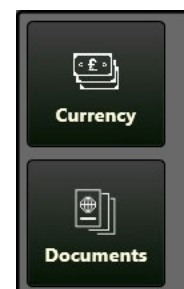
1. Automatically identify differences in orientation and scale, then adjust the position of Image 1 to align with Image 2.
2. Images 1 and 2 will be displayed side-by-side.
3. View image 1.
4. View image 2.
5. Strobe: Alternate between viewing Image 1 and Image 2, displaying each for a few seconds.
6. Flip: Swap the positions of Image 1 and 2.
7. Horizontal split: both images are opened into the same viewing window and a split bar can be moved up or down to view more or less of one image.
8. Vertical split: both images are opened into the same viewing window and a split bar can be moved left or right to view more or less of one image.
9. Overlay: overlay images 1 and 2.
 - Transparency of images can be controlled using the click and drag bar at the bottom of the screen when in overlay mode.
10. Overlay with false colour: overlay images 1 and 2, with a magenta wash being applied to image 2.
 - Transparency of images can be controlled using the click and drag bar at the bottom of the screen when in overlay mode.
11. Overlay with colour inversion: overlay images 1 and 2, with image 2 being inverted and added to image 1.
 - Transparency of images can be controlled using the click and drag bar at the bottom of the screen when in overlay mode.
12. Compares each pixel and takes the lowest value.
13. Compares each pixel and takes the highest value.
14. Delete: remove the contents from images panes 1 and 2.
15. Link Zoom: Synchronise Images 1 and 2 so that magnifying one image automatically magnifies the other by the same amount.

Databases



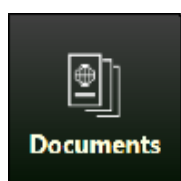
Select to view the sub-menu containing the Currency and Documents features.

Select the relevant database to launch that feature.



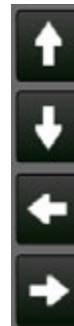
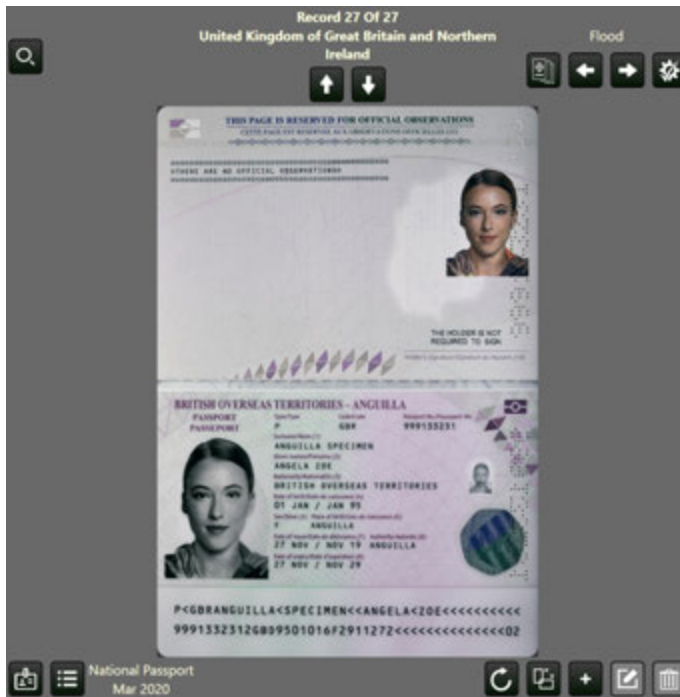
Documents

The documents and / or currency databases will be visible if they are licenced. There is a user-created database available with the same controls detailed below.



Compare identity documents under different lighting conditions to a database provided by Keesing® to determine authenticity.

Once documents is selected, the screen will be divided in two. The live (or stored) image being examined will be open on the left and the database with database controls will be open on the right. The document type and location being displayed is noted above the database image.



- Directional arrows are used to navigate the database and view different documents.
 - The up and down arrows will navigate between different database entries.
 - The left and right arrows will scroll through images stored within an entry.
- Select different lighting conditions for the front of the document.
 - Flood Front.
 - IR Flood Front.
 - UV Flood Front.
- Options include:
 - Flood Front.
 - IR Flood Front.
 - UV Flood Front.
- Rotate image clockwise 90°.



- Search document by issuer, type, e-Chip, single or double sided, country of origin, and date of circulation.
- Select relevant details from the drop-down lists provided.

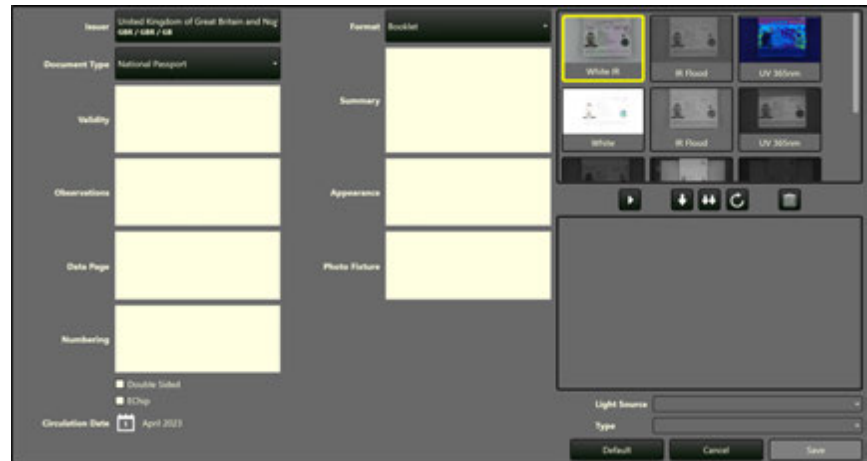
Issuer: All
 Document Type: All
 EChip: All
 Double Sided: All
 Origin: All
☐ Circulation Date: 1 January 2000
 Search



Issuer
Aruba
Document Type
Visa
Circulation Date
January 2010
Summary
Visa
Validity
Varies, Entry 'Until'
Appearance
C, 105 X 74 Mm / 4.1 X 2.9 In.
Data Page
None
Photo Fixture
Integrated
Numbering
7 Digits, Preceded By 'KNC'
Observations
This Visa Was First Issued In 2010
Format
Sticker

- Lists the information for the document being displayed by the database.

- Add stored image to a custom database.
- Select the stored image or images to be added to the custom database.
- Select the down arrow and complete details as required.



- Apply image settings used within the database to the live image in the right-hand pane.



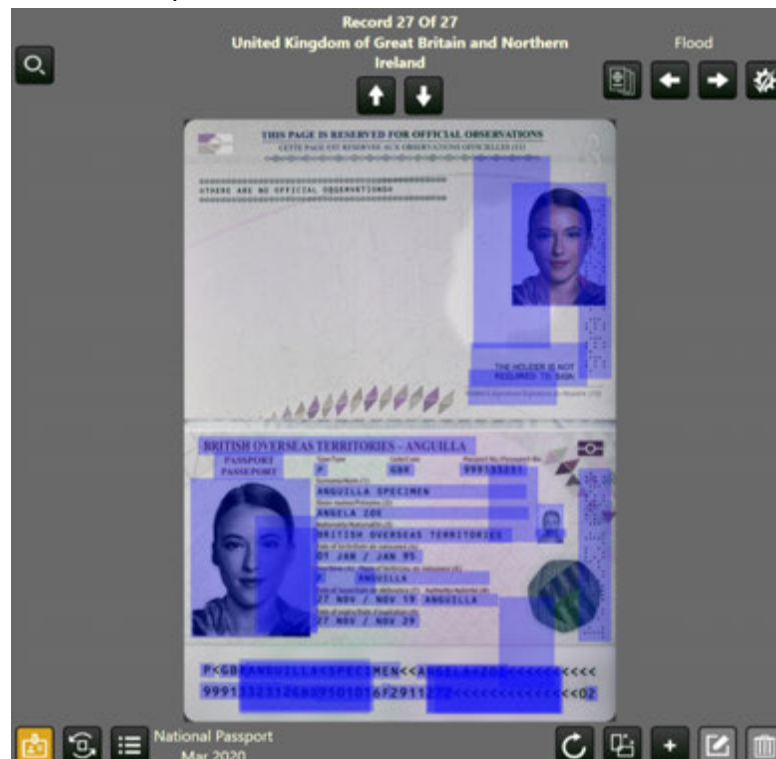
- Edit the details of an item within the custom database.



- Remove selected item from the custom database.

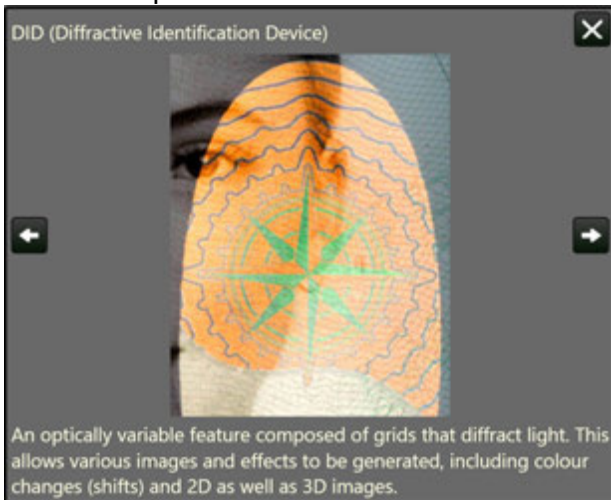
Regions of Interest

Regions of interest (ROI) function will highlight areas for further examination. This will highlight security feature locations or personalised components.



Select a security feature to view additional images demonstrating this feature with a brief description.

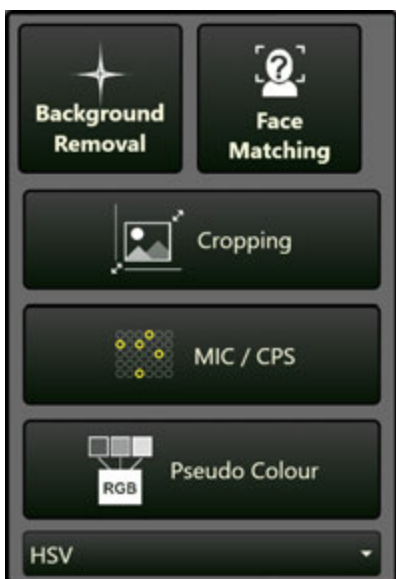
Overlapping regions of interest: Right-click with mouse, or long-press on the touch screen, and select the relevant ROI from the drop-down menu.



**Advanced
Tools**

Select Background Removal or Face Matching to launch the relevant feature.

- "Background Removal" on the next page
- "Face Matching" on page 22



Open image cropping.



Cropping

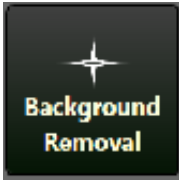
Machine Identification Code / Counterfeit Protection System will exaggerate the yellow tracking dots on printed items.

MIC / CPS

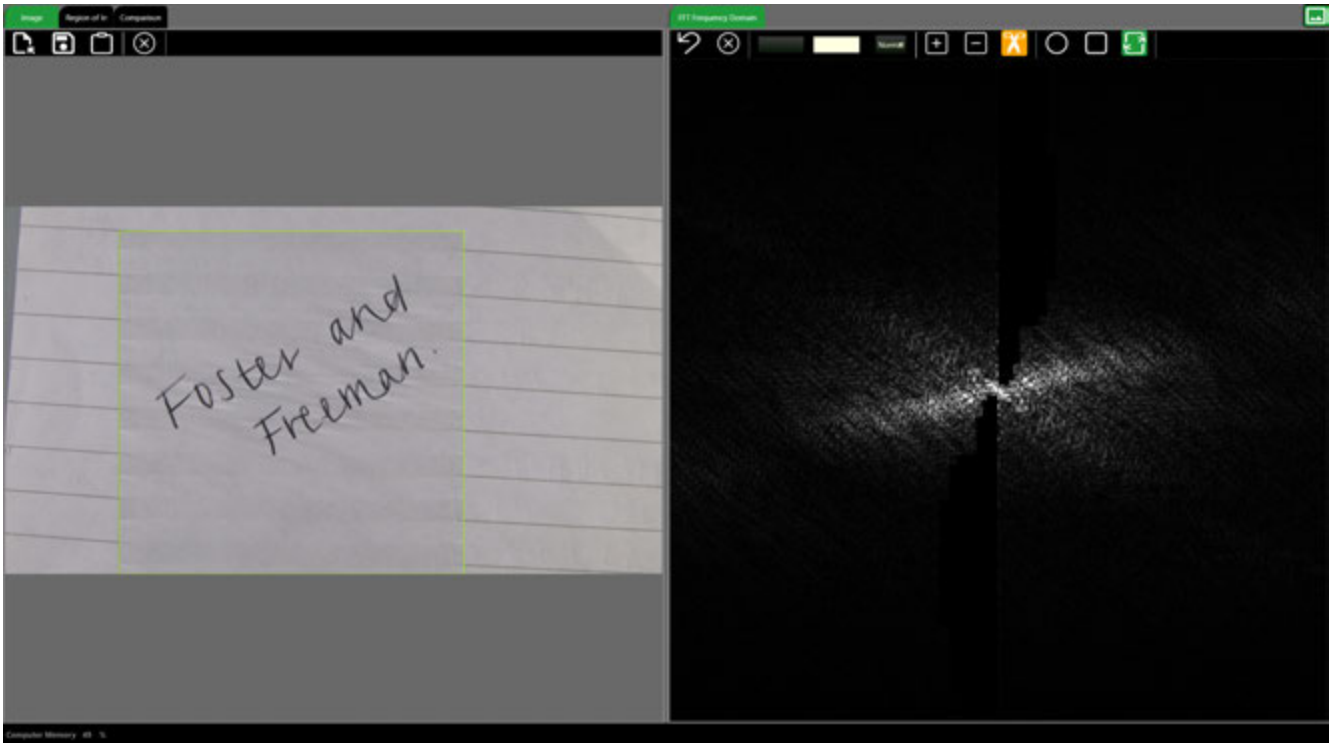
Pseudo Colour

Create a composite image with rearranged colour channels. Change the colour scheme applied using the drop-down menu. The final image does not reflect the colours of the original.

Background Removal



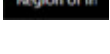
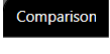
Removal of regular repeating background patterns can increase the quality of the foreground images or text using the method of FFT (Fast Fourier Transform).



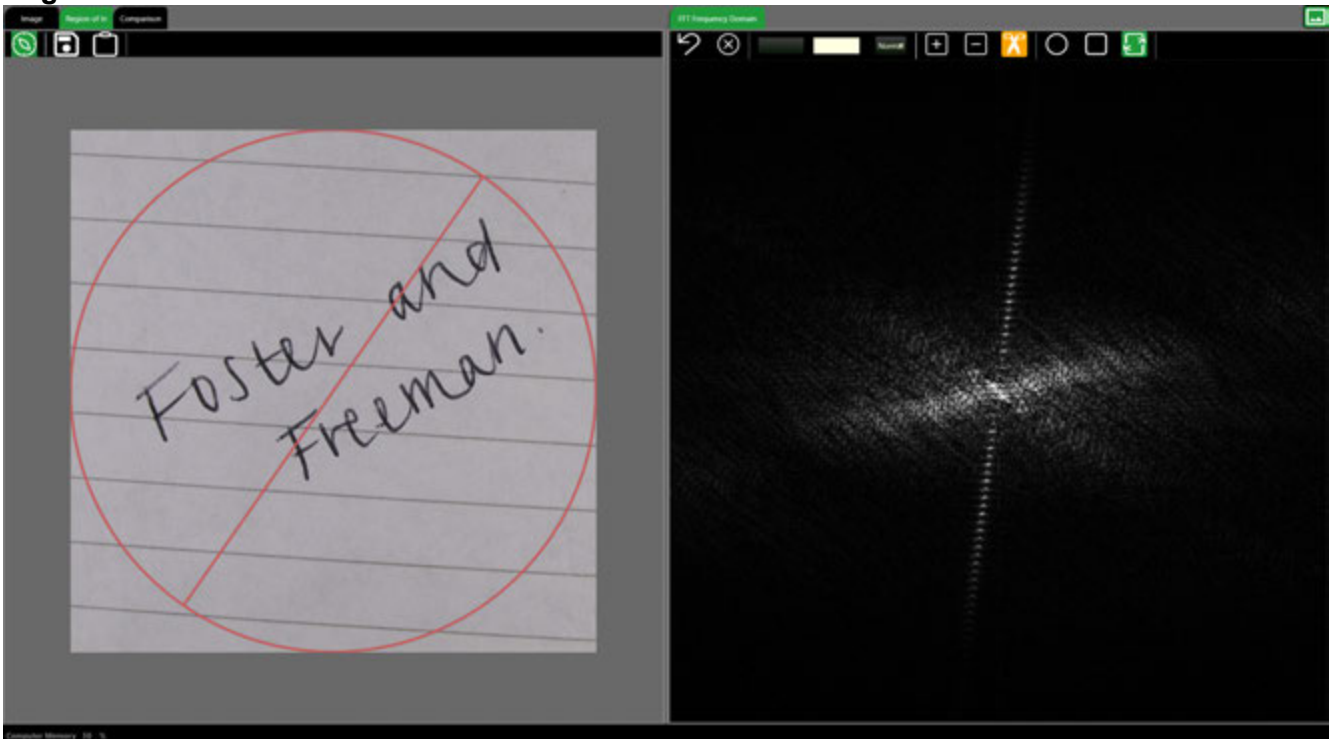
1. Open background removal.
2. Select the area on which to perform the background removal.
 - The frequency domain will open on the right-hand side of the screen. The frequency domain displays the various changes in intensities of the pixels across an image, rather than looking at each pixel separately. It is useful in highlighting repeating patterns within the spatial domain (image). These regular repeating patterns accumulate in the frequency domain and are displayed as bright spots (spikes).
3. Objects displayed in the frequency domain can be removed or enhanced by using the cut, snip or boost features on specific spikes without affecting the rest of the image.

Controls

Undo		Undo one step.
Start again		Remove all changes and start again.
Threshold		Use the sliding bar to adjust the threshold for the frequency domain. This can be used to make spikes more or less visible for selection within the frequency domain.
Mode		Select the display mode of the frequency domain from the drop-down list. Heat map adds colour to the frequency domain to make identification of individual repeating features easier to recognise.

Boost		Highlighting a spike with boost selected will enhance the spike and make the corresponding feature more visible.
Snip		Highlighting a spike with snip selected will remove a spike. This is a less-intense version of the cut function.
Cut		Highlighting a spike with cut selected will remove the spike.
Circle		The selection shape used to boost or remove a spike is a circle.
Square		The selection shape used to boost or remove a spike is a square.
Rectangle		The selection shape used to boost or remove a spike is a rectangle.
Load a file		Select to load a file.
Save		Save changes to the gallery.
Copy to clipboard		Copy the image to the clipboard.
Region of interest	 	Open the region of interest tab. Open the compass overlay.
Comparison		Open the comparison tab. This will show the original image and the adjusted image.
Return to live view		Save image to gallery and return to live view.

Region of Interest tab



In the region of interest tab, the compass overlay can be used.

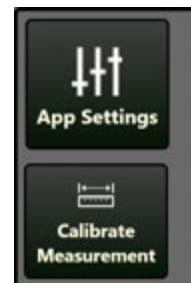
Hover over (or touch on the touch screen) an object on the frequency domain to reflect its orientation. The orientation of the line on the compass demonstrates the direction of the feature on the image in question. This can be used to ensure that the correct features are being selected for enhancement or removal.

Config Settings



Select config to open the configuration settings submenu.

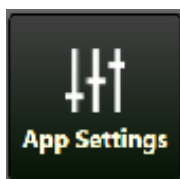
Select App Settings or Calibrate Measurement to launch the relevant feature.



App Settings

Admin mode is used within this user manual, available settings may differ.

Select this icon to view and amend the settings for the VSC®90 software.



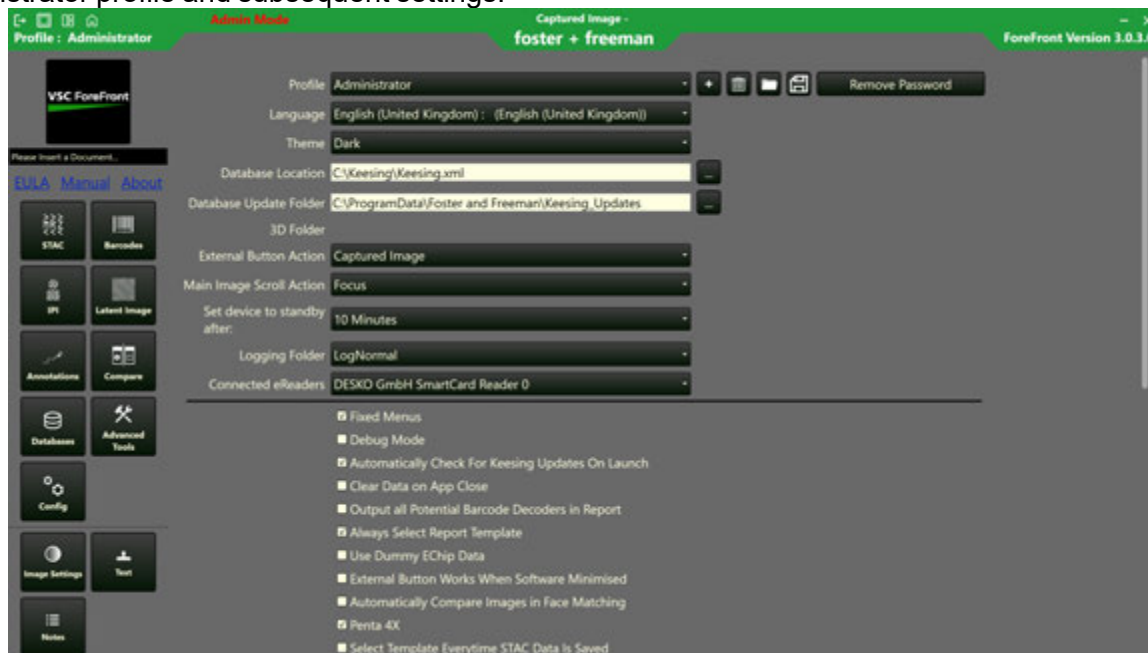
Changes may require the software to restart.

Amend language, theme and save settings as required.

Select the app settings icon again to close.

Add a password for the administrator profile using the profile section.

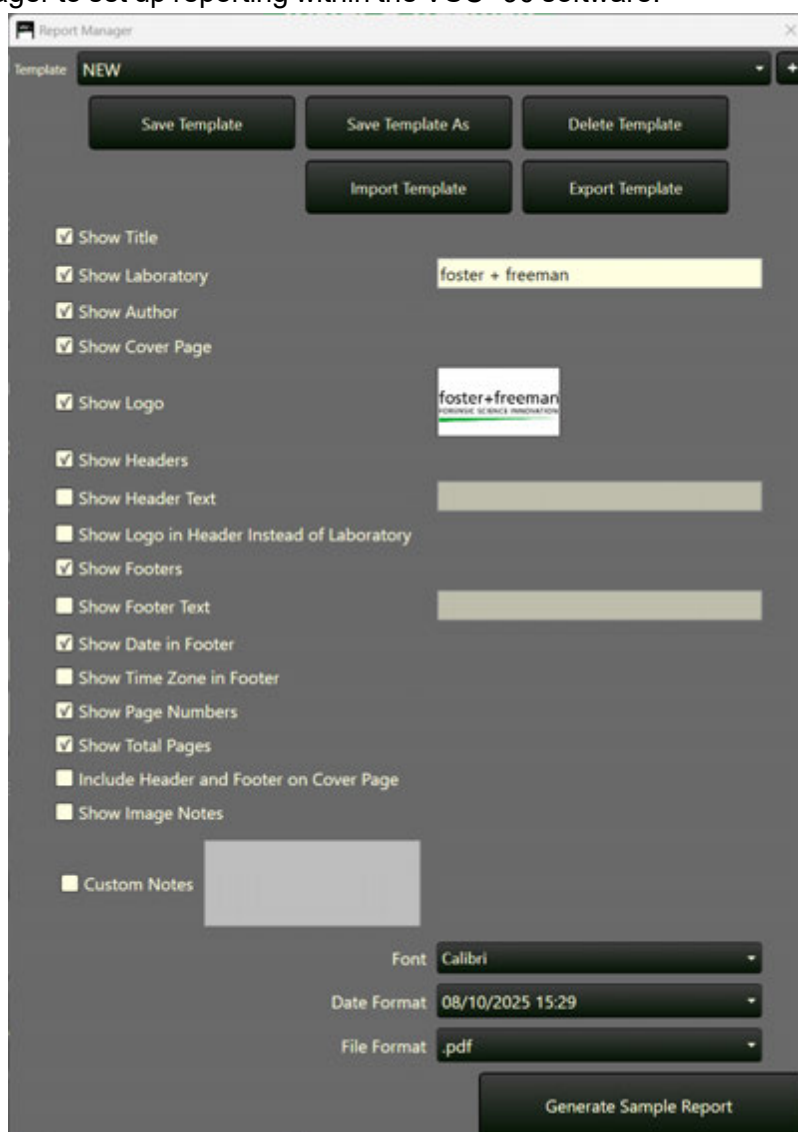
Select the +, create a password and select save. This password will then be needed to access administrator profile and subsequent settings.





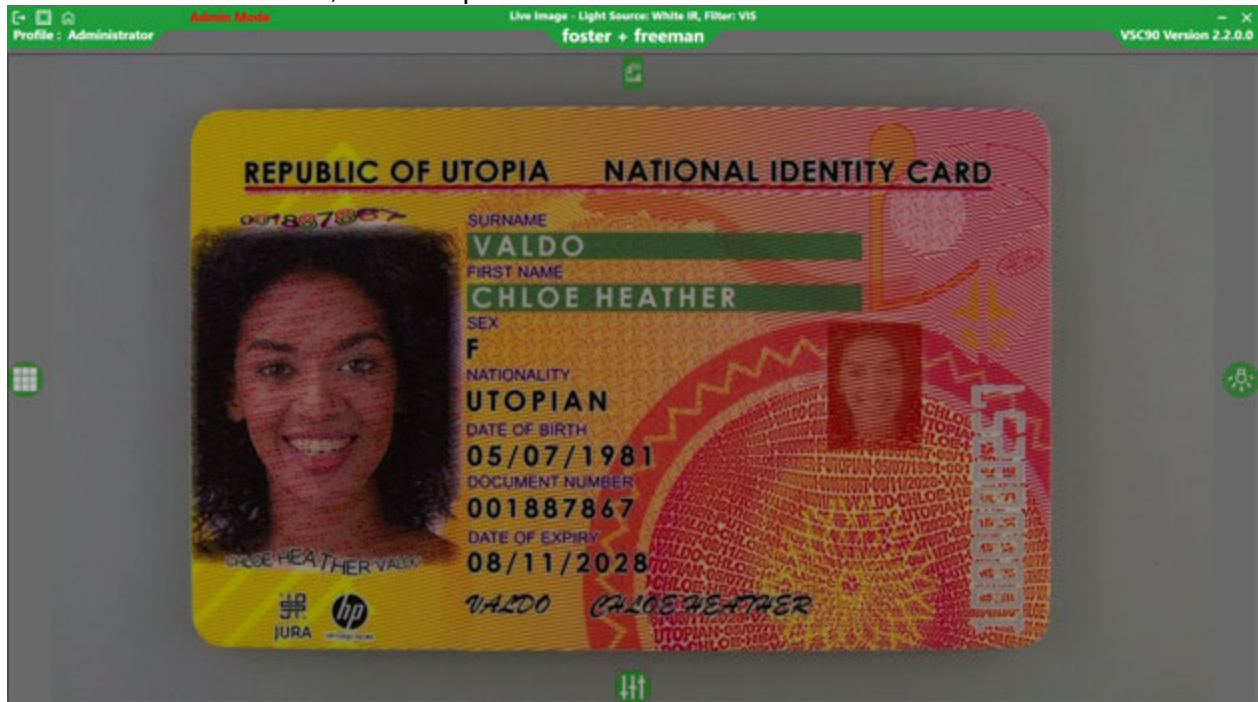
Report Manager

Use the report manager to set up reporting within the VSC®90 software.

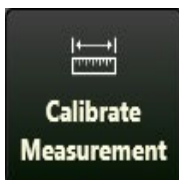


Desktop Mode (off)

Select "desktop" to deactivate desktop mode. This software is set up for full screen imaging, optimised for use with the touchscreen, with collapsible taskbars to access all software controls.



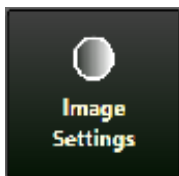
Calibrate Measurement



This will open a small window for the input of a known measurement from a scale or ruler within the image. This will allow for the calibration of measurements, allowing subsequent direct measurement of on-screen features.

Image Settings

From the image settings, the brightness, contrast, gamma, hue and saturation can be amended.



Click and drag on the sliding bar to amend these settings.

Select the relevant tick boxes to apply additional settings.

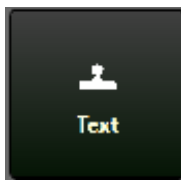
Please note that amended settings apply to the image window and therefore all images within the image gallery.



Brightness	Increases or decreases the overall lightness of an image. Adjust as required or select reset to return settings to default.
Contrast	The contrast of an image is the difference between the light and dark areas. Adjust as required or select reset to return settings to default.
Gamma	Gamma corrections control image brightness to brighten darker areas of an image whilst preserving the brightness of the already bright areas. Gamma corrections are particularly helpful when using light sources that stimulate fluorescence. Adjust as required or select reset to return settings to default.
Hue	The hue denotes the overall colour tint of an image. Adjust as required or select reset to return settings to default.
Saturation	Saturation controls the colour intensity of an image. Adjust as required or select reset to return settings to default.
Digital zoom	Adjust the slider as required to apply a digital zoom to the main image.
Sharpen	The software will compare and determine differences in brightness, and increase the contrast between adjacent pixels to improve image clarity.
Blur	The software will add blur to make the image less sharp and reduce the amount of detail.
Erode	The software will erode away the boundaries of the foreground object, useful for removing areas of white noise but shrinks the object area.
Dilate	The software will dilate pixel boundaries to accentuate features. Often used following erosion to correct for object area shrinkage.
Greyscale	Converts the image to shades of black, white and grey.
Invert	Invert the colour of each pixel in the image to its complementary colour. This may also be known as a negative.
Mirror Horizontal	Horizontally flip an image.
Mirror Vertical	Vertically flip an image.
Equalise Histogram	A computer image processing technique used to improve contrast in images by spreading out the most frequent intensity values.
Show Crosshairs	Select to show the cross-hairs in the centre of the live image overlay for ease of aligning evidence.
Show Edge Markers	Select to show alignment lines on the edges of the live image overlay for ease of aligning evidence.
Grid	Select to show a grid on the live image overlay for ease of aligning evidence.
Ruler	Apply a ruler overlay.
Binarise	Images are converted into a binary black and white image based on the pixel value of the original.

Pixel Intensity Chart	Also known as a histogram, the pixel intensity chart demonstrates the number of pixels in an image at each different intensity value.
Rotation	Use +/- to rotate the image.
Channel	Select the relevant option from the drop-down menu to view the relevant colour channel. Colour channels refer to the Red/Blue/Green colour pixels that make up a colour image.
Isolate	Select the required colour channel to isolate from the drop-down bar. • All • Green • Red • Blue
Enhance	Select the required colour channel to enhance from the drop-down bar, and use the sliding bar to increase or decrease the applied enhancements. Enhancements include: • All • Green • Red • Blue

Text



The text icon allows for the addition of text, or notes, to an image. The position, alignment, font, colour and size of this text can be changed.

☐ Draw Settings On Image

Position
Below Image

Alignment
Centre

Font
Arial

Font Size
12

Text Colour

Background Colour

☒ PC
☒ Operating System
☒ Camera

☒ App Info
☒ Serial Number
☒ Username

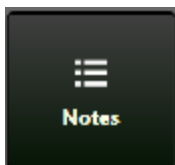
☒ Camera Settings
☒ Light Source
☒ Filter

☒ Date

☒ Show Laboratory

Custom Text

Add Notes



This opens a window containing a notepad. This notepad can be moved around or pinned to the right side of the main image viewer. Notes can be added, saved, or discarded.

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