

Ondulo Defects Detection Software

Instruction Manual

Ver: 1.0.30.8167

Thank you for purchasing this Rhopoint product.
Please read these instructions carefully before use and retain for future reference.

English



This instruction manual contains important information about the setup and use of Ondulo Defects Detection Software. It is therefore essential that the contents be read before using the software.

If the software is to be used by others you must ensure that this instruction manual and license dongle is supplied with the software. If you have any questions or require additional information about Ondulo Defects Detection please contact the Rhopoint Authorised Distributor for your region.

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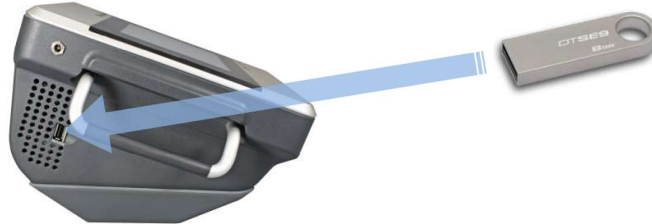
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Contents

Introduction.....	4
Installation	4
<i>Projects, Series, Measurements and Analyses</i>	7
<i>Main Toolbar</i>	8
<i>Tree View Selector</i>	9
<i>Images</i>	10
<i>Reflection</i>	10
<i>Analyses</i>	12
<i>User</i>	18
<i>Files</i>	18
<i>Regions</i>	19
<i>Measurements</i>	22
<i>Viewer</i>	23
<i>One / Two Viewers Display</i>	26
<i>Cross Section Viewer Display</i>	29
Defects Detection	34

Introduction

Rhpoint Ondulo Defects Detection is a versatile software package for the stand alone analysis of measurement data files from Optimap PSD. Data transferred using either the USB memory key or data transfer cable can be easily recalled into the Ondulo environment allowing rapid evaluation and reporting of the measured surface.



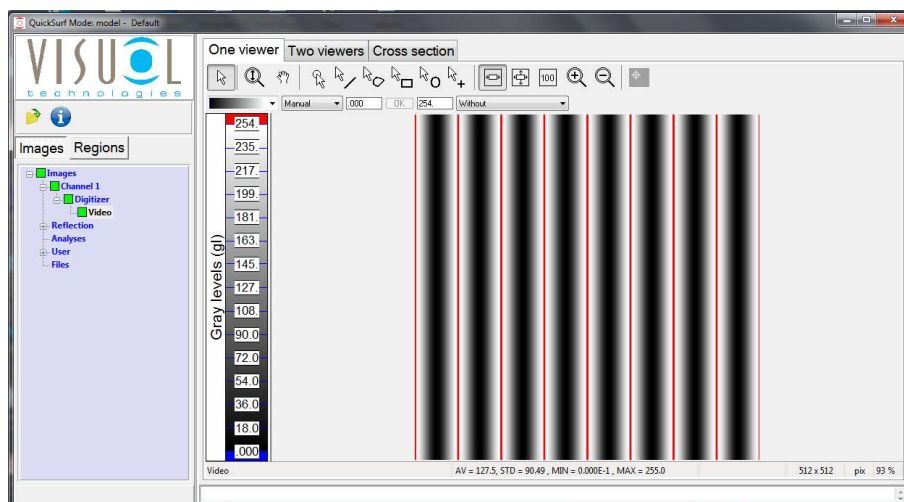
Surface effects including texture, flatness, number, size and shape of local defects can be quickly identified, mapped and quantified. Information can be displayed in Ondulo in curvature (m^{-1}), slope or altitude (μm) in either single, dual or 3D view.

The 3D view features full image rotation and X/Y cross sectional viewing. Powerful drag and drop capability allows images and data to be seamlessly transferred to Microsoft Word for instant report generation.


Installation

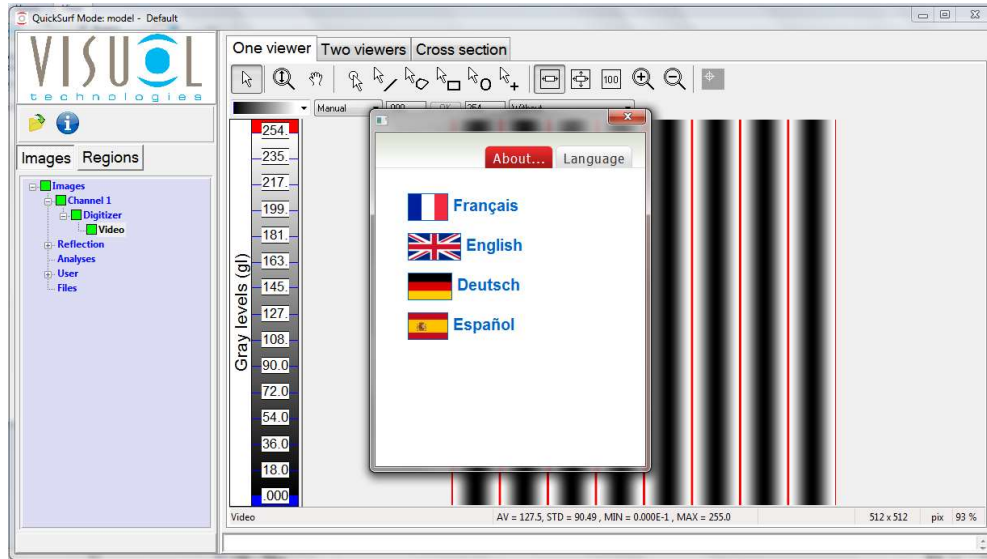
Ondulo Defects Detection software is supplied as an executable file on the memory stick provided. With the memory stick inserted into the USB port of the computer the software can be installed by double clicking the .exe file contained on it. A Setup Wizard will be displayed guiding you through the installation process; when prompted accept the default choices shown.

A desktop shortcut named Ondulo will be created as part of the setup process. To start Ondulo Defects Detection double click this shortcut, the main screen will be shown as below:




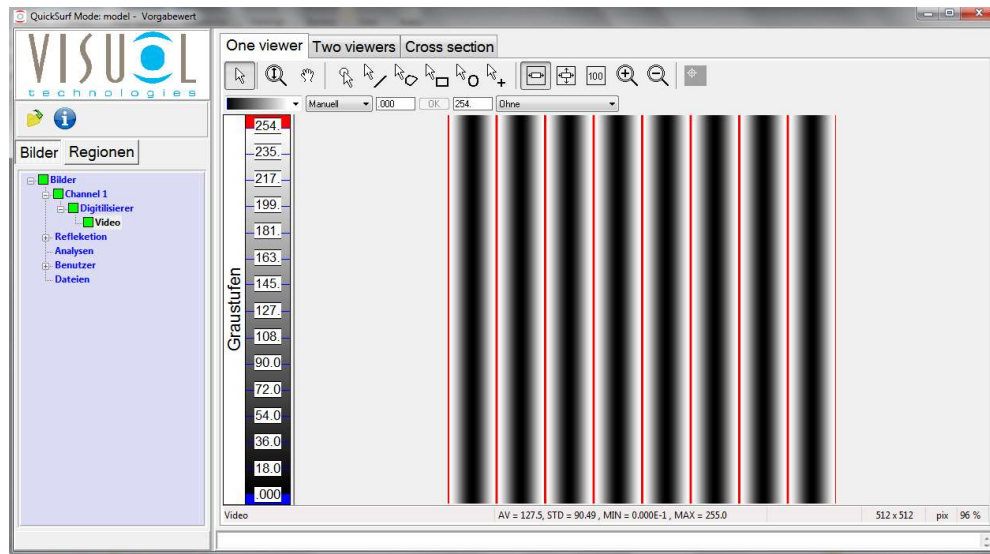
By default Ondulo Defects Detection is set to display in the English language.

To change the language click the about button  and select “Language” when the dialogue box is displayed. Other languages available for the software are French, German and Spanish. Click on the language required to select.

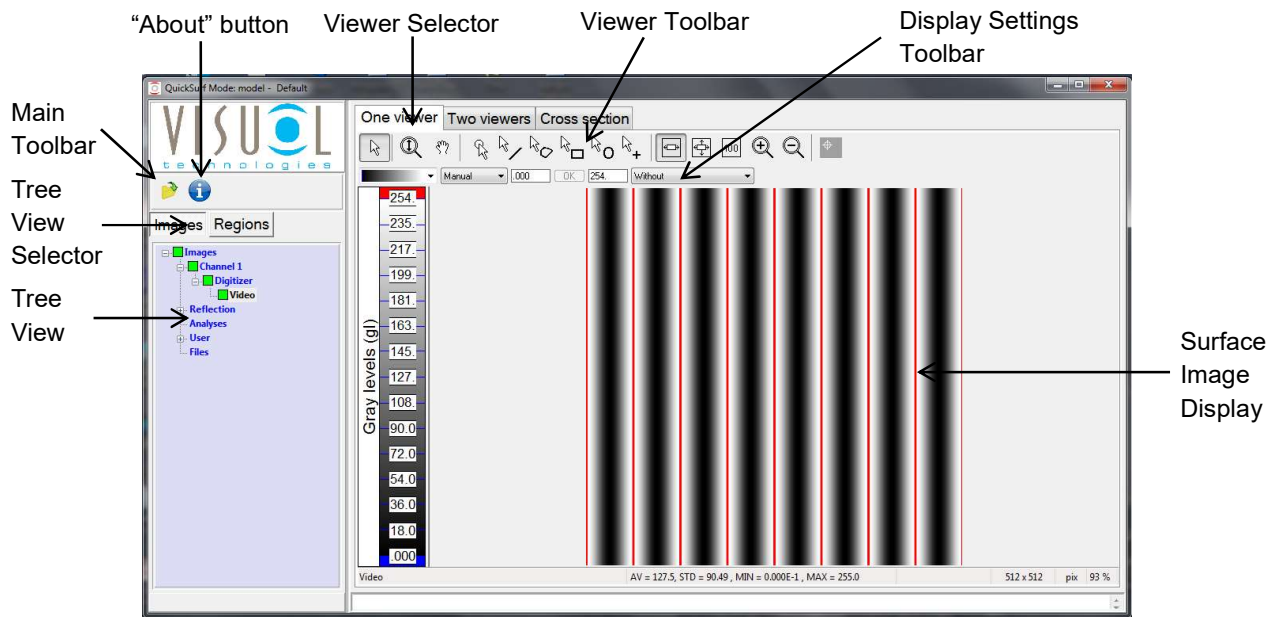


The main screen will update to the new language.

Click  to exit the dialogue box.



Overview



The main screen of the viewer is shown above, it is split into three sections.

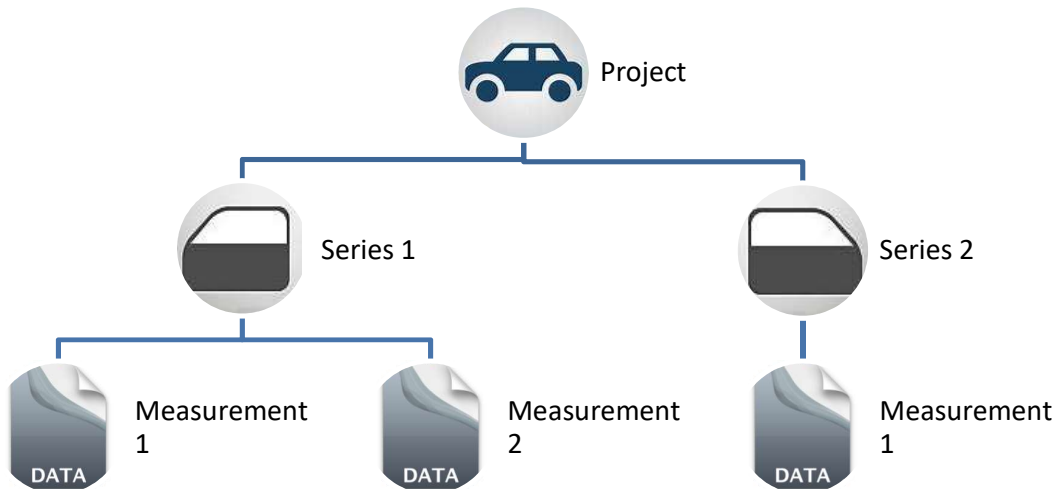
To the left of the screen is the main toolbar and the project, measurement, tree view selector and tree view. This section allows the opening and closing of projects and individual measurements within them. The tree view allows the viewing of surface image data or a pre-configured image analysis.

To the top of the screen are the viewing options. This section allows the viewer selection and the configuration of the surface image view including colour and scaling.

In the middle of the screen is the Surface Image Viewer. Surface measurements can be displayed in Curvature (m^{-1}), Texture or Altitude by selecting the appropriate image in the Selection Menu. To the bottom of the Viewer screen information is displayed relating to the zoom percentage, statistics and image name being viewed.

Projects, Series, Measurements and Analyses

Ondulo Reader uses the same structure for measurement data as Optimap.



A **Project** is the main parameter which contains a **Series** of different surface types and the **Measurements** made.


So for example a project for an automotive application might be named Car, therefore **Series** could be named to include **Measurements** on different areas such as the doors, bonnet, roof etc. Measurements are named by number according to the sequence in which they are measured.

Analyses in Ondulo Reader are preset image processing modules that produce standardised output data dependant on their function. For instance Analyses X, Y and Y+X allows viewing of the image either in one or both directions. This is useful for the evaluation of directional effects of texture on the surface.

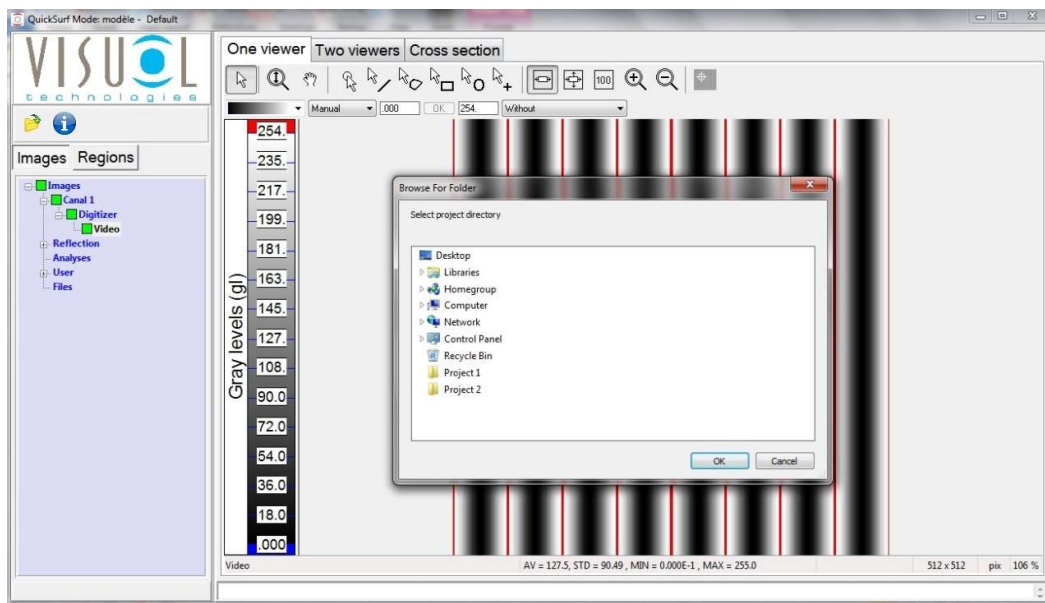
Main Toolbar

Two icons are displayed on this toolbar –

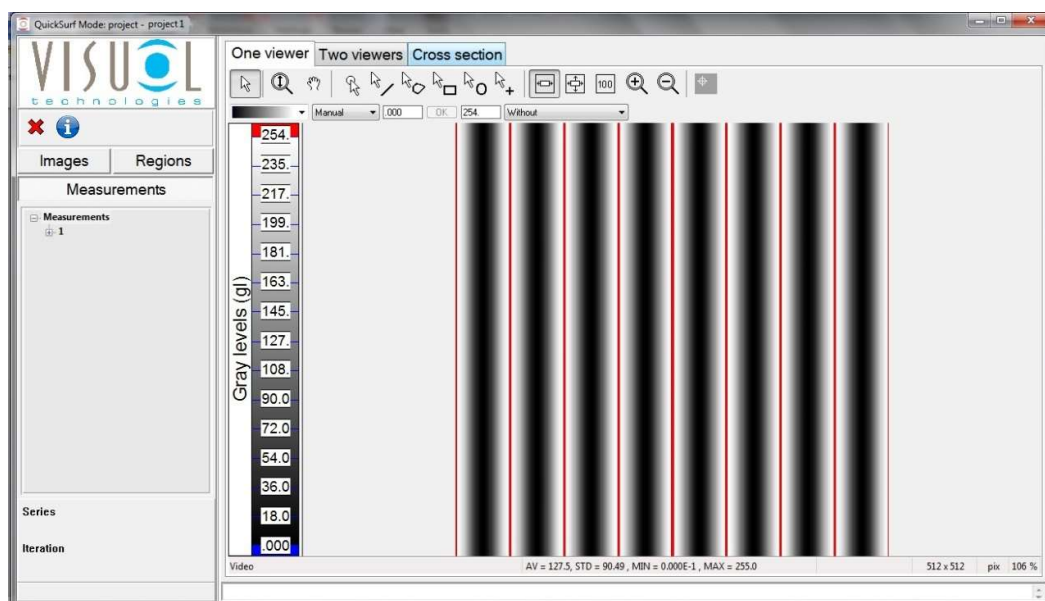
 **Read a Project** – To open an existing saved project.

 **Close a Project** – To close the current project saving any changes made.

To read a project left click the Read Project icon, a dialogue box will be displayed requesting the location of the project folder. Navigate to it using the file browser in the dialogue box and press OK.



The project will open and the screen will change to –



Tree View Selector

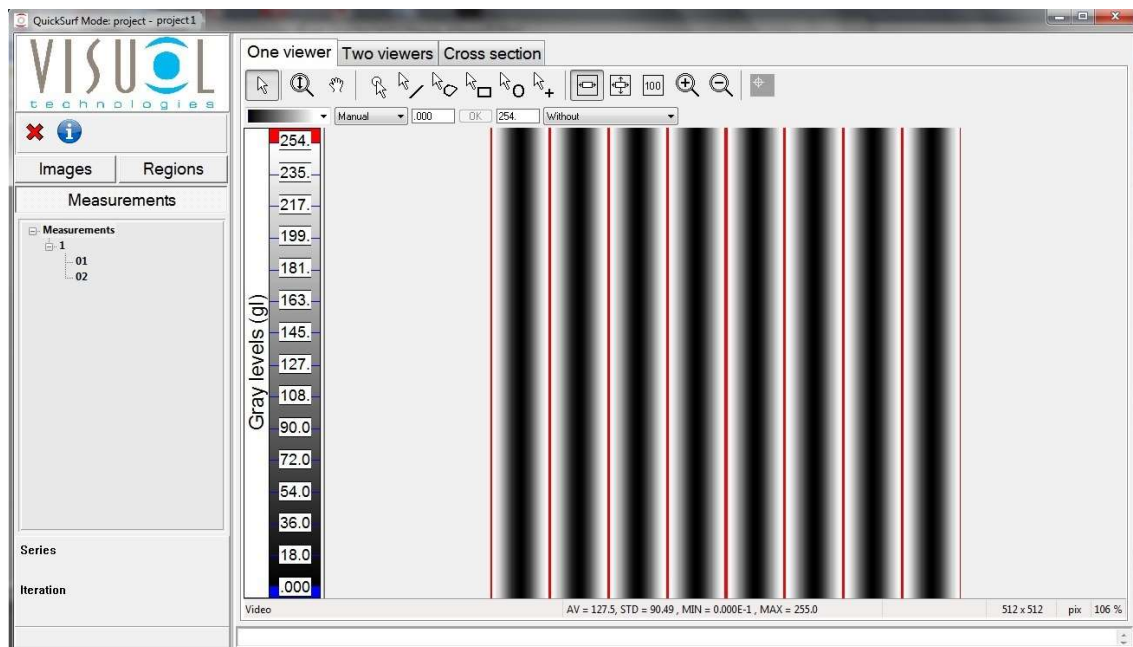
With a project open, three tabs are displayed -

Images – Containing image data and analyses in a tree view

Regions - This tree view enables management of regions (creation, edition and deletion) in a picture.

Measurements - Selection menu tree containing individual measurements within the project grouped according to **Series**

To open a measurement select the **Measurements** tab. Each measurement contains the series within the project.



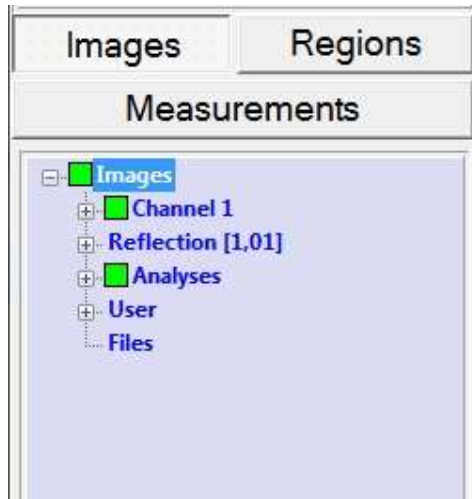
In the example displayed above one series is displayed, 1, containing two measurements (01, 02).

Double clicking the measurement opens it.

Images

The images tree view allows the selection and on-screen viewing of measurement data in the Surface Image Viewer.

The tree view comprises of 5 sections:-



Channel 1 – In Ondulo Reader this has no function.

Reflection – Raw data captured during the PSD process

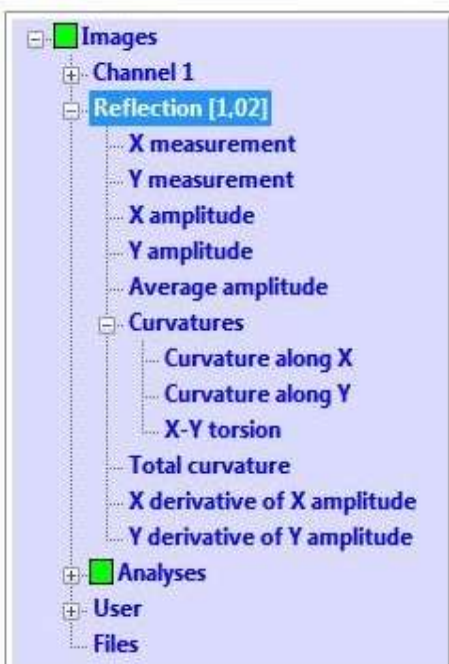
Analyses – Pre-defined image processing of measurement data including defects detection

User – User selectable storage area for project measurement data

Files – Opens saved Ondulo files in .res format as detailed later in this manual

Reflection

The Reflection tree view allows the viewing of image data measured during the PSD process –



X / Y measurement – Displays the reflected sinusoidal fringe pattern projected from the surface in either X or Y direction

X / Y amplitude – Not used

Average amplitude – Not used

Curvatures – Sub tree containing reflected raw image data from the surface comprising–

Curvatures along X – Image of reflected curvature data in X direction

Curvatures along Y – Image of reflected curvature data in Y direction

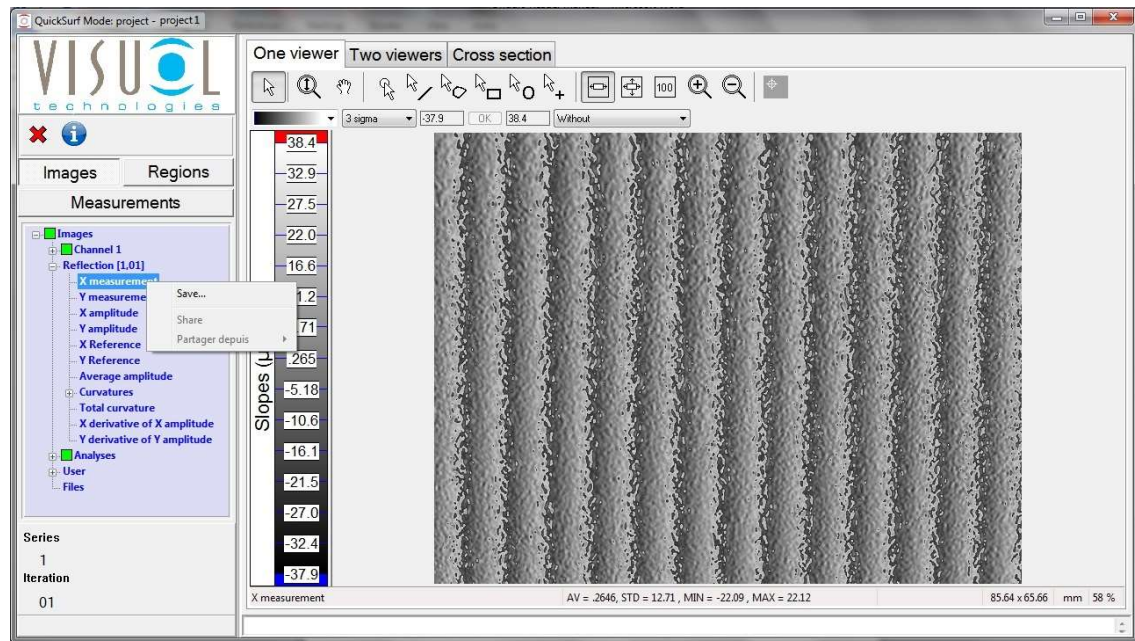
X-Y Torsion – Image of combined reflected derivative curvature data in X/Y direction

Total Curvature – Image of total curvature data

X derivative of X amplitude – Not used

Y derivative of Y amplitude – Not used

Reflection data images can be stored in the project by right clicking on the relevant branch of the tree view.



A dialogue box will be displayed asking whether the image is to be saved.

Clicking Save... opens another dialogue box requesting the location where the image is to be saved, what the filename is and in what format.

By default images are stored as Ondulo type (.res) in the Report folder of the active project. Ondulo type files can be opened using the **Files** option at the end of the main tree view as detailed later in this manual.

Images can also be saved in four other different types:-

Image file – JPEG

Image file – TIFF

Image file - PNG

Spreadsheet file – X / Y point by point data in .csv format

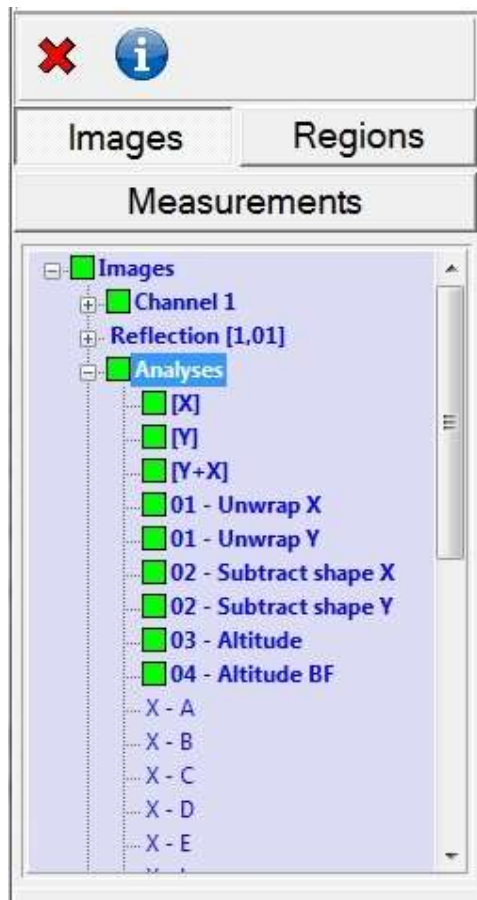
Analyses

The Analyses tree allows the viewing of processed measurement data.

Ondulo Defects Detection software contains preset analyses that produce standardised output images and also user configurable defects detection on any of the analysed images.

When a measurement is opened all analyses set to “Auto” are run automatically. These analyses are shown in bold font. When run a green box appears to the left of the analyses indicating that it has run successfully. Analyses which are set to “Manual” are shown in normal font no green box is displayed.

The analyses tree contains the following labels;-



X – Displays surface curvature image data in X direction

Y – Displays surface curvature image data in Y direction

Y+X - Displays surface curvature image data in X/Y direction

01 – Unwrap X to Altitude BF – Preset analysis to convert curvature image data into altitude image data in μm . Altitude BF is the analyses containing the converted altitude image map.

X – A - Displays band filtered (0.1mm - 0.3mm) curvature image data in X direction

X – B - Displays band filtered (0.3mm - 1mm) curvature image data in X direction

X – C - Displays band filtered (1mm - 3mm) curvature image data in X direction

X – D - Displays band filtered (3mm - 10mm) curvature image data in X direction

X – E - Displays band filtered (10mm - 30mm) curvature image data in X direction

X – L - Displays band filtered (1.2mm - 12mm) curvature image data in X direction

X – S - Displays band filtered (0.3mm -1.2mm) curvature image data in X direction

Y – A - Displays band filtered (0.1mm – 0.3mm) curvature image data in Y direction

Y – B - Displays band filtered (0.3mm - 1mm) curvature image data in Y direction

Y – C - Displays band filtered (1mm - 3mm) curvature image data in Y direction

Y – D - Displays band filtered (3mm - 10mm) curvature image data in Y direction

Y – E - Displays band filtered (10mm - 30mm) curvature image data in Y direction

Y – L - Displays band filtered (1.2mm - 12mm) curvature image data in Y direction

Y – S - Displays band filtered (0.3mm -1.2mm) curvature image data in Y direction

Y – A - Displays band filtered (0.1mm – 0.3mm) curvature image data in Y direction

Y – B - Displays band filtered (0.3mm - 1mm) curvature image data in Y direction

Y – C - Displays band filtered (1mm - 3mm) curvature image data in Y direction

Y – D - Displays band filtered (3mm - 10mm) curvature image data in Y direction

Y – E - Displays band filtered (10mm - 30mm) curvature image data in Y direction

Y – L - Displays band filtered (0.3mm -1.2mm) curvature image data in Y direction

Y – S - Displays band filtered (1.2mm - 12mm) curvature image data in Y direction

Y+X – A - Displays band filtered (0.1mm – 0.3mm) curvature image data in X/Y direction

Y+X – B - Displays band filtered (0.3mm - 1mm) curvature image data in X/Y direction

Y+X – C - Displays band filtered (1mm - 3mm) curvature image data in X/Y direction

Y+X – D - Displays band filtered (3mm - 10mm) curvature image data in X/Y direction

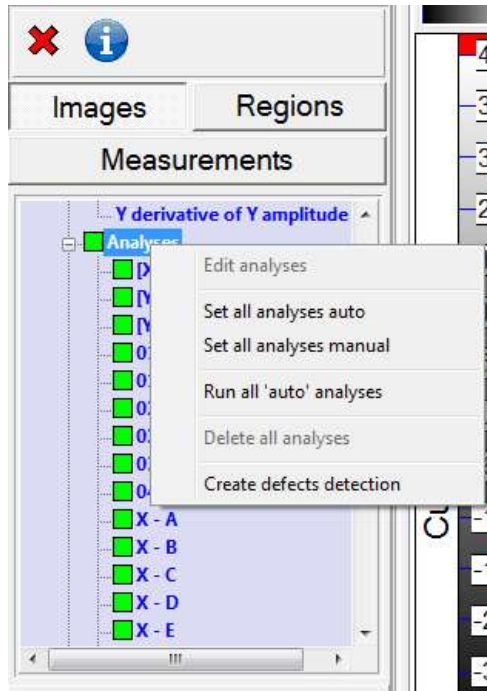
Y+X – E - Displays band filtered (10mm - 30mm) curvature image data in X/Y direction

Y+X – L - Displays band filtered (1.2mm - 12mm) curvature image data in X/Y direction

Y+X – S - Displays band filtered (0.3mm -1.2mm) curvature image data in X/Y direction

There are two ways of changing analyses from “Auto” to “Manual” -

Globally – by right clicking on the analyses label -

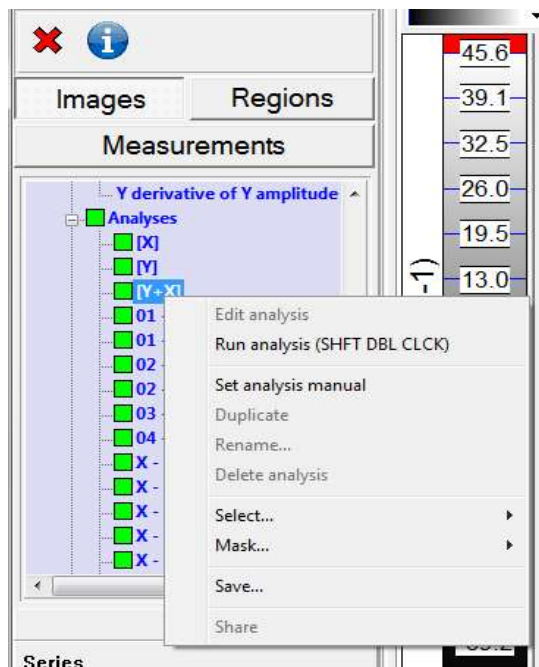


Allowing all analyses to be set to either “Auto” or “Manual”

If all analyses are set to manual none will be run when “Run all ‘auto’ analyses” is clicked

In this dialogue box the option “Create Defects Detection” allows a new defects analysis to be created, the instructions for which are detailed later in this manual.

Individually - by right clicking on the individual analyses label –

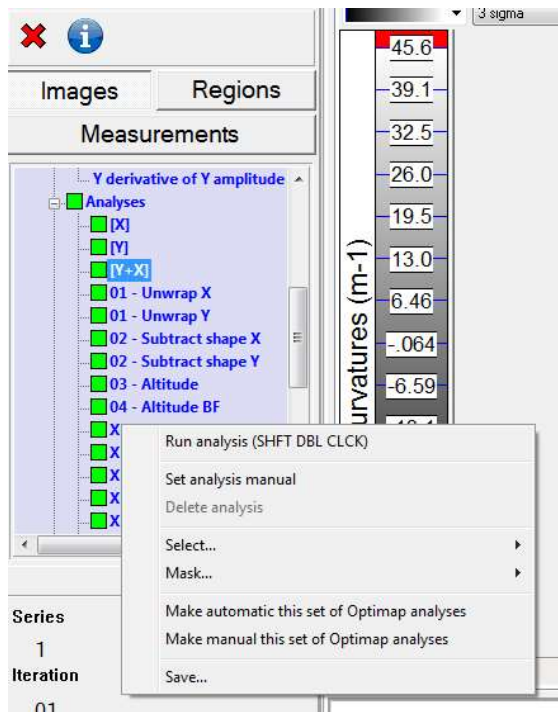


Allowing each individual analysis to be set to either “Auto” or “Manual”

Each individual analysis can now be run without having to run all analyses

The Save.. option in this dialogue box allows image data to be saved as detailed earlier in the Reflection section

Grouped - by right clicking on any label of a group of analyses



Allowing groups of similar analyses to all be set to either “Auto” or “Manual”

Individual analysis can be set also.

When any of the analyses are changed, the “Run analysis” option must be selected so that the image data is processed allowing the image map to be displayed when the label is selected.

Two other options are available in this dialogue box;

Select.... and Mask....

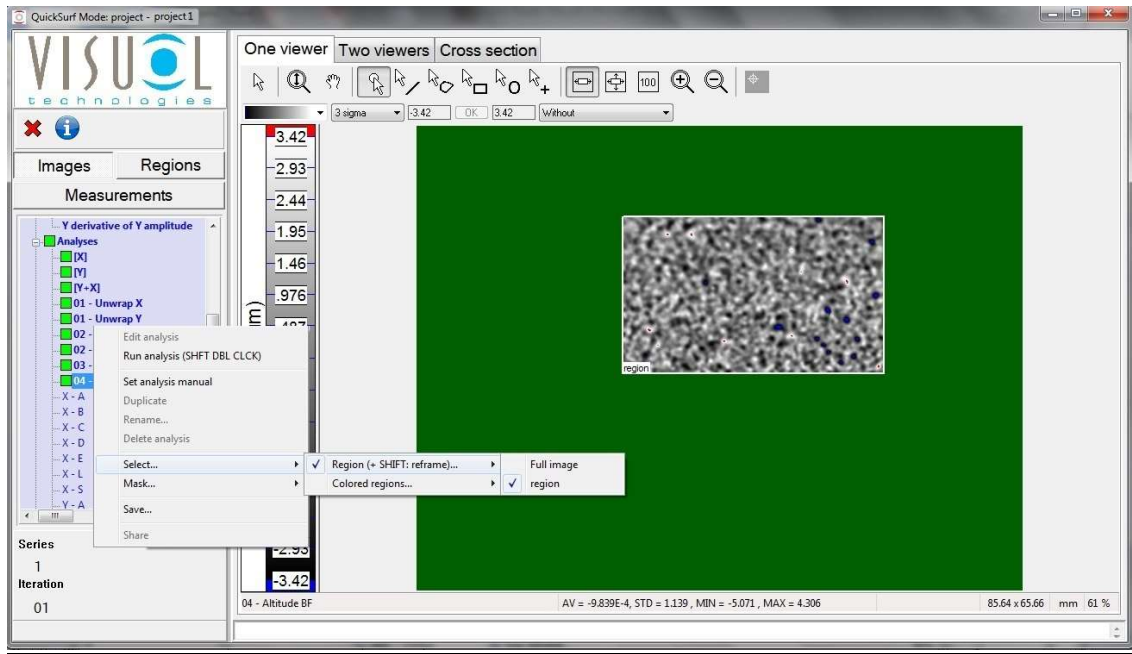
Both of these options allow the selection or masking of different regions created in a measurement image, instructions for which are covered in the Regions section of this manual that follows.

The Select option allows the masking of the image outside the region selected

The Mask option allows the masking of the image inside the region selected

When each option is selected Ondulo automatically recalculates the curvature information, updating the altitude and texture values, for the new region

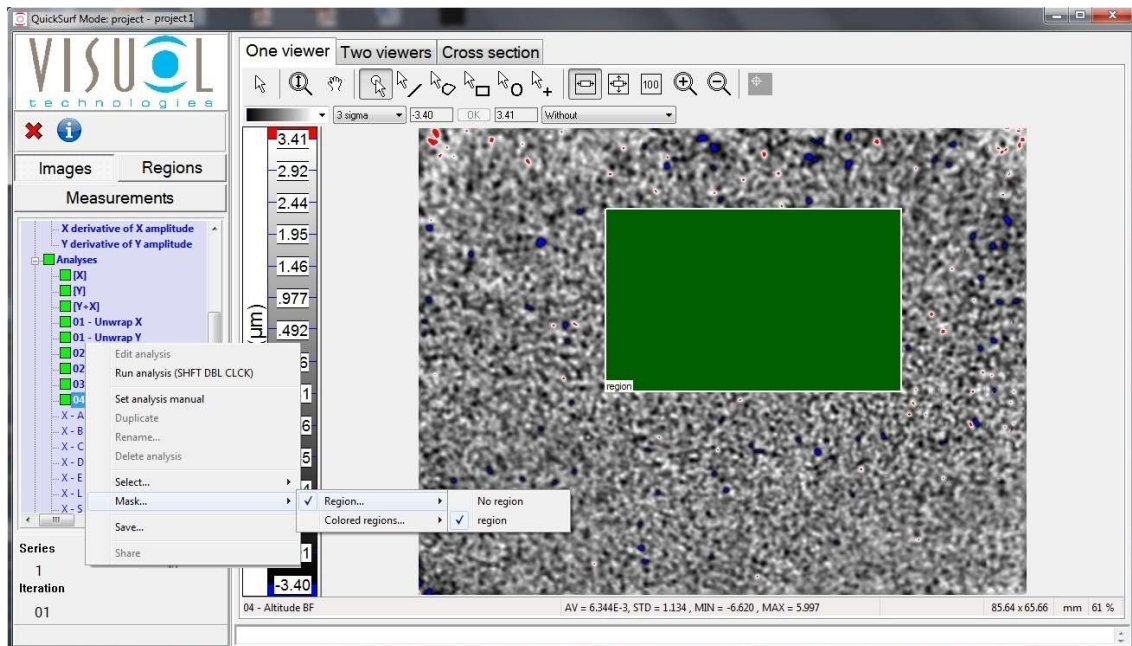
As an example the image below shows the effect of applying the Select.. option to an altitude image



Here, the area outside the image has been masked (indicated by the green area) using region, indicated by a tick mark alongside, all measurements have been updated to the new region (inside).

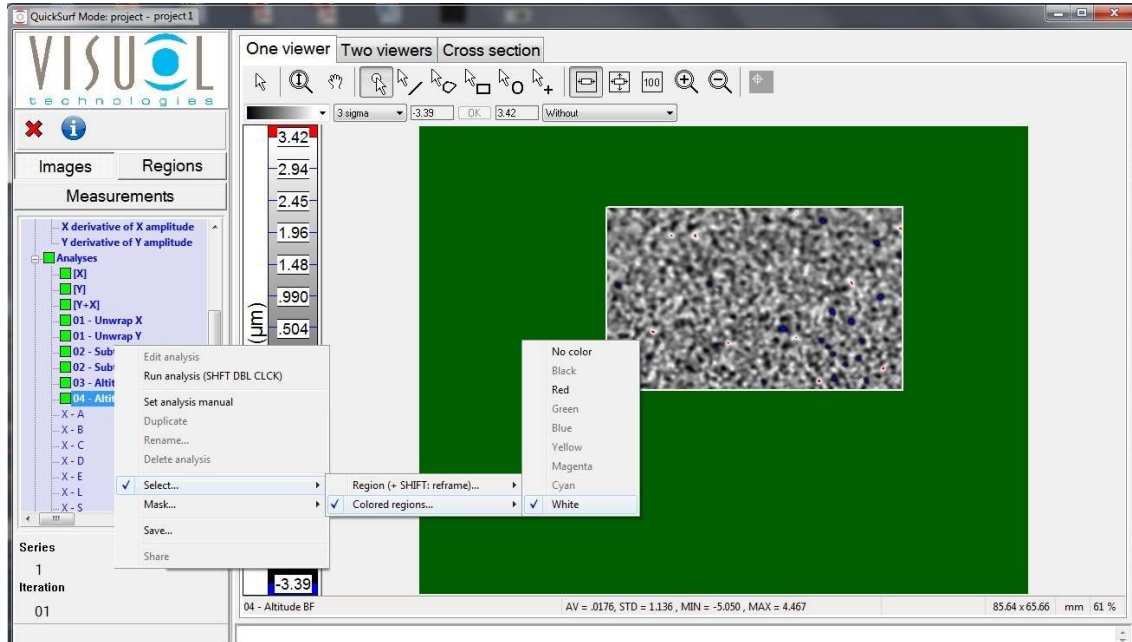
Selecting Full image changes back to the full image view.

The image below shows the effect of applying the Mask option to the same altitude image



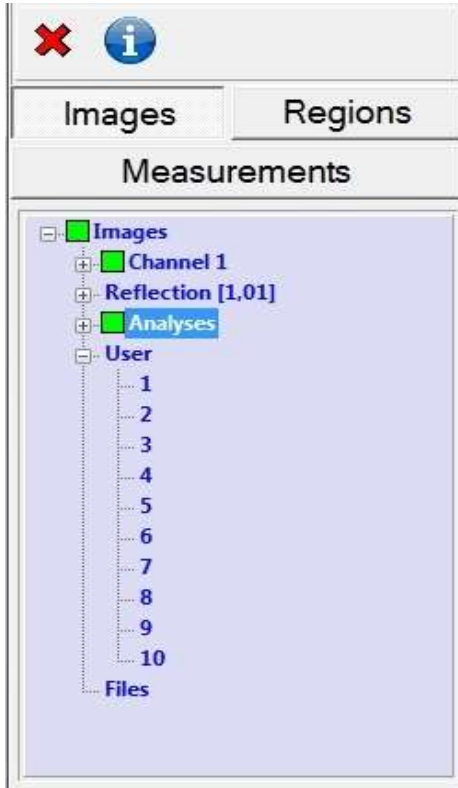
Here, the area inside the image has been masked (indicated by the green area) using region. Again all measurements have been updated to the new region (outside).

Both Select and Mask can also be performed using the colour of the region



User

The user option allows the temporary storage of project images. This useful feature allows images to be quickly recalled for review or comparison with other project images.

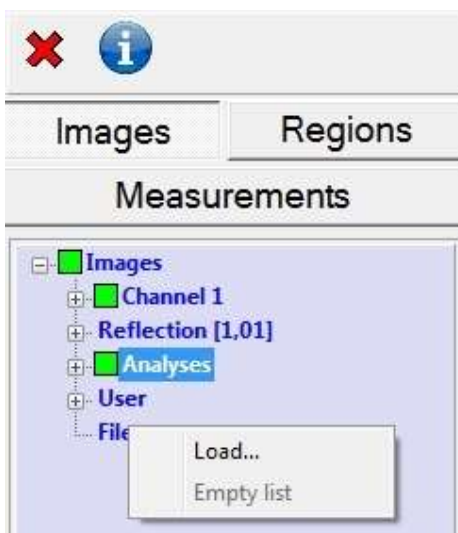


The User tree contains 10 locations which images can be stored into by simply dragging and dropping the required image into it. All images remain temporarily stored when Ondulo is active. Exiting Ondulo automatically empties the User storage area.

When stored the same Save... function is available as described earlier by right clicking on the relevant stored user image label.

By right clicking on the User label all user data stored can be emptied from the list.

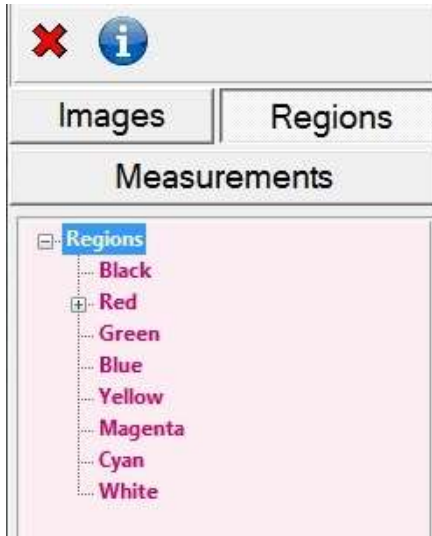
Files



This option allows previously saved Ondulo image files in .res format to be opened directly from either an internal or external storage location. The images can be stored in the User area for display.

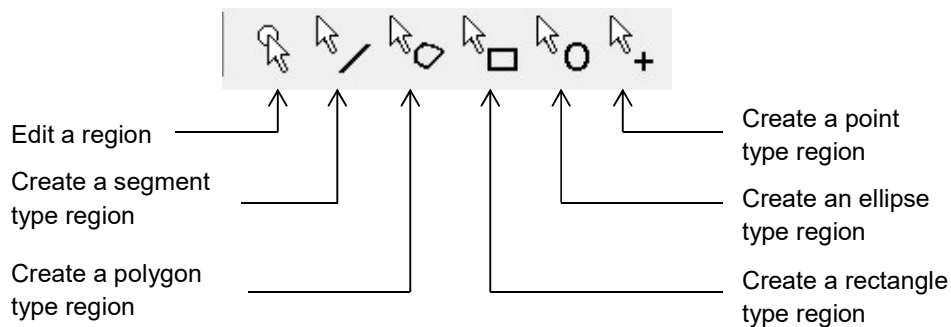
Regions

The regions tab displays a tree view that allows the management of user defined regions created in an image.



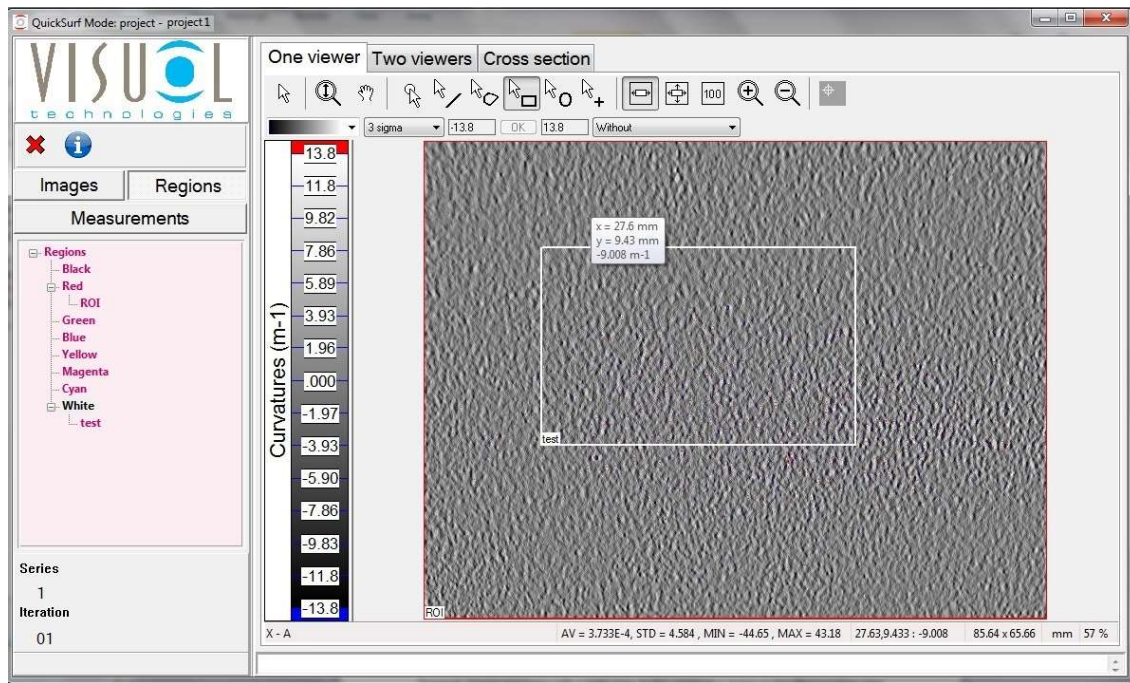
A region is an area, with a given color and a given geometrical shape, drawn on the image in the viewer. Normally when an image is opened from an Optimap measurement the only region that exists is one defined as "ROI" in Red. This region represents the total surface area of measurement for the Optimap, it should therefore never be deleted or amended.

A region can be drawn manually on an image using the buttons on the viewer toolbar.

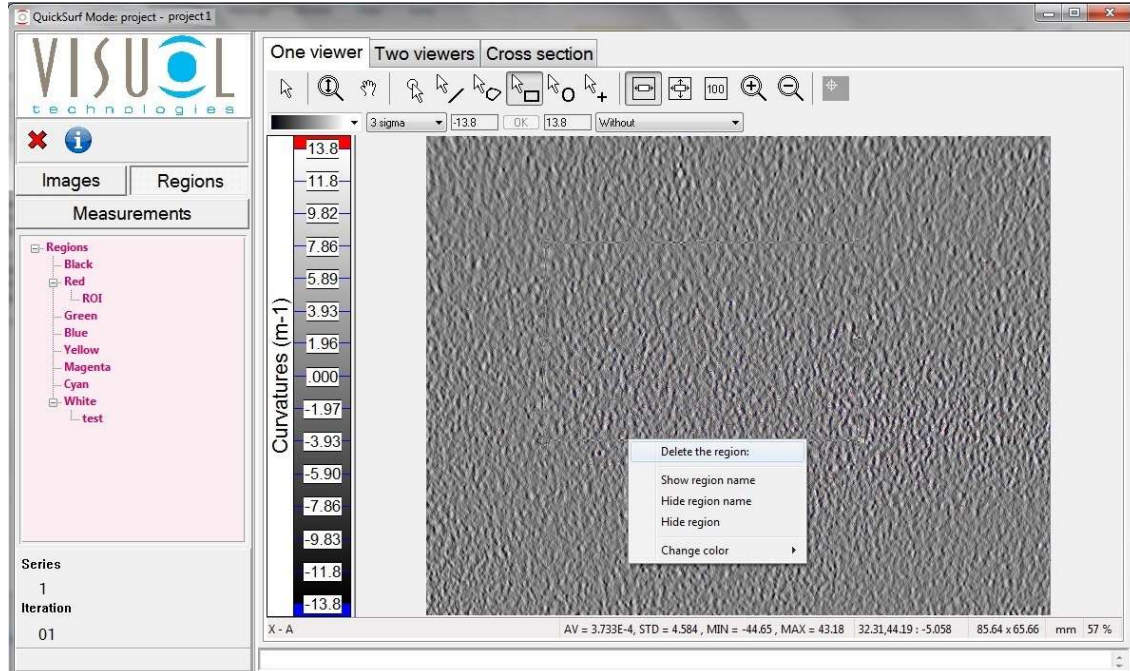


By selecting one of the above buttons the region can be created by pressing and holding down the left mouse button whilst moving the mouse to the desired size. When the mouse button is released a dialogue box will be displayed requesting the name and colour required of the region. To edit, select the button from the viewer toolbar and left click on the region of interest, this will allow the movement and resizing of the region.

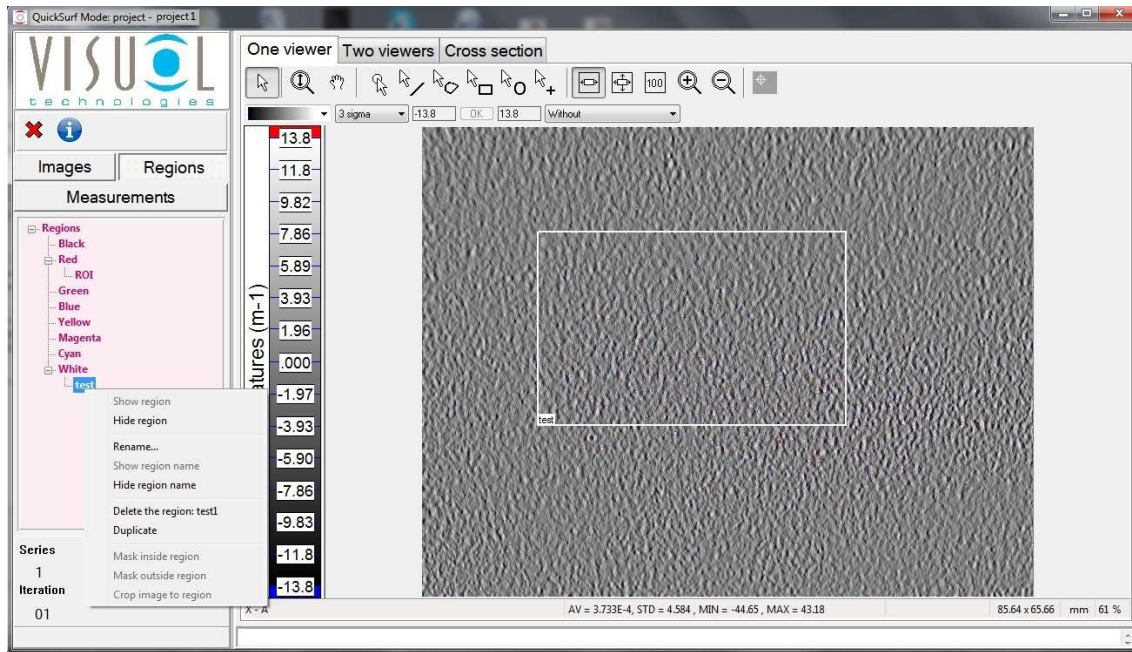
In the image below a white region named “test” has been created.



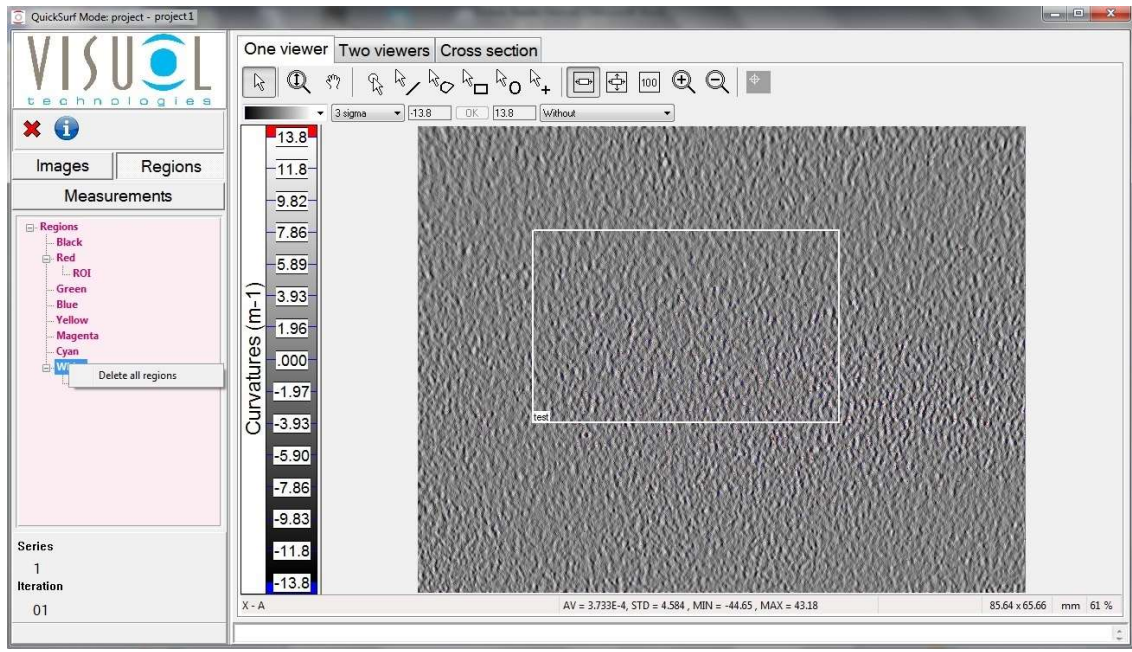
With the relevant region creation button pressed on the toolbar, right clicking on the region accesses a further menu -



This allows the deletion of the region, to display / hide the region name or to completely hide the region. It also allows the colour of the region to be changed if incorrectly selected when created.



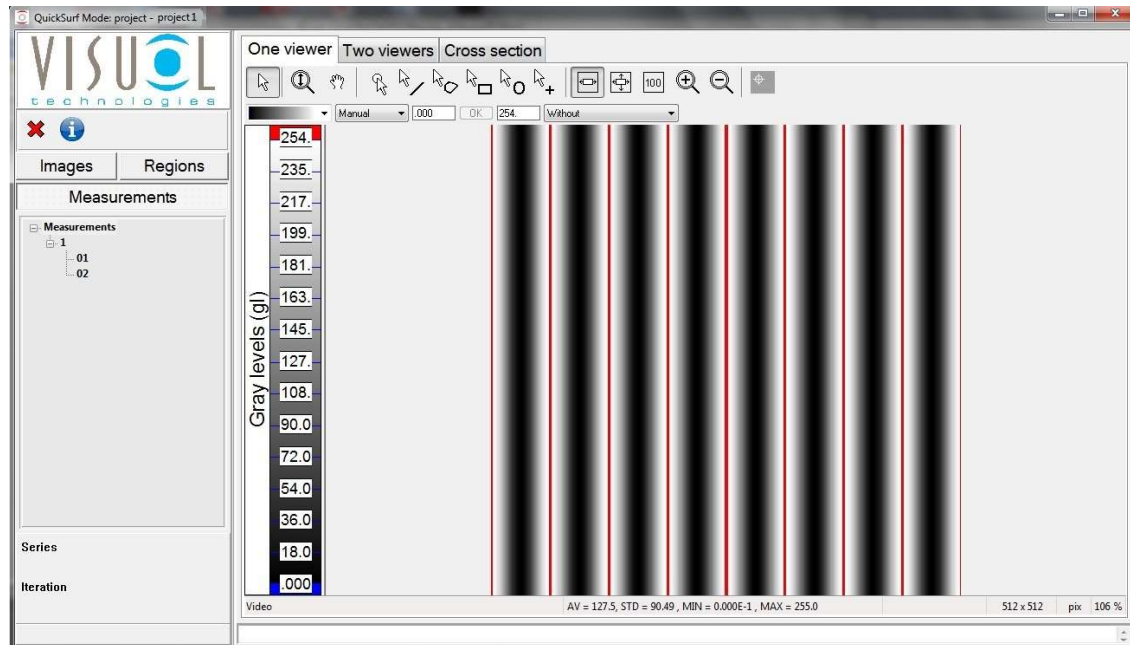
Right clicking on the name of a region in the tree view allows the region to be hidden, renamed, deleted or duplicated. The region name can also be hidden.



All regions can be deleted from a colour by right clicking on the colour name

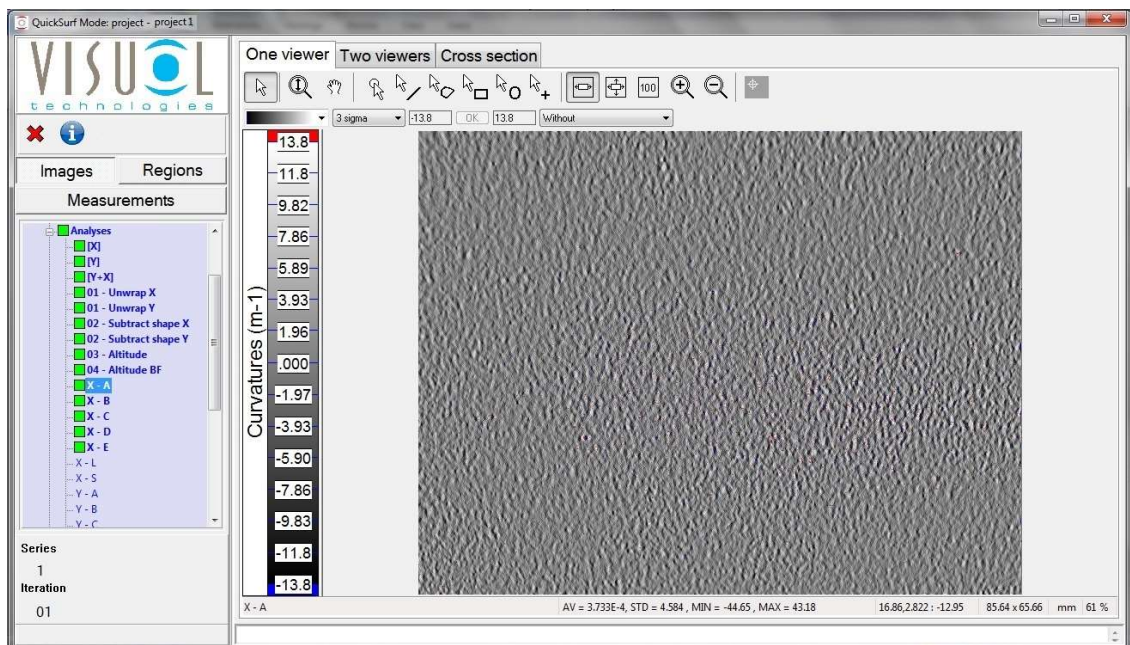
Measurements

The measurements tab contains each of the individual measurement iterations contained in a series within a project.



In the example above project 1 contains only one series named 1 containing two measurements, 01& 02.

Double clicking on the measurement number opens the measurement.

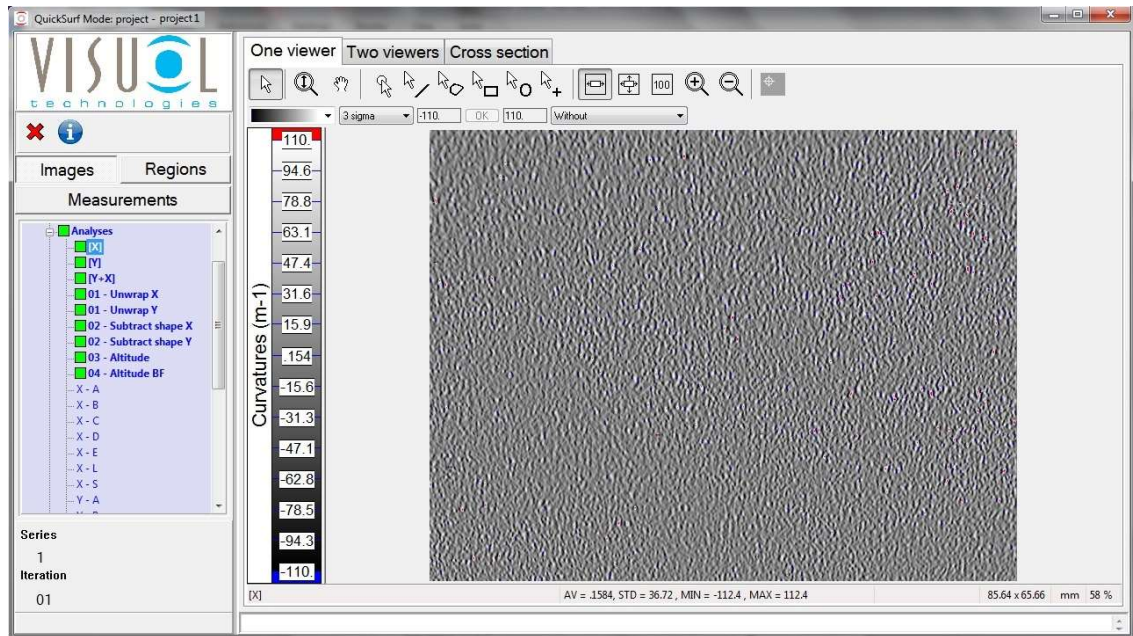


The opened image of Measurement 01, Series 1 in Project1 is shown above.

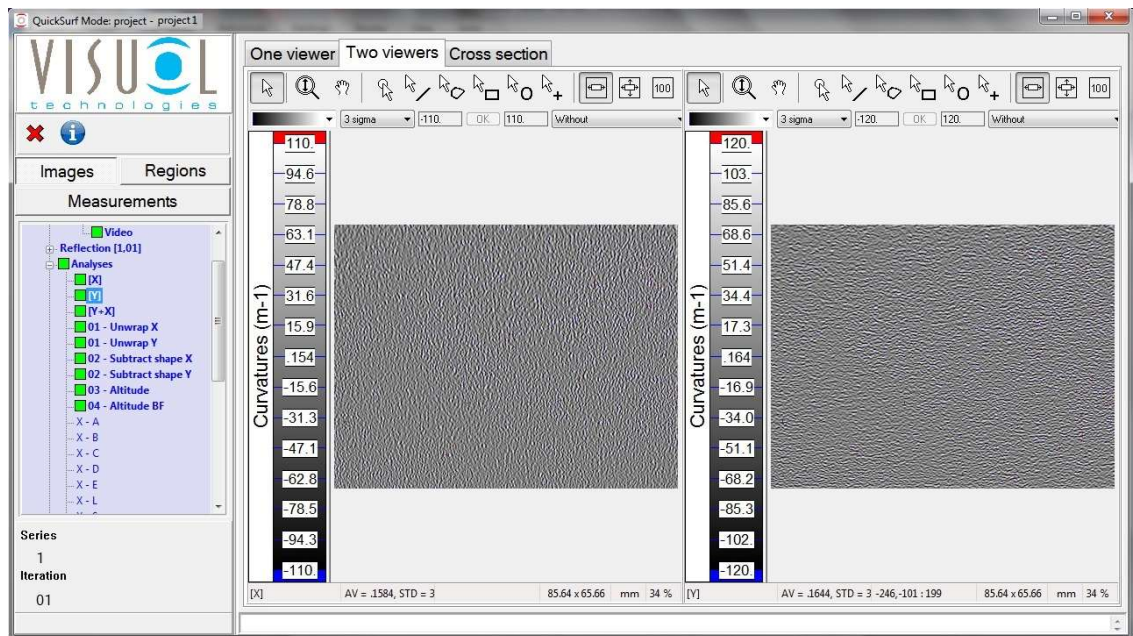
Viewer

The viewer selector allows the surface image display to be shown in three different ways:-

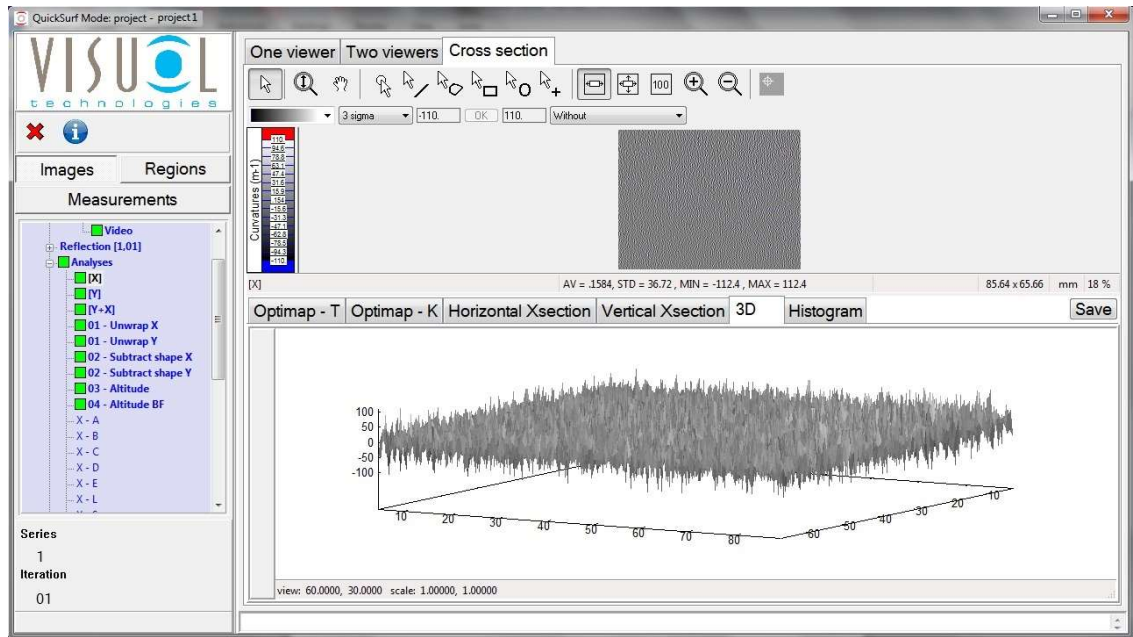
As a single view



As a dual View



Or as a Cross Sectional / 3D View

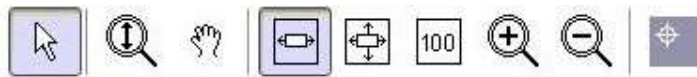


The single and dual viewer displays contain the same format in terms of viewer toolbar and colour palette. The only difference is that the dual viewer display contains two viewing screens. This useful feature allows two images to be displayed together allowing the analysis of each image side by side to evaluate curvature or texture effects which are directional.

Images in both displays can be transferred (drag and drop) to Microsoft Word for rapid reporting.

All viewer formats allow rapid full screen viewing of the image map by simply double clicking on the image itself. In full screen mode only the image map and the viewer toolbar are displayed allowing detailed examination of the image.

Viewer Toolbar









The viewer toolbar allows the displayed image to be adjusted according to user requirements



Set mouse to pointer mode

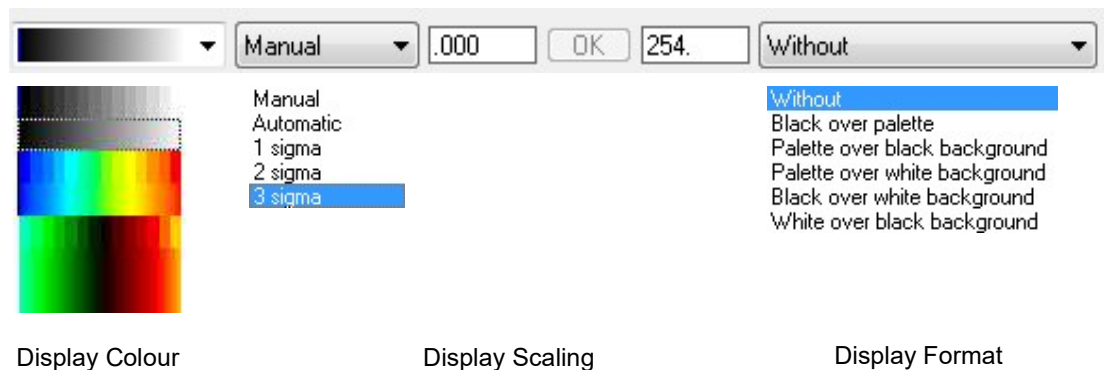


Set mouse to zoom mode

	Set mouse to image navigation mode allowing panning of the image
	Adjust image size according to viewer size
	Stretch image to cover the whole viewer
	Restore image to its original size
	Zoom In
	Zoom Out

Display Settings Toolbar

The viewer contains a display settings tool bar allowing the modification of the display for the current image.



The toolbar consists of three main sections:

- Display Colour:** A vertical color bar with a grayscale gradient at the top, followed by a rainbow spectrum, and a red-to-green gradient at the bottom.
- Display Scaling:** A dropdown menu currently set to 'Manual', a text input field containing '.000', an 'OK' button, another text input field containing '254.', and a dropdown menu currently set to 'Without'.
- Display Format:** A dropdown menu currently set to 'Without', with a list of options: 'Without', 'Black over palette', 'Palette over black background', 'Palette over white background', 'Black over white background', and 'White over black background'.

The choice of display colour and format allows the evaluation and highlighting of defects on different surface types and the upper and lower limits of the scaling selected.

Scaling values can be fixed in a number of different ways:-

- *Automatic:* the upper and lower limits correspond to the minimum and maximum values of the displayed image map
- *Manual:* the upper and lower values are set manually by the user
- *1, 2 or 3 sigma:* the scale is centered on the mean value of the map and its upper and lower values are the mean values $\pm 1, 2$ or 3 sigma. (sigma is the standard deviation of the displayed map)

One / Two Viewers Display

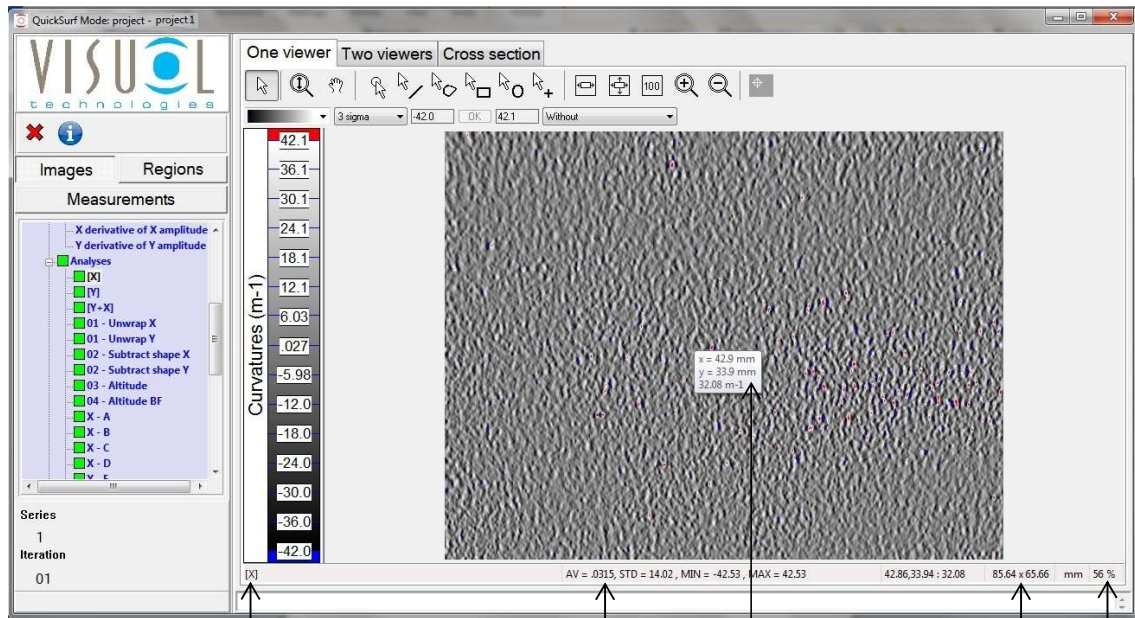


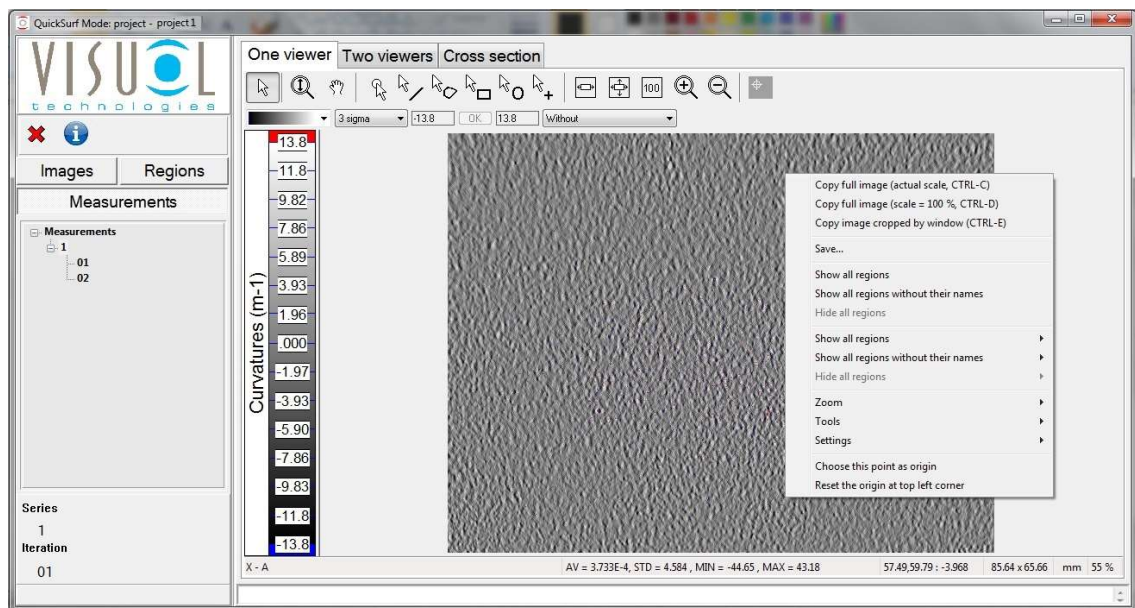
Image name
and direction

Image stats

Image
size

X, Y, Z pointer
position indicator

Zoom
level



Right clicking on the image displays a dialogue box with the following functions-

Copy full image (actual scale, CTRL-C)

Actual scale copy of the full image to the clipboard, can also be actioned using Ctrl-C

Copy full image (scale = 100%, CTRL-D)

100% scale copy of the full image to the clipboard, can also be actioned using Ctrl-D

Copy image cropped by window, CTRL-E)

Copy the full image shown in the window to the clipboard, can also be actioned using Ctrl-E

Save....

A dialogue box will be displayed asking whether the image is to be saved.

Clicking Save... opens another dialogue box requesting the location where the image is to be saved, what the filename is and in what format.

By default images are stored as Ondulo type (.res) in the Report folder of the active project. Ondulo type files can be opened using the **Files** option at the end of the main tree view as detailed later in this manual.

Images can also be saved in four other different types:-

Image file – JPEG

Image file – TIFF

Image file - PNG

Spreadsheet file – X / Y point by point data in .csv format

Show all regions

Displays all regions available in current image

Show all regions without their names

Displays all regions available in current image without region names

Hide all regions

Hides all regions in current image

Show all regions >

Displays all coloured regions available in current image

Show all regions without their names >

Displays all coloured regions available in current image without region names

Hide all regions >

Hides all coloured regions in current image

Zoom >

Accesses zoom functionality

Fit in window

Stretch to window

500%

400%

300%

200%

100%

30%

10%

Tools >

Accesses viewer toolbar functions

Settings >

Allows the configuration of the viewers display -

Display hovered point information - Show / hide on screen pointer information

Scrollbars - When in zoom mode show / hide scrollbars

Rulers - Show / hide rulers

Status bar – Show / hide lower status bar

Toolbar – Show / hide viewer toolbar

Display settings toolbar - Show / hide display settings toolbar

Indicators panel - Show / hide indicators panel (not used)

Defects panel - Show / hide defects panel (not used)

Scale - Show / hide left hand scale

Choose this point as origin >

Set current pointer position as origin i.e. $X = 0, Y = 0$

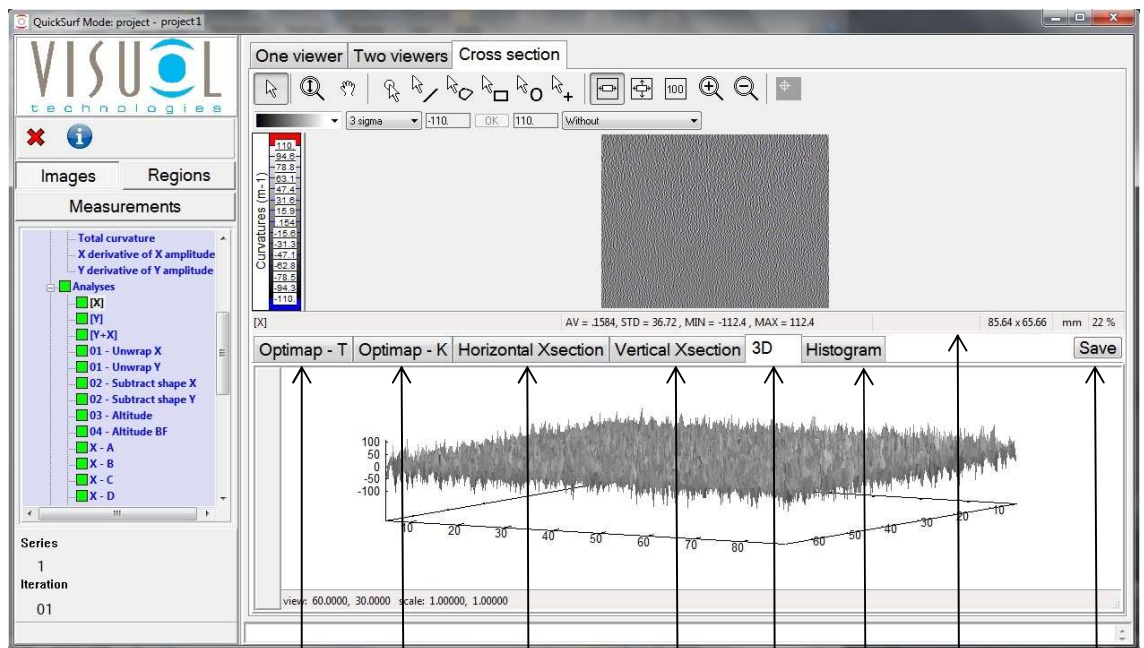
Reset the origin at top left corner >

Reset the origin to the top left hand corner of the displayed image

Cross Section Viewer Display

The cross section viewer adds a split screen mode to the single viewer allowing 3D display and rotation of the image, horizontal / vertical cross sectional views and the display of filtered image data in both curvature and texture according to the structure spectrum, $(K, Ka - Ke), (T, Ta - Te)$.

The size of both viewing areas can be adjusted according to preference by left clicking and holding the resize bar.



Texture Graph

Curvature Graph

Cross section view in X direction

Cross section view in Y direction

3D Viewer

Histogram of the image

Resize bar

Save 3D image

Texture Graph

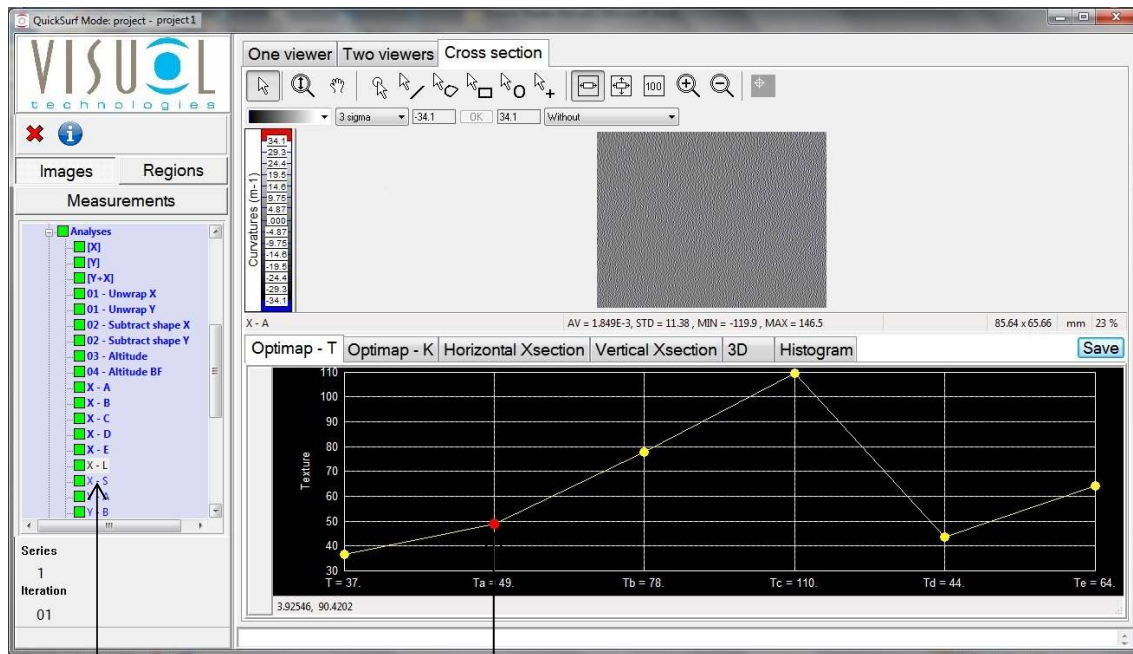
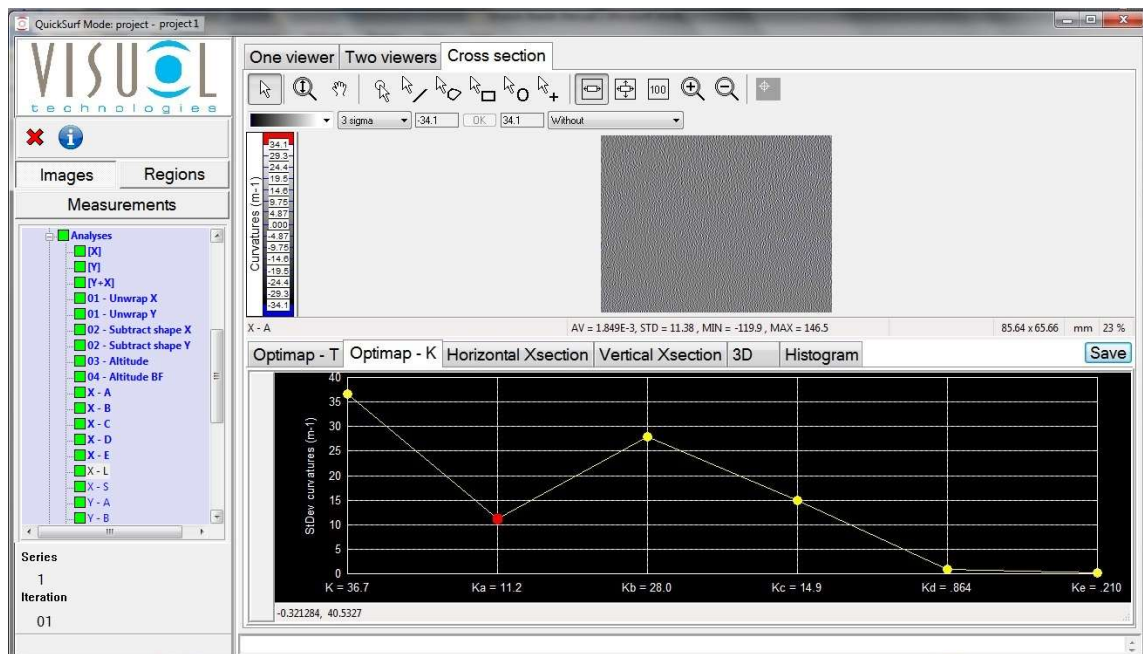


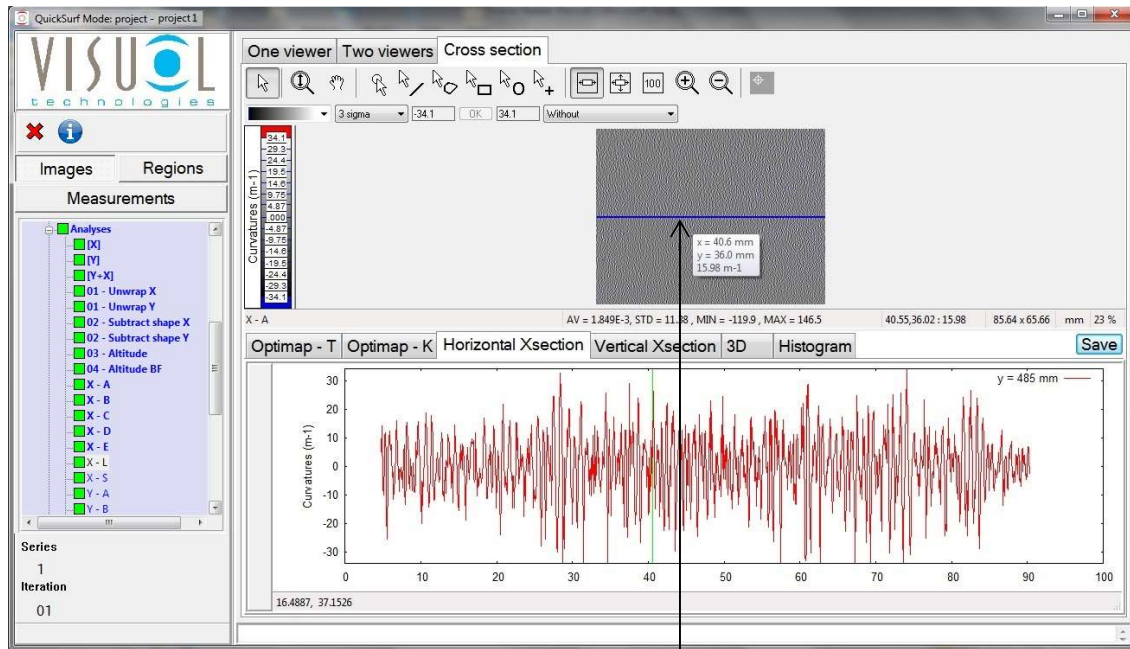
Image selector

Data point indicator

Curvature Graph

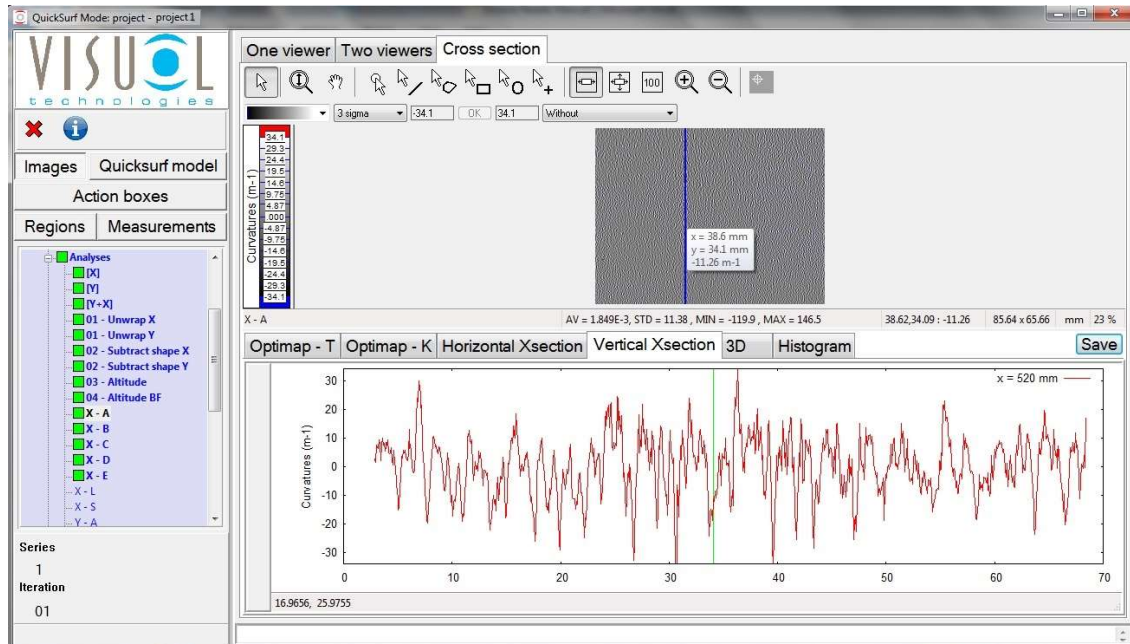


Cross section view along X

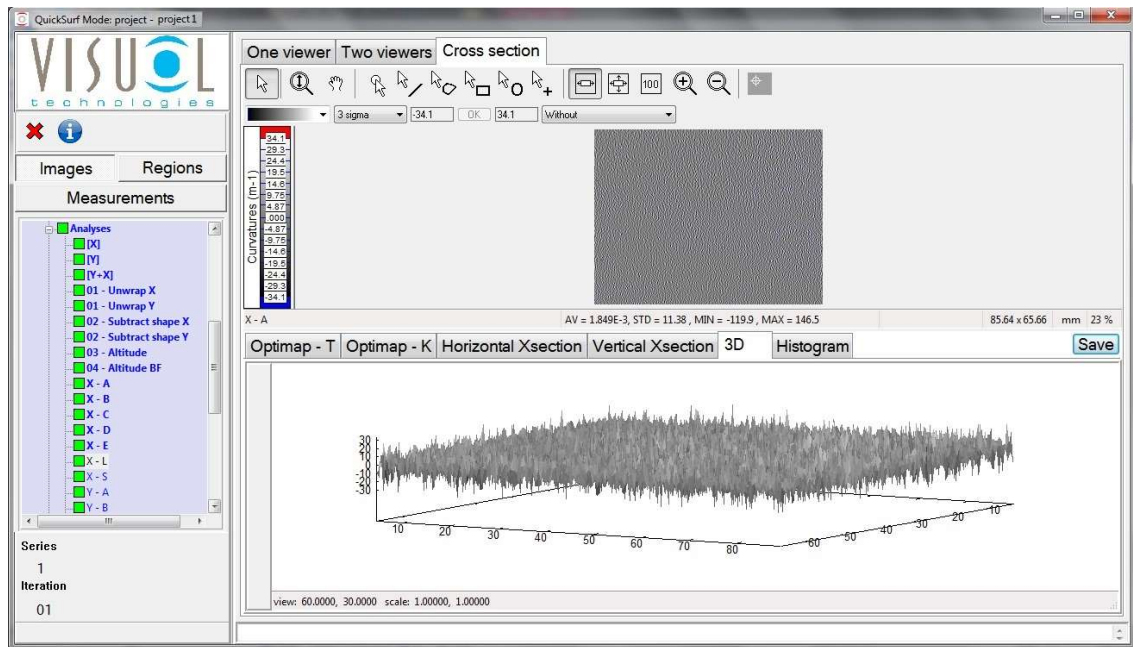


Cross section indicator

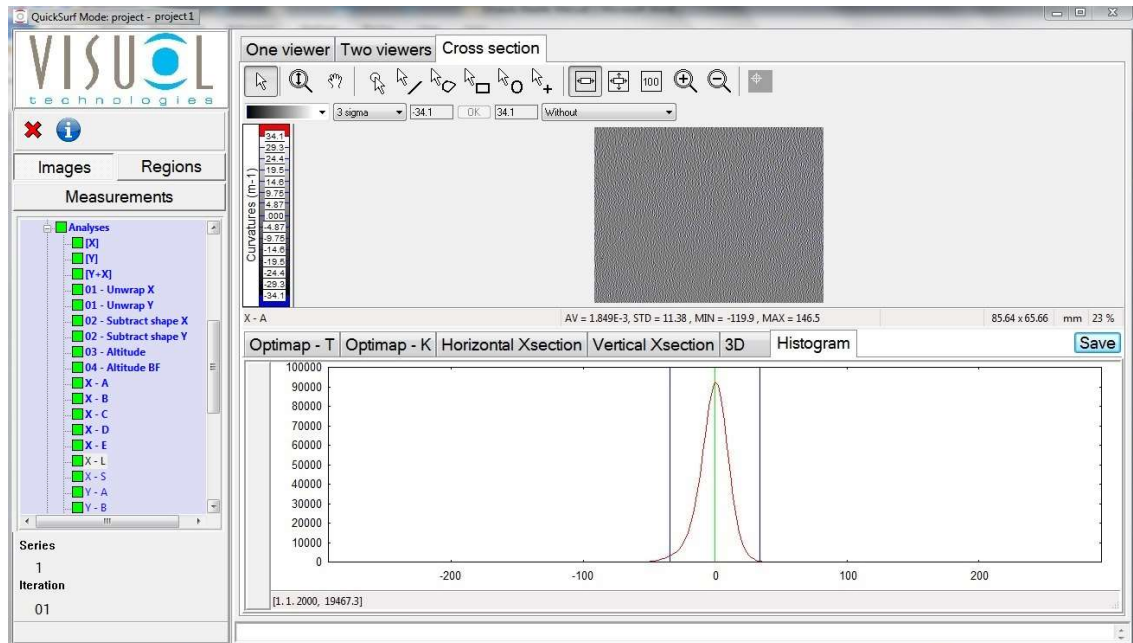
Cross section view along Y



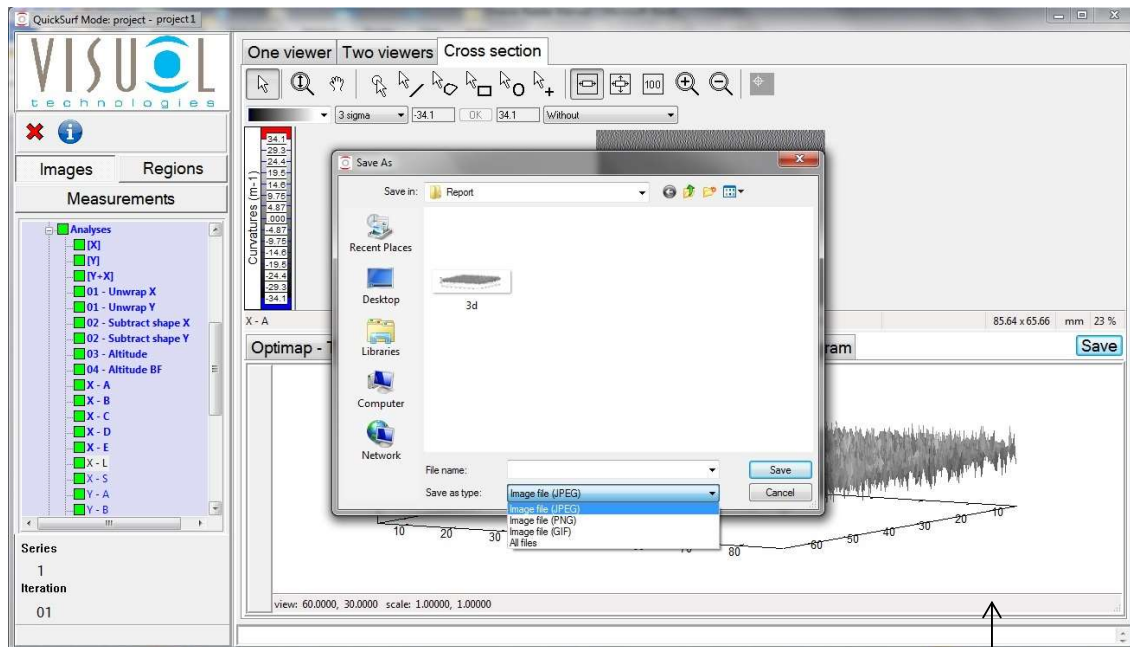
3D viewer



Histogram

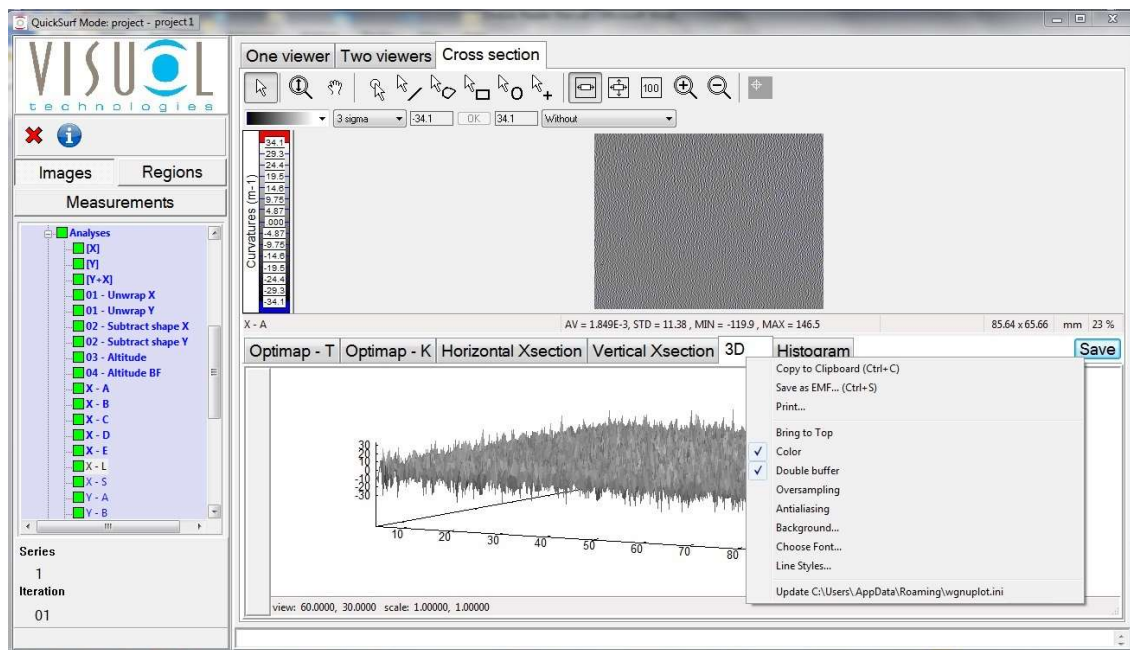


Save (as detailed on p27)



Lower
indicator
bar

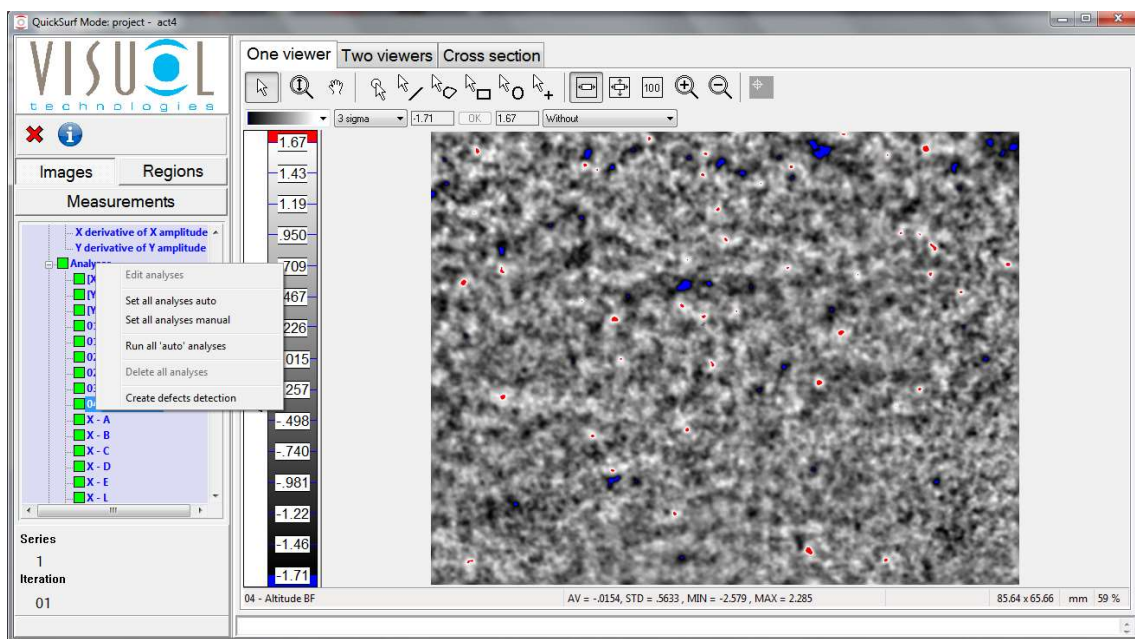
By right clicking on the lower indicator bar a dialogue box is displayed allowing configuration of the lower display area as shown below,



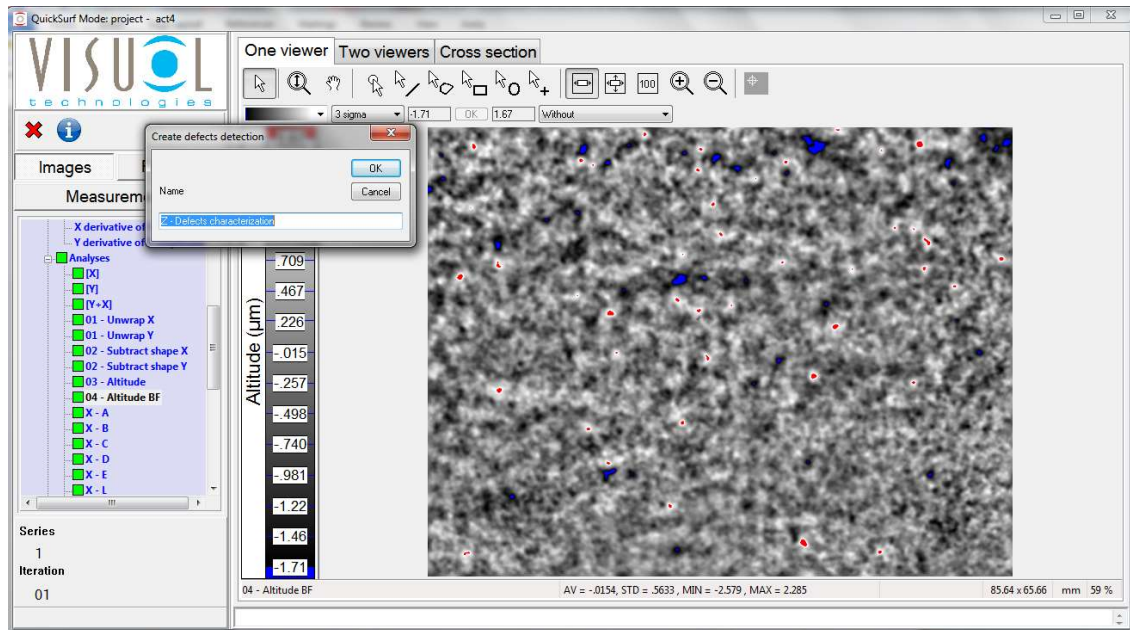
<i>Copy to Clipboard (Ctrl+C) -</i>	Copies the 3D image displayed to the clipboard
<i>Save as EMF ... (Ctrl+S) -</i>	Save image in Enhanced Metafile format
<i>Print</i>	Print the image directly to an attached printer or to pdf (if installed)
<i>Bring to top</i>	If selected brings the image to front
<i>Color</i>	Display in colour or black and white
<i>Double Buffer</i>	Increases the image refresh speed
<i>Oversampling</i>	Enable / Disable image oversampling
<i>Antialiasing</i>	Enable / Disable image antialiasing
<i>Background</i>	Set background colour
<i>Choose Font</i>	Set display font
<i>Line Styles</i>	Select line styles used
<i>Update C:*. *</i>	Updates and save Ondulo reader settings

Defects Detection

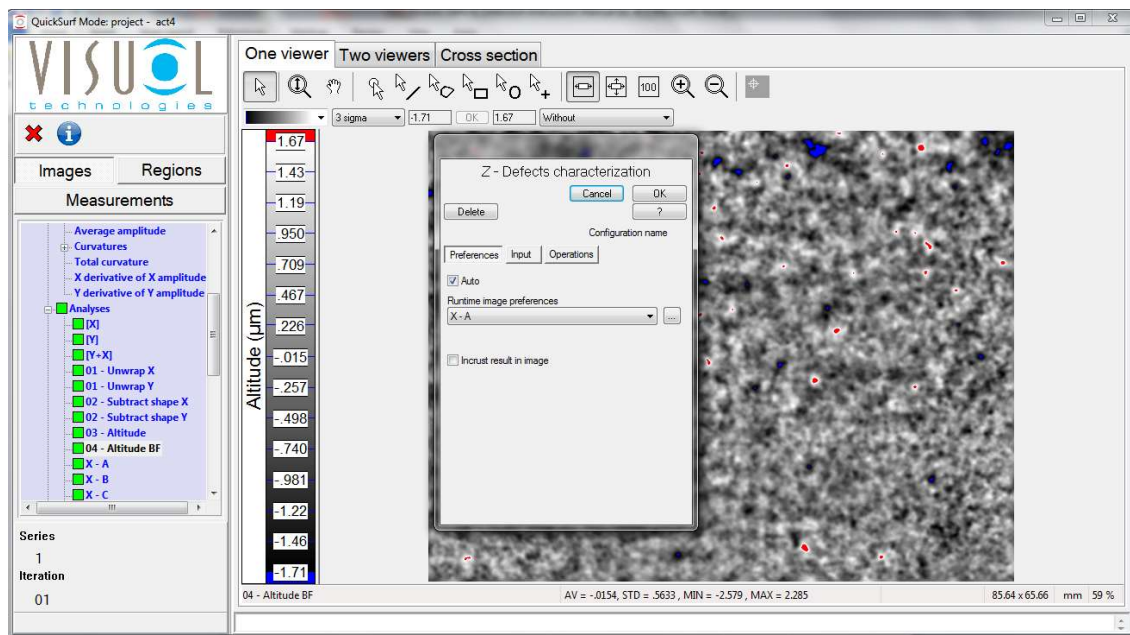
Ondulo Defects Detection Software allows advanced automatic analysis of all types of defects present on a surface measured using Optimap

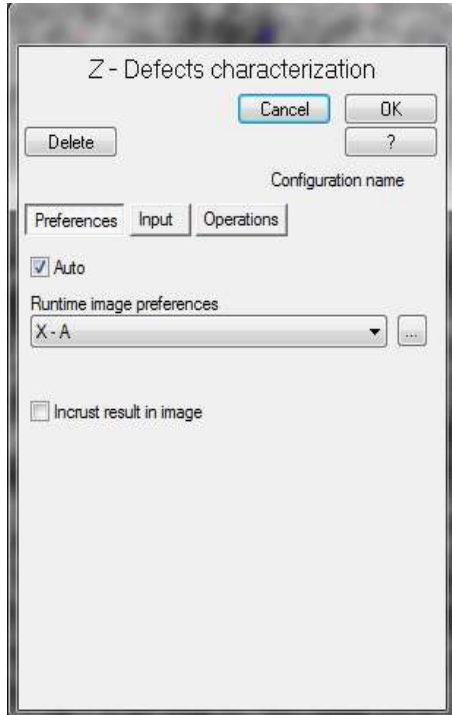


A new defects analysis can be created by clicking on the main Analysis label in the Analysis tree view. Selecting this option opens a new dialogue box as shown allowing the entry of the name of the analysis, note: all names must start with the prefix "Z –" then the name. If not entered correctly a warning dialogue box will be displayed correcting the format of the name entered.



Once entered the dialogue box will change as below allowing the entry of the defect detection parameters.





The dialogue box contains 3 tabs:

- Preferences
- Input
- Operations


Preferences tab

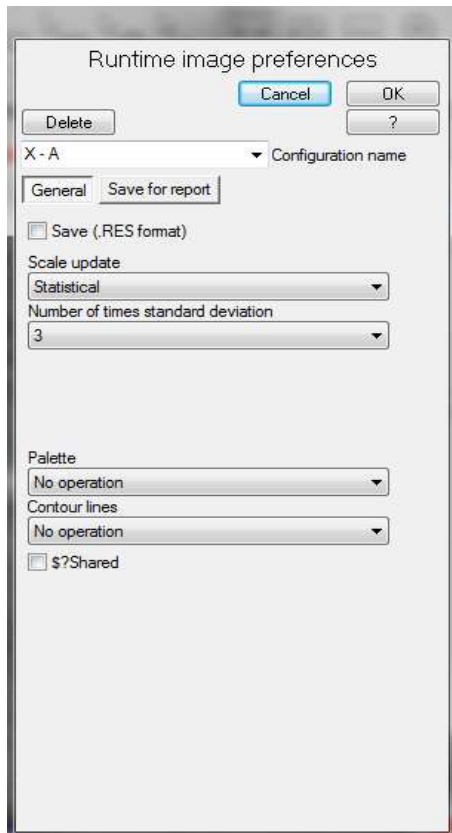
This section allows the setting of the analysed image that is displayed after processing

Auto: When set to auto the analysis is run automatically after the measurement and/or when the measurement is reopened.

Runtime image preferences: Selects how the image is displayed and saved.

Incrust result in image: Embed the original image in the background of the defects analysis.

By clicking on  in Runtime image preferences:



General tab -

Save (.RES format): Save file in .Res format. .Res is the default file extension of Ondulo files. These can be opened with the Reader software, the Detection software or by using third party software packages such as Mountains Map or Matlab.

Scale update / Number of times standard deviation: Selects how the image is displayed. Scaling can be set to automatic, manual or statistical. In automatic the limits of the scale are automatically set to the minimum and maximum values measured on the surface. In manual the minimum and maximum values can be entered, useful for comparing samples that are similar. In statistical, 3 sigma for example will display the image as average +/- 3 standard deviations.

Palette: Selects which colour the image is to be displayed, i.e. greyscale or colour.

Contour lines: Selects the background and the colour of the contour line points.

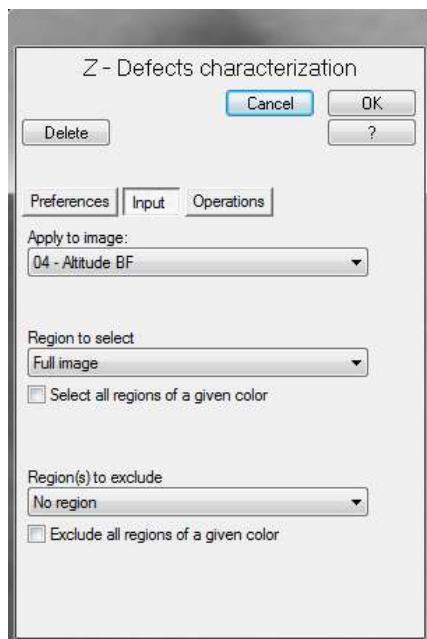
Save for report tab -

Report image elements: Allows the displayed image to be saved in a number of different formats within the project (as defined on page 27). Images can be saved individually, with or without scaling and header information, or in two separate files. Images can also be saved with any regions that have been created (as detailed on pages 19 – 21).

Each new configuration produced within the preferences tab should be renamed and saved as a new user defined configuration file for future use. This way the default configuration will not be overwritten each time.

Input tab

This section allows the setting of the input image and regions required for the analysis.



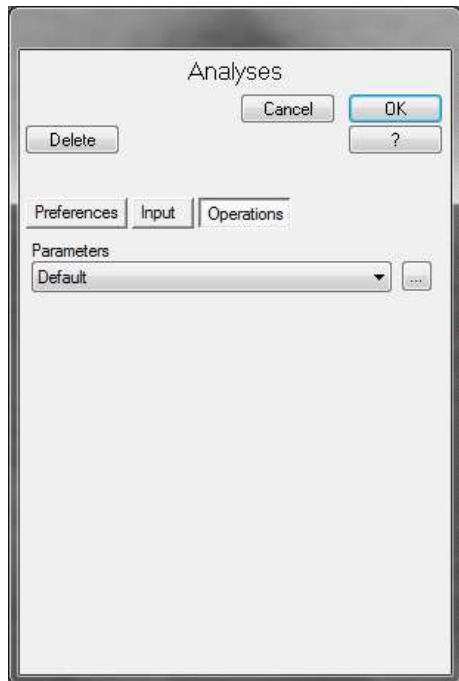
Apply to image: Dropdown menu allowing the selection of the input image required for processing

Region to select: Dropdown menu allowing the selection of regions to include during processing. These can be selected individually by name or all of a given colour.


Region(s) to exclude: Dropdown menu allowing the selection of regions to exclude during processing. These can be selected individually by name or all of a given colour.

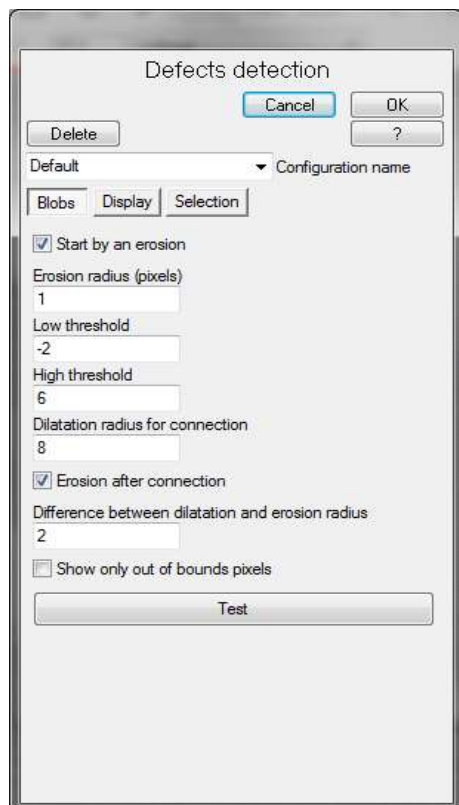
Operations tab

This section allows the setting and saving of the defects detection configuration required for the analysis.



Each new configuration produced within the operations tab should be renamed and saved as a new user defined configuration file for future use. This way the default configuration will not be overwritten each time.

To enter a new configuration click on the  button in Parameters:

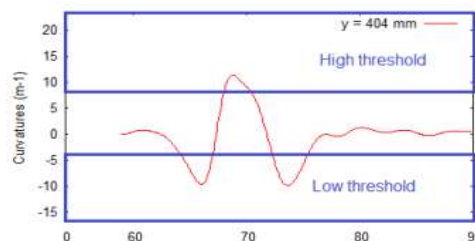


The screen will change to display the parameter entry box. This dialogue box contains 3 tabs:

- Blobs
- Display
- Selection

Blobs Tab

Blobs are areas on the surface detected outside the boundaries of the threshold settings.



Low threshold: Set this value to display all defect pixels which are below the value set.

High threshold: Set this value to display all defect pixels which are above the value set.

Erosion radius (pixels): Erosion is used to reduce the size of defects detected. Depending on the size of the defect under evaluation this value can be set to optimize the erosion process. Increasing the value increases the erosion radius and conversely decreasing reduces the erosion radius.

Dilation radius for connection: Dilation is the opposite operation to erosion. Due to the effects of measurement noise, pixels belonging to the same defect may be disconnected, i.e. after thresholding they may be separated by masked (green) areas. Connection is used to define the maximum distance (radius) that can separate pixels within a defect. Therefore all isolated pixels separated by a distance lower than this radius will be seen as belonging to the same defect.

Difference between dilation and erosion radius: As an example to understand the process more clearly it may be interesting to thin out blobs using erosion. Defects may then appear roughly of the size they really are (a dilation followed by an erosion is called a closure, as it is an operation that tends to fill holes and bays). However, it is possible to introduce disconnections again within single defects.

An example -

After dilation:



After erosion:



Connection is made using the dilation operation, this replaces every non-masked pixel by a circle of set radius.

A typical process would be as follows -

1. There are some points near to each other but all are separated and it appears that there are a lot of "defects".
2. A dilation is performed to connect the points which are near together. Now it can be seen that there are 4 principal defects (3 green, 1 white)
3. An erosion is performed to thin the blobs. Now 4 defects can be seen which are the same as those that are observed.

An example:

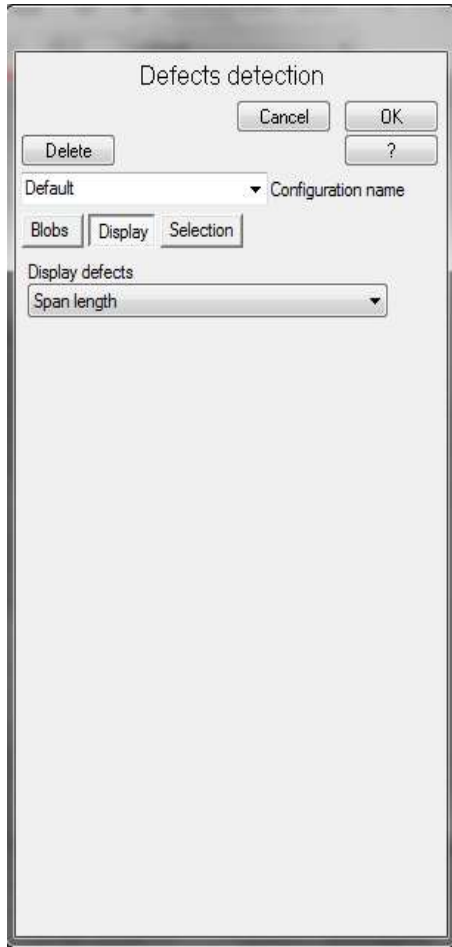
Before dilation:



After dilation:



The dilation operation connects the blobs together if they are near.



Display Tab

This tab allows the selection of the scale that is displayed for defects detection.

The following scales can be selected -

Surface - The surface area of the defect in mm²

Weighted surface - The weighted sum of each defect pixel

Aspect ratio - The aspect ratio of the defect i.e. the ratio of height and width a value of 1.00 indicating the defect is circular

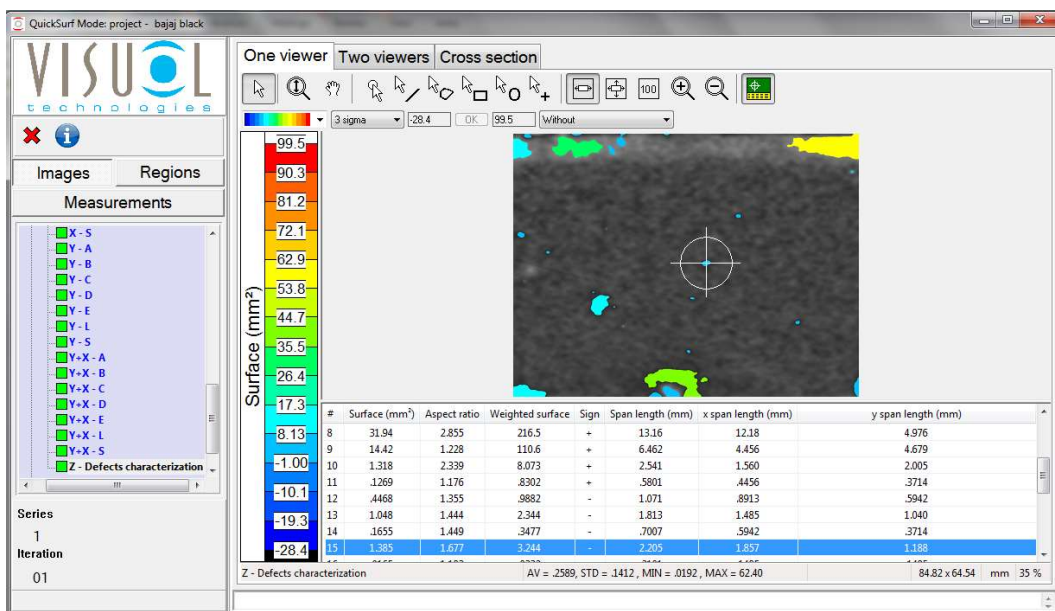
Sign - The Sign either positive or negative, indicating the defect goes inwards or outwards on the surface

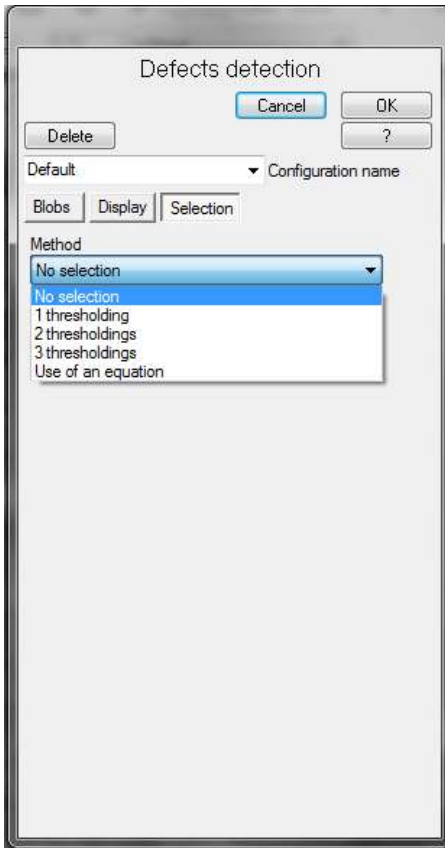
Span length - The span length of the defect; the maximum length of the defect

x / y span lengths - The X and the Y mid lengths of the defect

Number - The number of defects detected on the surface

So by changing the display to “Surface” the scale changes on the processed analysis screen as below –





Selection Tab

This tab allows the setting of further selection criteria's via upper and lower thresholds values applied to the same parameters as described on page 38 / 39. Up to three additional thresholds can be configured.

Or an equation can be used from an external file for the selection.

This selection process should only be configured after the defect detection analysis has been run using the configuration in the blobs tab.

This additional selection feature is very useful for identifying defects of a particular type, shape and size. For example if an analysis is required to only identify defects on the surface that are circular then a thresholding can be configured to only display those defects having an aspect ratio of 1.

On the other hand for scratch identification higher aspect ratios could be used.