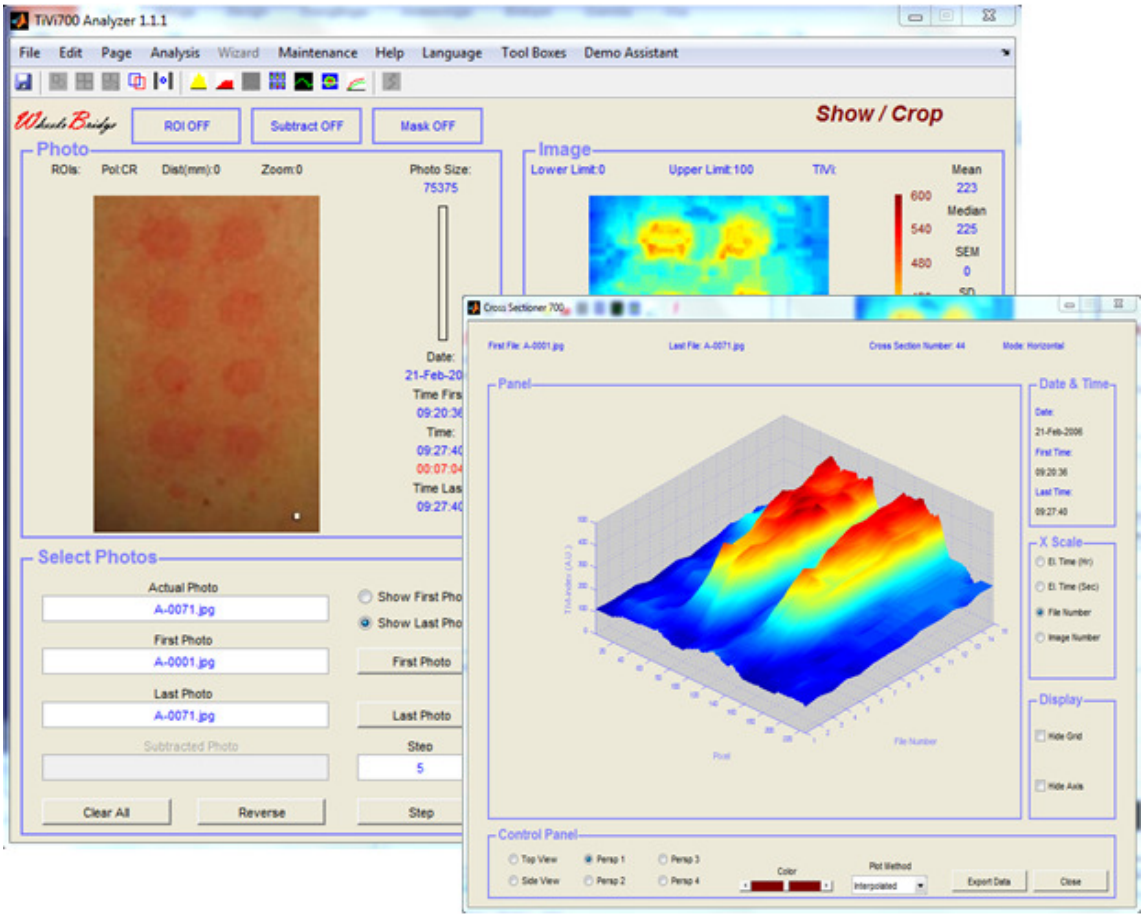
WheelsBridge



TiVi700 Analyzer Main Manual

User Manual 1.5
February 2019

TISSUE VIABILITY IMAGER

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Part 1 – Introduction

The **TiVi700 Analyzer** is the analysis part of the **TiVi700 Tissue Viability Imaging** system. The **TiVi700 Analyzer** analysis sequences of photos and creates a TiVi image mapping the skin red blood cells concentration for each photo. The **TiVi 700 Analyzer** is composed of two main pages – the **Show/Crop** page and the **Movie/View** page – described in further detail below.

The TiVi700 software runs on 64 Bit computers only.

Part 2 – Menu Items

1. The **File** menu.
    a. **Camera** – Opens the **TiVi700 Camera** software for capturing of TiVi photos. The **TiVi700 Camera** software is further described in the **TiVi700 Camera** manual.

    b. **Open A Photo** – opens a new **Photo** in the **Photo** window. This window can be used as a reference to the **Photo** and **Image** being displayed in the **TiVi700** main window. Multiple **Photo** windows can be kept open simultaneously, moved to outside the main window and rescaled to a suitable size. To rescale an open window place the mouse pointer at the border of the window (the pointer changes to a double arrow), press the left mouse button and drag the mouse to a new position.

    c. **Open TiVi Chart** - opens a **TiVi Chart** saved from inside the TiVi **Chart window.**

d. **Projects → New TiVi Project –** opens a new **TiVi Project**.

e. **Projects → Open TiVi Project –** opens an existing **TiVi Project**.

f. **Save As** – for saving the actual sequence of **Photos** as displayed in the **TiVi700 Analyzer** window. This command is useful for saving the sequence of **Photos** in a different folder or under a new name. Saving regions of interest (**ROIs)** is done by use of the **Crop & Save** command in the **Crop Image**s frame. All relevant parameter settings are saved together with the **Photos** in such a way that the next time the **Photos** are loaded, the associated **TiVi Images** will be displayed under the view angle and with the same mask settings, upper and lower limit as when they were stored. This is equivalent to saving the actual **Mask** settings of the **Images**.

g. **Load ROIs** – loads a selected set of **ROIs**. This set of **ROIs** is accepted only if the size of the actual **photo** is the same as the **photo** in which the **ROIs** were originally generated.

h. **Save ROIs** – saves the present set of **ROIs** to file.

i. **Photo resolution** – opens a new window that allows the user to save a sequence of the actual photos at lower resolution than the original photos. Working with the sequence of photos at lower resolution speeds up the data analysis procedures and is useful when a first overview of data is made. In the **Photo Resolution** window the user can set the desired resolution of the photos and save these photos to file under a new name.

j. **Photo rotation** – opens a new window that allows the user to rotate the photos a selected number of degrees and save a sequence of actual photos rotated to this degree. These rotated photos can be saved to file under a new name.

k. **TiVi Pre-Processor –** opens a new window that allows the user to align the object in the individual photo before analysis. For further information please see the separate **TiVi Pre-Processor** manual.

l. **Export Image –** exports the raw data associated with the **Image** displayed to a file that can be read by **Excel®** or by **MATLAB®** for further processing**.** Select if the entire sequence of photos or just the actual image are to be saved. Note that the **Excel®** decimal delimiter must be a dot and not a comma.

m. **Exit** – opens a dialog window that prompts the user to confirm the close of the **TiVi700 Analyzer** window.

2. The **Edit** menu.

a. **Activate Pigm Comp** – allows the user to suppress the influence of pigmented spots on the TiVi-image. Fine-tuning is made by the **Pigmentation Compensation** on slider.

b. **Deactivate Pigm Comp** – deactivates the pigmentation compensation settings.

c. **Copy Photo** – opens a **Photo** window from which the **Photo** and **Photo Data** can be copied to the **Clipboard**.

d. **Copy Image** – opens an **Image** window from which the **Image** and **Image Data** can be copied to the **Clipboard**.

e. **Circle ROI / Rect ROI** - sets the region of interest to circular or rectangular shape.

f. **Freehand ROI** – draws ROI by use of the mouse to user-selected shape.

g. **Common ROI** – all ROI operations are applied to all photos in the sequence.

h. **Individual ROI – No Lock on** – when first drawn, the ROI is applied to all photos in the sequence. When a ROI is moved or stretched, this maneuvre applies only to the ROI in the actual Photo. By this arrangement a slight movement of the object in one or more photos can be compensated for by moving the ROI(s) to the correct position. When a ROIs is removed it is removed from all photos in the sequence. The individual ROIs are stored in a 3-dimensional matrix saving the actual photo file number, the ROI number and the ROI coordinates. When a ROI is saved, this matrix is saved with a prefix identical to the actual photo prefix to which a user selected sub-prefix is added.

i. **Individual ROI – Lock on White Spot –** to keep the ROIs locked on specific positions on the target tissue even if the target is moving in relation to the camera. Start with placing a round white marker (a paper clip with a diameter of about 5 mm will do well) on the target tissue before capturing the photos. In the analysis – with the setting to lock on to the white spot – the system automatically finds the brightest spot and uses this as an anchor point for the ROIs in each photo. Draw ROIs and then click the Automatic button to scan through the photos. The ROIs should now appear locked in relation to the white spot in the photos. This feature is particularly useful when making ROI analysis on moving targets and assists in calculating the average ROI values from the same anatomical sites even though the target position may have changed in relation to the camera.

j. **Adjust ROIs –** sets the size of all **ROIs** to the size of the last set (white) **ROI**. The upper left corner position remains unchanged in all **ROIs**.

k. **Set ROI –** opens the **ROI** setting window from which it is possible to manually set the upper left and lower right coordinates of the last selected (white) **ROI**.

l. ROI Naming – use to give every ROI a unique name.

m. **Remove Selected Area** – to remove areas selected by the ROIs from the photo. Draw ROIs around sections of the photo that is to be removed. Then click **Remove Selected Area** in the **Edit** pull-down menu. The new photos are saved in the folder RSA (Remove Selected Area) located in the folder of the

original photos. The new photos are given the prefix "RSA" followed by their original name. These new photos can be treated as standard TiVi-photos and when they are uploaded the selected areas are displayed in turquoise colour in the photo and as background in the corresponding TiVi image. This feature is useful for eliminating areas in the original photos that may distort the result such as a red spot characterizing an injection trauma at studies of the vaso-active response to an injected substance as wells as for elimination artificially coloured skin. This function operates also in cascade, i.e. the generated RSA photo can be used as the original photo to further remove new selected areas.

3. The **Page** Menu.

    a. **Crop Images** – to set the system to display the **Step Through** and the **Crop Images** frames.

    b. **Movie** – to set the system to display the **Movie** and the **View** frames.

4. The **Analysis** Menu

    a. **Single Image** – displays the **Single Image** window.

    b. **Group of Images** – displays the **Group of Images** window.

    c. **Curve Tracker** – displays the **Curve Tracker** window.

    d. **Gallery** – displays the **Gallery** window.

    e. **Image Slicer** – displays the **Image Slicer** window.

    f. **Cross Sectioner** – displays the **Cross Sectioner** window.

    g. **Profiler** – displays the **Profiler** window.

5. The **Wizard** Menu – to display the Wizard for automatic analysis of TiVi data.

6. The **DropData** Menu

    a. **Data to Sheet** – to open a **DropData** window for inserting image data into a spread-sheet.

    b. **Organizer** – to open the Organizer table holding test subject data.

7. The **Maintenance** Menu.

    a. **Window Size** – changes the **TiVi700 Analyzer** window size between **Small, Large** and **Wide** Window (available only if the computer display is wide screen and high resolution).

b. **Generate Subfolders / No Subfolder Generation** – when many photos are generated as a result of image processing procedures, all photos can be stored in separate folders with the same name as the **Prefix** of the photo name. This feature helps to sort the individual photos and keep them separated. Click the **Maintenance** pull-down menu reading **No Sub-folder generation** to turn off this feature and click **Generate Sub-folders** to turn the feature on again.

8. The **Help** Menu.

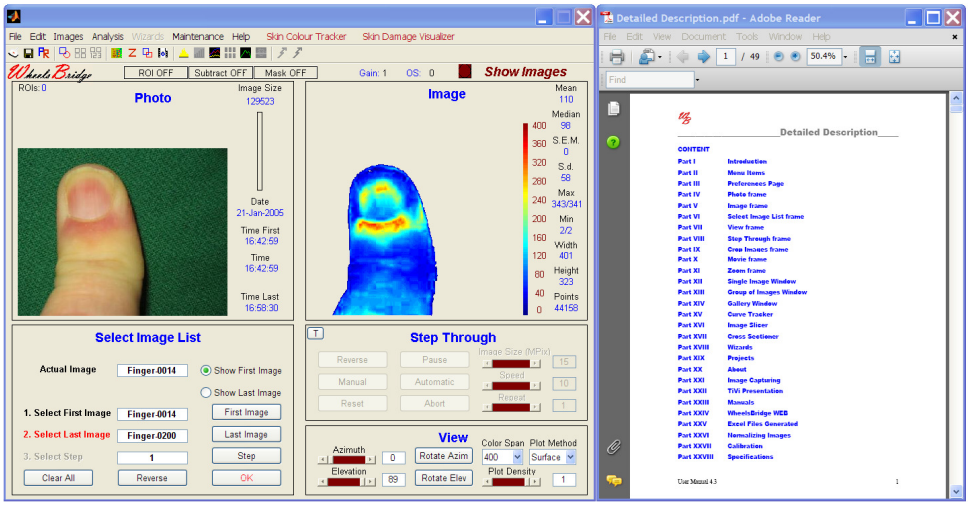
a. **About –** displays the **About** window with information about the software version and WheelsBridge AB.

b. **License –** displays the software license agreement.

c. **Manuals –** electronic copies of the **Quick Reference Manual,** the **Main Manual** and the **Pre-Processor Manual**.

i. Click e.g. the **Main Manual**. This manual will now open inside the **Abode PDF-Reader** (this assumes that the **Abode PDFReader** is installed). The **Abode PDFReader** can be down-loaded free of charge from http://www.adobe.com).

ii. Diminish the **Adobe Acrobate Standard** window so both this window and the **TiVi700 Analyzer** window are simultaneously visible on the screen.



iii. If you for example want to retrieve information about how the **First Photo** button works, select Edit→ Find, print "First Image" in the edit box and click **Enter** on the computer keyboard.

iv. To find the next "**First Photo"** position in the text, click the right arrow next to the edit box.

v. Click "X" to hide the edit text box**.**

d. **TiVi700 Presentation** – an overview presentation of the **TiVi** technology.

e. **Demo Assistant** – a full explanation of the *Demo Assistant* features**.**

d. **Product Sheet** – displays detailed TiVi product sheet in pdf-format.

e. **WheelsBridge WEB** – a direct link to the WheelsBridge WEB-site.

f. **ToolTips** –displays (ON) or hides (OFF) the tooltips associated with the different controls and displays.

g. **Patents** – lists TiVi patent numbers

9. The **Language** Menu - to set the actual language. This information is stored between sessions and is automatically retrieved when a new session is initiated.

10. The **Tool Boxes** Menu – to start individual toolboxes (optional).

11. The **Demo Assistant** Menu – to start the interactive **Demo Assistance** guiding the User on how to use the different features of the **TiVi700 Analyzer**,

Part 3 - Photo frame

1. The **Photo** - loaded from file or being the result of a **Show ROI** click button.

2. The **Photo Size** (in pixels) is displayed next to the **Photo**.

3. The **Actual Photo Indicator** indicates in blue color the relative number of the **Photo** in the sequence that is currently displayed.

4. **Date** indicates the date when the photo was captured.

5. **Time First** indicates the time when the first **Photo** of the sequence was captured.

6. **Time** indicates the time when the currently displayed **Photo** was captured as well as the **Elapsed Time** from when the **First Photo** was captured.

7. **Time Last** indicates the time when the last **Photo** of the sequence was captured.

8. **ROIs** displays the number of active regions of interest.

9. Information about **Polarization Mode**, **Distance** to object and **Zoom** mode as stored with the photo.

10. When a region of interest (ROI) is drawn the **Distance** (in pixels) between two diametric corners of the ROI is displayed below the **TiVi-value**.

Part 4 - Image frame

1. The **Image** – calculated by the ***TiVi700*** algorithm or being the result of a **Show ROI** button click.

2. The **Data Values** for the displayed **Image** are listed to the right of the **Image**. **Data Values** representing the entire **Image** or a **ROI** are listed in blue color, while **Data Values** representing areas selected with the **Upper Limit** and **Lower Limit** sliders are listed in red color. **Data Values** representing a **Subtraction Image** are displayed in turquoise color, while **Data Values** representing a **Subtraction Image** with values within the **Lower** and **Upper Limit** are presented in gray color. Double presentation (x/y) for Mean indicates mean value including background (x) and only background (y). Double presentation (x/y) for Max and Min indicates the highest/lowest value (x) respectively the median value of the 10 highest/lowest values. The latter is used by the system in **Mask** calculations in order to avoid the influence of single extreme values.

3. Following selection made by the **Lower** and **Upper Limit** sliders, the limits (in percentage) are displayed above the **Image**.

4. The **TiVi-value** of the point at which the pointer is pointing in the **Photo** or **Image**, is continuously updated and displayed.

5. The median RGB value triplet for the actual photo displayed in the **Photo Frame**. For a sequence of photos, the corresponding RGB value triplets can be exported to the **Group Of Images** window where they can be displayed in a separate colour space window and exported to an Excel® document.

6. The **Color Bar** is displayed to the right of the **Image** and reflects the setting of the **Color Span**.

Part 5 - Select Photos Frame

1. **First Photo button –** to select the **First Photo** file of the sequence of **Photos** to be investigated from the files listed in the **Open Dialog Box**. The file name is displayed in the associated **First Photo** edit box. By default the **Last Photo** is automatically selected as the last photo in the consecutive sequence. The **Last Photo** of the sequence is displayed.

2. **Last Photo button** – to select the **Last Photo** file of the sequence of **Photos** to be investigated from the files listed in the **Open Dialog Box**. The file name is displayed in the associated **Actual Photo** edit box.

3. **Step –** to select the step in the **Photo** sequence to be loaded. If for example the **Photos** are stored in files with names F-1000, F-1001….F-1020, setting **Step** to 5 loads **Photo** data for the files F-1000, F-1005, F-1010, F-1015 and F-1020. The value is selected by repeatedly clicking the **Ste**p button.

4. **Reverse –** reverses the order of updating **Step** when the **Step** button is successively clicked. The button name toggles between **Reverse** and **Forward**.

5. **Clear All** – clears the **Photo** and **Image** frames and prepares the system for accepting new **Photos**.

6. **Show First Photo** and **Show Last Photo –** by clicking one of these radio-buttons, the first or last **Photo** and **Image** pair to be displayed can be selected.

7. **Actual Photo** box – shows the name of the **Photo** file currently displayed. To directly display a specific **Photo** in a selected sequence, print its name in the **Actual Photo** edit box and press the **Enter** button on the computer keyboard.

8. When the system is in **Subtraction** mode, the name of the file representing the **Image** to be subtracted is displayed in the **Subtract Photo** edit box.

Part 6 - Step Through Frame

1. **Manual –** by successively clicking this button, the **Photos** and **Images** are displayed in their respective frame, while the actual file name is shown in the **Actual Photo** edit box.

2. **Reverse -** changes the order in which the **Photos** and **Images** are displayed when successively clicking the **Manual** button. The button name toggles between **Reverse** and **Forward**.

3. **Reset** – displays the **First Photo** and **First Image**.

4. **Delay (sec) –** dragging the slider to a new position sets a new **Speed**, as displayed in the **Edit** box, at which the **Image** sequence following clicking **Automatic** is presented. Keeping the pointer over the leftmost or rightmost arrow in the slider, with the left mouse button down, continuously moves the slider while the **Edit** box is updated to a new **Speed** setting. Alternatively print a new value in the **Edit** box and press **Enter**.

5. **Automatic** – clicking this button makes the system step through the **Photo** sequence at a speed set by **Delay.** Activating **Automatic** enables the **Pause** and **Abort** buttons.

6. **Pause** – clicking this button while in **Automatic** mode, halts the **Step Through** procedure and waits for the button, now labeled **Continue**, to be clicked again.

7. **Abort** – clicking this button while in **Automatic** mode, aborts the **Step Through** procedure.

8. **Comments** – opens the word pad associated with the actual photo / image displayed for further editing. When the edit process is finished click the **Save & Close** button in the **Comments 700** window to save the edited text as meta data linked to the actual photo.

9. **Color Span** – for setting the color scale of the displayed image, without changing the actual data values. The color scale end-points are indicated in blue (lowest value) and red (highest value).

Part 7 - Crop Images frame

1. **Show ROI –** after having selected a **Region of Interest (ROI)**, using the following procedure

   - Place the pointer within the **Photo** or the **Image** area in the upper left corner of the **ROI** to be generated (if the **ROI** is to be generated in the **Image** and this is not displayed in **Top View** mode (azimuth = 0 and elevation = 90) the User is prompted to place the system in **Top View** mode – click **OK** in the **Warning** window to proceed)**,**

   - Move the pointer to the lower right corner of the **ROI**, while keeping the left mouse button pressed,

   - Outline the **ROI** by releasing the left mouse button,

   defines and outlines a **ROI**.

   The position of any **ROI** can be changed by the following procedure:

   When the pointer is moved over the upper left or lower right corner of a **ROI** the pointer changes shape from arrow to double arrow. When the pointer is indicated by a double arrow, the **ROI** shape can be changed by moving the pointer by use of the mouse with the left mouse button pressed. In **Common ROI** mode these changes are applied to all photos in the sequence. In **Individual ROI** mode, these changes are applied only to the actual photo.

   When the pointer is moved over the centre of a **ROI**, the pointer changes shape from arrow to four-headed arrow. When the pointer is indicated by a four-headed arrow, the **ROI** can be moved to a new position (without changing its shape) by moving the pointer by use of the mouse with the left mouse button pressed. In **Common ROI** mode these changes are applied to all photos in the sequence. In **Individual ROI** mode, these changes are applied only to the actual photo.

   When the pointer is positioned over the centre of a **ROI** as indicated by a four-headed arrow, clicking the left mouse button causes the **Erase ROI** window to

open. If the **Yes** button is clicked the actual **ROI** is erased in all photos and the remaining **ROIs** are re-numbered and re-drawn.

The actual number of **ROIs** is indicated by the **ROIs** indicator in the upper left corner of the **Photo Frame**. This number should always be the same as the number of **ROIs** displayed in the **Photo**. If not, click the **Refresh** button.

Note that a new **ROI** can also be outlined in the **Image**, but its border is always indicated in the **Photo**.

Switching between rectangular and circular **ROIs** is made by clicking **Circle ROI** or **Rect ROI** in the **Edit** pull-down menu.

The last drawn (white) **ROI** can now be displayed by clicking the **Show ROI** button. Again clicking the same button, now labeled **Undo Show ROI**, returns the system to its original mode. If new **ROIs** are successively generated the latest generated **ROI** is always displayed in white color while other **ROI**s are displayed in different colors so the **ROIs** can be easily identified. Clicking the **Refresh** button clears the **Photo** from **ROI** layouts. The **ROIs** can be drawn either in the **Photo** or in the **Image**.

By use of **Adjust ROI** in the **Edit** pull-down menu, the size of all ROIs can be made identical to the last **ROI** generated (white outline). The upper left corner of all **ROIs** is kept at the original position.

The coordinates of the upper left and lower right corner positions of the last **ROI** generated (white) can be set manually from the **ROI700setting** window opened by the **Set ROI** command in the **Edit** pull-down menu.

Provided at least one **ROI** exists, more **ROIs** of the same size can be automatically generated by placing the pointer at the upper left corner of the **ROI** to be generated and then clicking the left mouse button.

2. **Crop & Save** – with the system in the **Show ROI** mode, clicking the **Crop & Save** button, opens the **Save As** dialog box. Select a folder (or alternatively generate a new folder) and a ***file name*** and click the **Save** button to save the sequence of (cropped) **Photos**. The saved sequence of cropped **Photos** adds the ***file name*** as a prefix to the old file name. All relevant parameter settings are saved together with the cropped **Photos** in such a way that the next time the (cropped) **Photos** are loaded, they will be displayed under the view angle they were stored. Furthermore **Upper** and **Lower Limits** are saved with the **Photos** so the actual threshold settings are retrieved. This is equivalent to saving the actual **Mask** settings of the **Images**.

3. **Overlay** – after having selected upper and lower threshold by way of the **Upper Limit** and the **Lower Limit** slider, clicking the **Overlay** button, displays the actual reduced image areas superimposed on the photo, the latter now displayed in gray scale. When the **Automatic** button is clicked the selected image area is displayed superimposed throughout the entire photo sequence.

4. **Subtract** – click this button to subtract the **Actual Image** from all the other **Images** in the sequence pixel by pixel. Clicking **Subtract** evokes the **Subtracted Photo** edit box displaying the name of the file representing the **Image** to be subtracted. To leave the **Subtraction Mode** again click the same button now named **Undo Subtract**.

5. **Upper Limit** – dragging this slider to a new position as displayed in the associated **Edit** box, sets the upper limit of **Data Values** to be included in the **Image** and displays this **Image**. Alternatively print a new value in the **Edit** box and press **Enter**.

6. **Lower Limit** – dragging this slider to a new position as displayed in the associated **Edit** box, sets the lower limit of **Data Values** to be included in the **Image** and displays this **Image**. Alternatively print a new value in the **Edit** box and press **Enter**.

7. **Mask** – FiFr (Fixed Fraction) selects the fraction of the actual **Image** set by **Lower Limit** and **Upper Limit** and applies this **Mask** to all **Images** in the sequence. Fr (Fraction) selects the fraction set by **Lower Limit** and **Upper Limit** and applies this selection when setting the individual **Masks** to the **Images**. Fi% (Fixed Percentage) uses a **Mask** based on the values set by **Lower Limit** and **Upper Limit** in the actual **Image** and applies this **Mask** to all Images in the sequence. % uses individual **Masks** to all **Image** based on the **Lower Limit** and **Upper Limit** values. Level uses the set **Lower** and **Upper Limits** as absolute levels.

8. **Refresh** – clears the **Photos** from **ROI** selections.

9. **Reset Mask** – resets the actual mask.

Addendum: The **Crop Images** frame is accessible from the **Show/Crop Page**. The **ROI** selection, **Upper Limit** and **Lower Limit** selection may be combined to select **Image** data within a certain range and physical region of interest in the **Photo**. On the basis of this selection, the **Data Values** are calculated for further presentation in the **Group of Images** window. The **Mask** is particularly useful for automatically setting the **Region of Interest** and forms the core of increasing productivity in many applications. The possible settings (FiFr, Fr, Fi%,% and Level) is further illustrated in the Figure below. If an image contains single high values the Fi% and % setting may display a low number of active points within the **Mask** because very few values reach the set percentage **Limit** of the highest value. This problem is overcome when the FiFr and Fr settings are used because these settings will always display a number of points within the **Mask** corresponding to the fraction of the entire number of points in the image as set by the **Limit**.

	Fraction (Fr)	Percentage(%)
Non-Fixed	**Fr** Mask calculated individually for each separate image Limit set as the fraction of all values	**%** Mask calculated individually for each separate image Limit set as percentage of highest value in the image
Fixed	**FiFr** Mask always in the same place for all images as set in the reference image. Limit set as the fraction of all values	**Fi%** Mask always in the same place for all images as set in the reference image. Limit set as percentage of highest value in the image

Part 8 - Movie frame

1. **Create Movie –** creates a **Movie** from the sequence of **Images** selected. While building the **Movie,** the system displays the different **Image** frames that will combine into the resulting **Video Clip**.

2. **Interpol Video –** generates a video from the actual image sequence with a length (in seconds) that is set in the **Video-Length** window. Insert the desired length of the video in the edit text box and click the **OK**-button in the **Video-Length** window. The video is generated by calculating interpolated images in between the real images in the sequence. This procedure is particularly useful when a video is to be presented in e.g. a Power Point presentation.

3. **Save Movie** – saves the created **Movie** in a file and folder set in the **Save As** dialog window.

4. **Load Movie** – loads a previously created and saved **Movie**.

5. **Speed –** dragging the slider to a new position sets a new **Speed**, as displayed in the **Edit** box, at which the **Movie** runs following clicking the **Start Movie** button. Keeping the pointer over the leftmost or rightmost arrow in the slider, with the left mouse button down, continuously moves the slider while the **Edit** box is updated to a new **Speed** setting. Alternatively print a new value in the **Edit** box and press **Enter**.

6. **Start Movie** –starts the **Movie** created by or loaded by the system.

7. **Save As Images** – splits up a video-clip into individual photos and saves these to file.

Part 9 - View Frame

1. **Azimuth –** dragging the slider to a new position changes the azimuth presentation angle as displayed in the associated **Edit** box. Keeping the pointer over the leftmost or rightmost arrow in the slider, with the left mouse button down, rotates the **Image** while the **Edit** box is continuously updated. The **Image** is rotated stepwise by successively clicking any of the arrows. Alternatively, a new value can be written in the **Edit** box. Activate the new settings by pressing **Enter**.

2. **Elevation –** dragging the slider to a new position changes the elevation presentation angle as displayed in the associated **Edit** box. Keeping the pointer over the leftmost or rightmost arrow in the slider, with the left mouse button down, rotates the **Image** while the **Edit** box is continuously updated. The **Image** is tilted stepwise by successively clicking any of the arrows. Alternatively, a new value can be written in the **Edit** box. Activate the new settings by pressing **Enter**.

3. **Plot Density** - dragging the slider to a new position changes the density of the plot grid associated with the **Image** presentation as displayed in the **Edit** box. Selecting a low **Plot Density**, speeds up the update procedure of the **Image** while at the same time the resolution is reduced, without affecting the **Data** values.

4. **Rotate Azim** – clicking this button rotates the **Image** successively from 0 to 360 degrees. A low **Plot Density** speeds up the procedure. Interrupt the rotation procedure by clicking the button now labeled **Stop Rotate**.

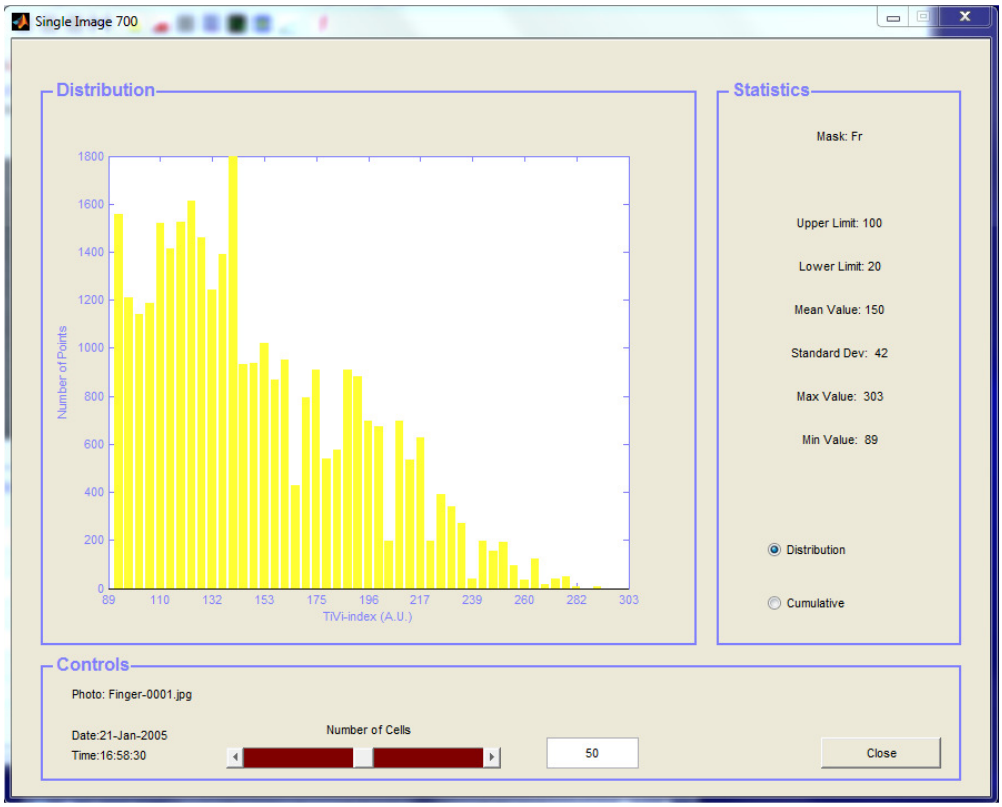
5. **Rotate Elev** – clicking this button changes the view angle under which the **Image** is seen over the range 0 to 90 degrees. A low **Plot Density** speeds up the procedure. Interrupt the rotation procedure by clicking the button now labeled **Stop Rotate**.

6. **Plot Method** – selecting **Surface**, **Interpolated** and **Mesh** respectively displays the **Image** using different plot methods. The default **Plot Method** is **Surface**.

Addendum: Setting a specific **View Angle**, in the **View** frame, makes the system use this **View Angle** during all succeeding **Image** operations, until selecting a new **Azimuth** or **Elevation** angle again changes it. Selecting a low **Plot Density** speeds up all **Image** processing operations.

Part 10 - Single Image Window

Clicking **Single Image** in the **Analysis** menu evokes the **Single Image** window.



1. The **Mask** selection, **Date** and **Time** indicate how the **Image** was generated and when the **Photo** was captured. Relevant parameters are displayed in the **Statistics** panel.

2. **Number of Cells** – dragging the slider to a new position, as indicated by the **Edit** box, selects a new number of cells used for displaying the spatial variability of the **Image** data points. Alternatively print a new value in the **Edit** box and press **Enter**.

3. **Distribution** – displays the distribution of **Image Data** points using the number of cells set by the **Number of Cells** slider. The height of the bars represents the number of **Image** data points in each cell.

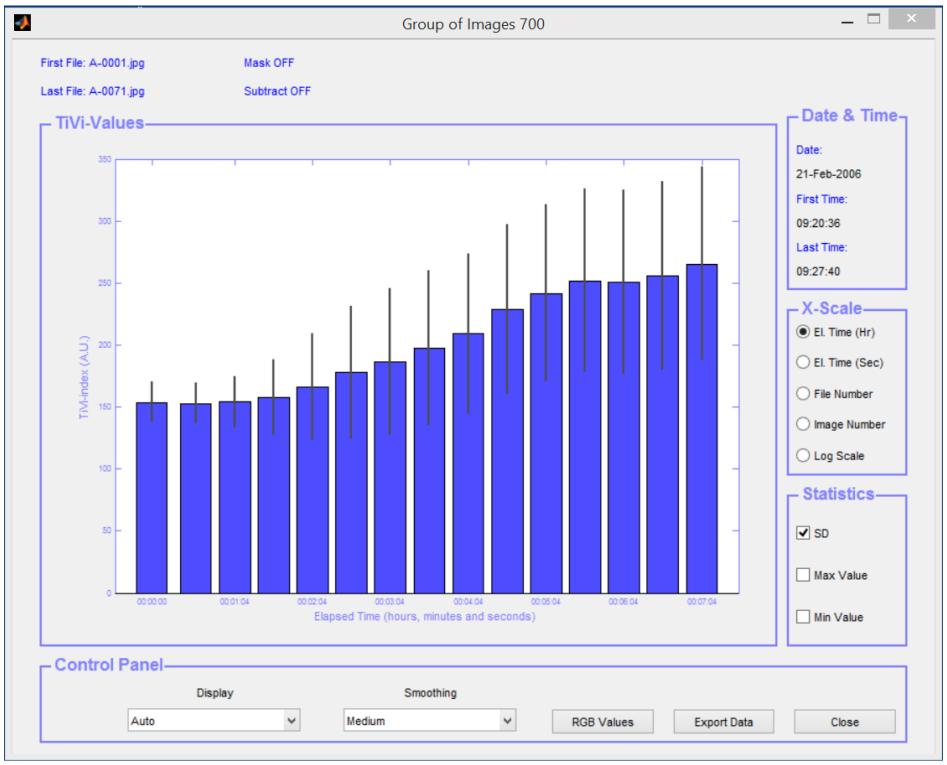
4. **Cumulative** – displays the cumulative distribution of **Image** data points.

5. **Close** – to close the **Single Image** window.

Addendum: The **Single Image** window is useful for identifying outlier **Image** data values and for the interpretation of the **Data Values** generated by the system. Multiple copies of the window can be kept open at the same time.

Part 11 - Group of Images Window

Clicking **Group of Images** in the **Analysis** menu evokes the **Group of Images** window.



1. The **Mask ON/OFF, Mask** selection**, Subtraction mode. Mask ON/OFF**, **Date** and **Time** indicate how the **Image** was generated and when the **Photos** were captured. If applicable **Upper** and **Lower Limits** are displayed.

2. **Radio buttons in the X-Scale panel –** checking these **radio-buttons** selects the **x-axis** coordinates to be displayed in the diagram.

   a. Checking **File Number** displays the file number of the file along the x-axis**.**
   b. Checking **Log Scale** displays the values along a logarithmic x-scale.
   c. Checking the **Image** number displays the image number of the file along the x-axis**.**
   d. Checking **El. Time (Hr)** displays the elapsed time in hours, minutes and seconds along the x-axis**.**
   e. Checking **El. Time (Sec)** displays the elapsed time in seconds along the x-axis**.**

   The diagram is automatically updated when a radio-button is changed. The system preserves the setting of the individual check boxes until changed again by the user.

3. **Check Boxes in the Statistics panel –** checking these **check-boxes** selects the following parameters to be displayed in the diagram.

a. Checking **SD** displays the standard deviations**.**
b. Checking **Max Value** displays the maximum values.
c. Checking **Min Value** displays the minimum values.

.

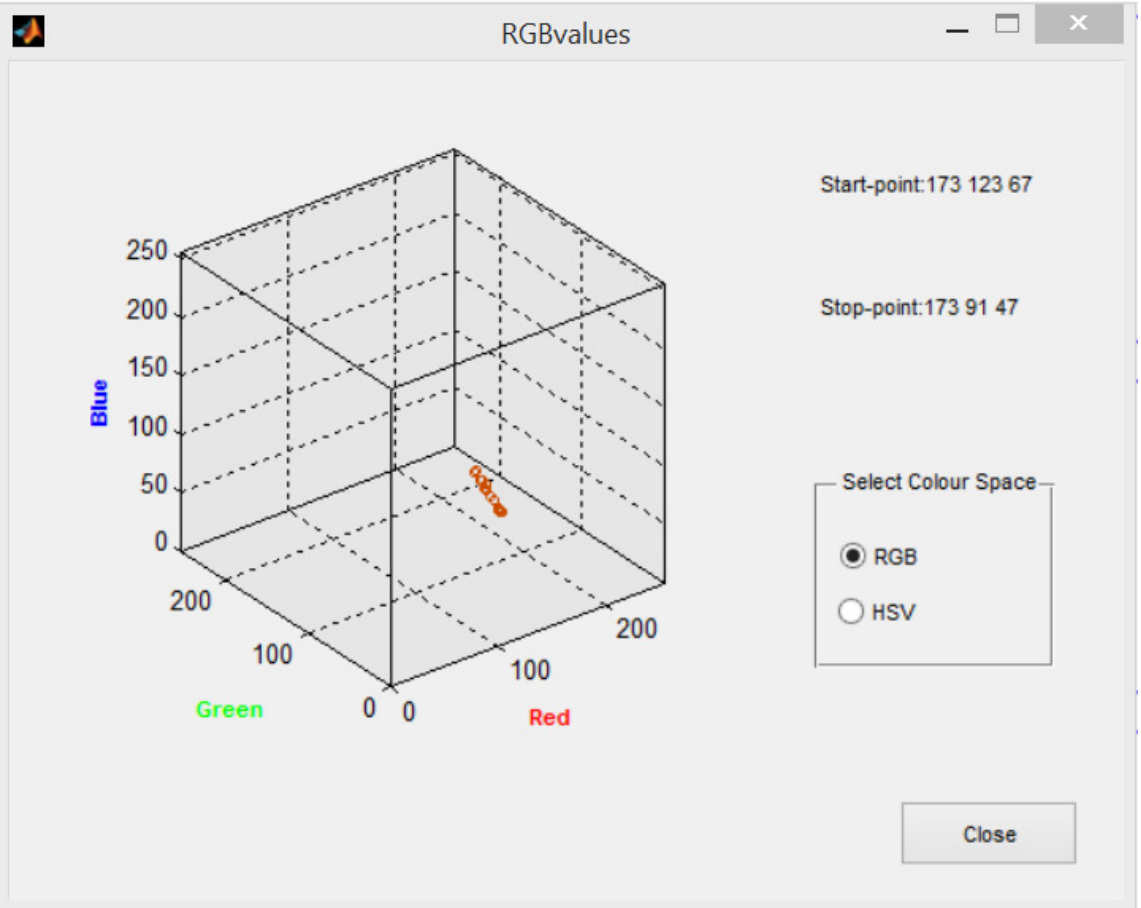
4. **Display** pull**-**down menu – selecting diagram y-scale.

5. **Smoothing** pull-down menu – selecting **Medium** displays all values moderately smoothed, selecting **None** displays all values un-smoothed and selecting **More** displays all values strongly smoothed.

6. **RGB Values** – to open the **Colour Space** window and display the RGB values.

7. **Export Data** – to export values to and Excel spreadsheet (including RGB triplet values.

8. **Close –** closes the **Group of Images** window.



9. **The RGBvalues Colour Space** window displays the RGB triplet values in either the RGB or the HSV colour space.

10. **RGB radio-button** – click to display the triplets in the RGB colour space.

11. **HSV radio-button** – click to display the triplets in the HSV colour space.

12. The **Start-point** displays the triplet for the first photo in the sequence. The **Stop-point** displays the triplet for the last photo in the sequence.

Part 12 - Curve Tracker Window

Clicking **Curve Tracker** in the **Analysis** menu evokes the **Curve Tracker** window.

1. If more than one **Image** is loaded, the **Curve Tracker** opens in the **Curve** mode, as displayed above.

2. In the **Date & Time** panel the date and time of photo capturing is displayed.

3. In the **White Track** panel, the statistics (**SD, Max Value** and **Min Value**) of the last identified region of interest (always displayed in white color), can be activated or deactivated by use of the check-boxes entitled **SD**, **Max Value** and **Min Value.**

4. In the **Subtract First Image** panel, checking the **Sub First Image** check-box subtracts the first image values from all the res and all curves start from the zero level.

5. **Radio buttons in the X-Scale panel –** checking these **radio-buttons** selects the **x-axis** coordinates to be displayed in the diagram.

    a. Checking **File Number** displays the file number of the file along the x-axis**.**

b. Checking **Log Scale** displays the values along a logarithmic x-scale.
c. Checking the **Image** number displays the image number of the file along the x-axis**.**
d. Checking **El. Time (Hr)** displays the elapsed time in hours, minutes and seconds along the x-axis**.**
e. Checking **El. Time (Sec)** displays the elapsed time in seconds along the x-axis**.**

6. When clicking the rectangular squares in the **Track Displayed** panel, the corresponding curve is temporary hidden. Clicking the actual square once more again displays the curve.

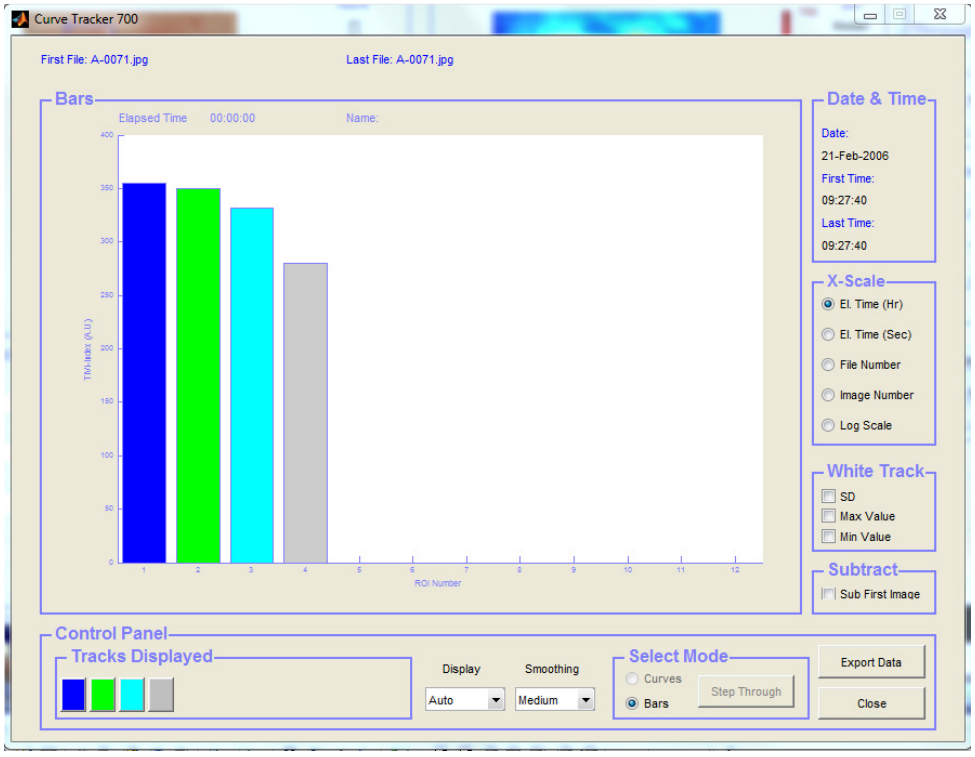
7. In the **Display** pull-down menu, the scale of the y-axes is set.

8. **Smoothing** pull-down menu – selecting **Medium** displays all values moderately smoothed, selecting **None** displays all values un-smoothed and selecting **More** displays all values strongly smoothed.

9. **Export Data** button – to export data to an Excel spreadsheet.

10. **Close** – to close the **Curve Tracker** window.

11. If only one **Image** is loaded, the **Curve Tracker** opens in the **Statistics** mode, as displayed below.



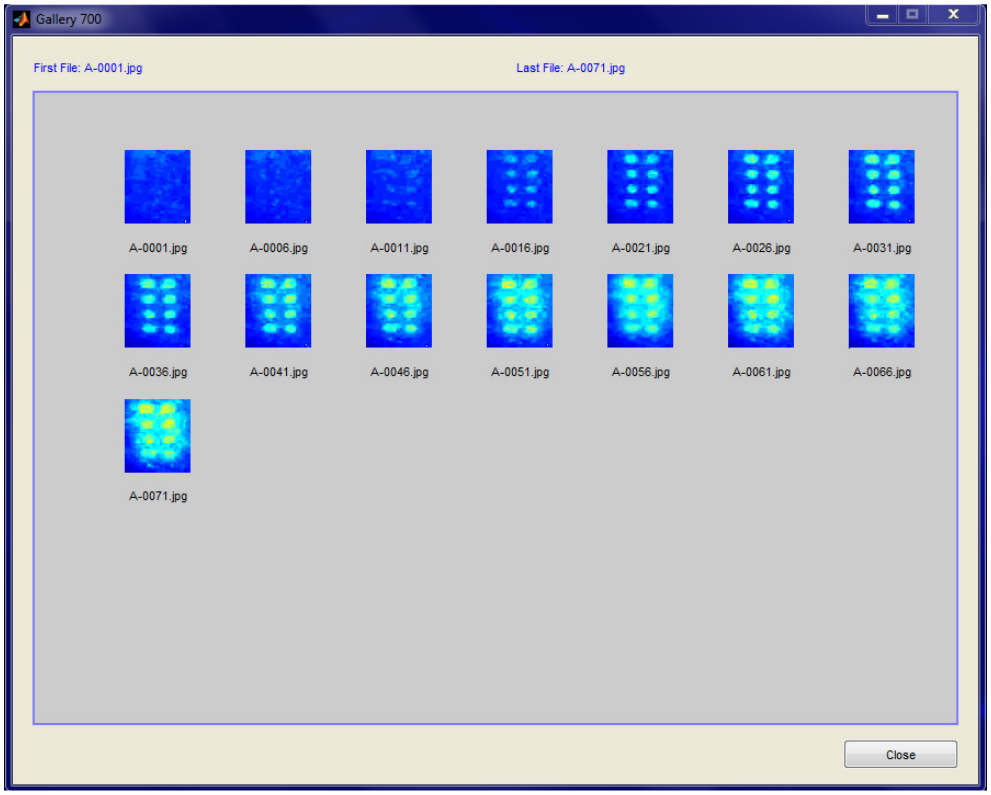
12. In the **Select Mode** panel clicking the **Curves** radio-button displays the curve mode diagram.

13. In the **Select Mode** panel clicking the **Bars** radio-button displays the bar diagram.

14. Clicking the **Step Through** button displays the successive set of **ROI**s for different **Images**.

Part 13 - Gallery Window

Clicking **Gallery** in the **Analysis** menu evokes the **Gallery** window.

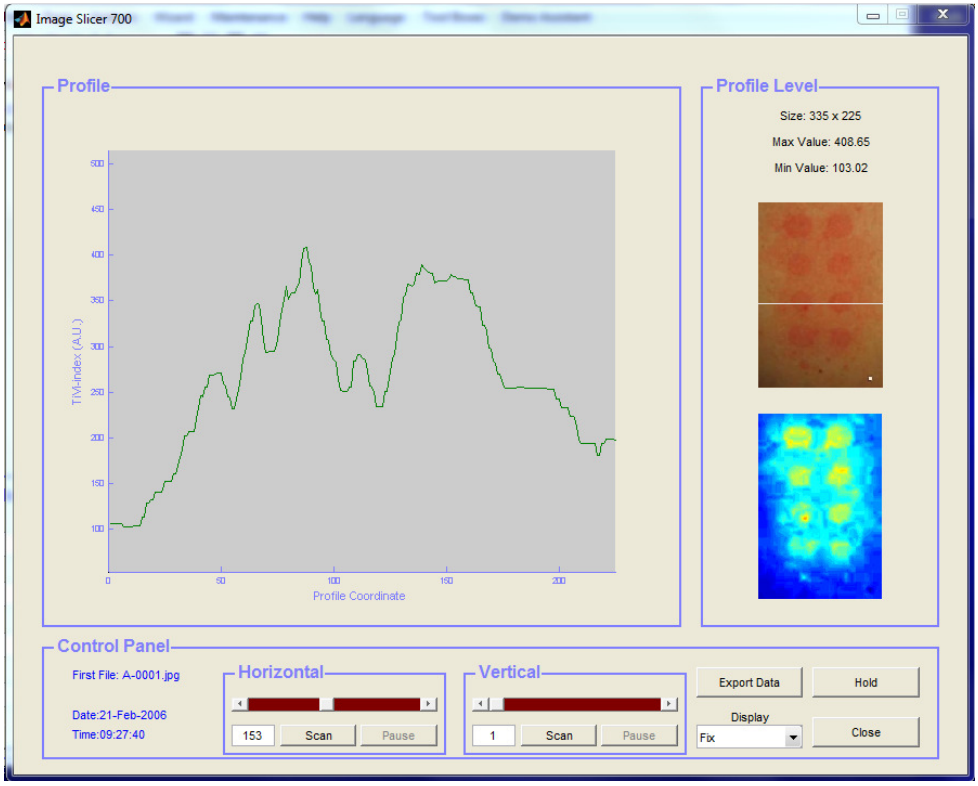


1. The **Gallery** window displays the entire sequence of **Images** in color representation as selected by **Plot Color** in the **View** frame. The layout automatically adapts to the number of **Images** included in the sequence. In total 150 **Images** can be displayed in the **Gallery** window. The actual number of the **Image** is displayed below respective **Image**.

2. **Close** – to close the **Gallery** window.

Part 14 - Image Slicer Window

1. The **Image Slicer** window is evoked by clicking **Image Slicer** in the **Analysis** pull-down menu.



2. The right-most display areas (**Photo** and **Image**) in the **Profile Level** panel display the position of the actual slice.

3. The left-most display area displays the **Profile** of the actual slice.

4. The positions of the actual slice are controlled by the sliders, edit boxes and buttons within the **Horizontal** and **Vertical** panels.

5. Pressing the right-most or the left-most arrow in the slider moves the slice to the right (**Vertical**) or up (**Horizontal**) respectively to the left (**Vertical**) or down (**Horizontal**). The actual position is displayed in the **Edit** box.

6. Dragging the slider moves the slice directly to the target position.

7. Clicking **Scan** makes the slice scan through the complete image.

8. The **Scan** procedure can be halted at any time by clicking the **Pause** button. The **Scan** procedure is continued by clicking the same button now labeled **Cont**.

9. The **Scan** procedure can be terminated at any time by clicking the **Stop** button.

10. The **Display** pull-down menu can be set to either **Fix**, **Auto** or **Fit. Fix** mode implies that the Y-axis is fixed with the end-points set to the maximum and minimum value respectively. **Auto** mode implies that the upper end-point of the Y-axis adapts to the maximum value of the actual **Profile**. **Fit** mode implies that both the upper and lower end-point of the Y-axis adapt to the actual **Profile** maximum and minimum values.

11. Clicking the **Hold** button implies that each new **Profile** is superimposed on the previously displayed **Profiles**. Clicking the same button again, now labeled **Erase**, returns the system to displaying only a single **Profile**.

12. Clicking the **Close** button closes the **Image Slicer** window.

13. The **File Name**, **Date** and the **Time** of **Image** capturing are displayed in the left side of the **Control Panel**.

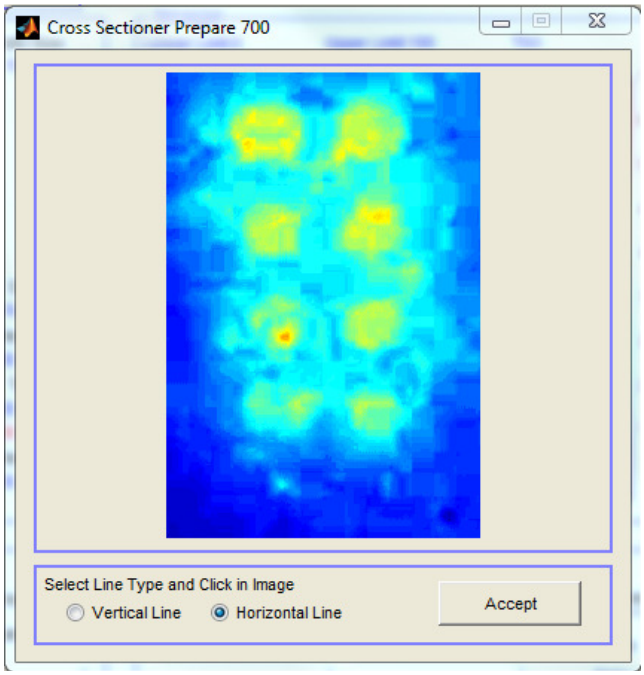
14. The **Image** size as well as the **Maximum** and **Minimum** value of the actual **Profile** are displayed in the top right corner of the **Profile Level** window.

Part 15 - Cross Sectioner Window

To display a sequence of cross sections, a specific **Cross Section** of the **Images** needs to be loaded. Proceed as follows.

1. Load a **Photo** sequence (in this case the test image sequence **A-0001** to **A-0071** stored in the **MN DATA** folder).

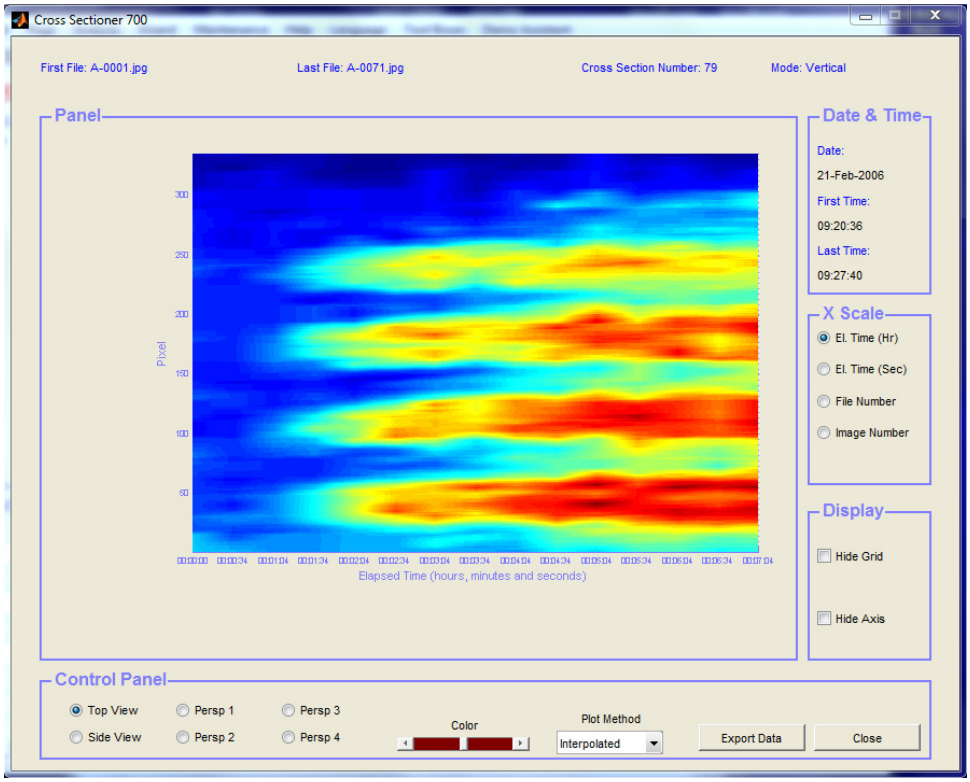
2. Select **Cross Sectioner** from the **Analysis** pull-down menu. The **Cross Sectioner Prepare 700** window will now open.



3. Select **Vertical Line** or **Horizontal Line** by checking the associate radio-button.

4. Click somewhere in the **Image** to generate the line.

5. Click **Accept** to accept the line selection. The **Cross Sectioner 700** window will no open.



6. **Date & Time** panel - displays date and time of photo capturing.

7. **X-Scale** panel – check radio-button to select t x-scale.

    a. Checking **File Number** displays the file number of the file along the x-axis**.**
    b. Checking the **Image** number displays the image number of the file along the x-axis**.**
    c. Checking **El. Time (Hr)** displays the elapsed time in hours, minutes and seconds along the x-axis**.**
    d. Checking **El. Time (Sec)** displays the elapsed time in seconds along the x-axis**.**

8. **Display** panel – check the **Hide Grid** and **Hide Axis** to hide the grid and/or the axis.

9. **Control Panel**

    a. Check **Top View, Side View, Perps 1, Persp 2, Persp3** or **Persp 4** to select the view angle.
    b. Drag the **Color** slider to alter the diagram color scale.
    c. Select **Plot Method** in the **Plot Method** pull-down display.
    d. **Export Data** – to export data to Excel.

e. **Close** – to close the window.

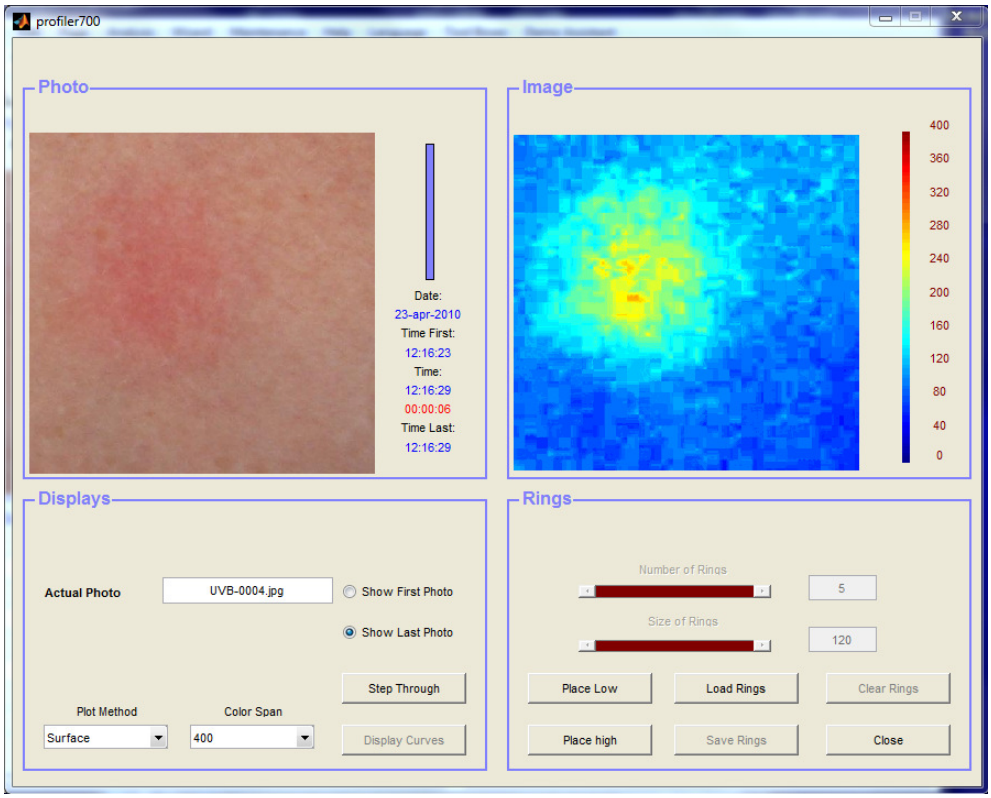
10. **First** and **Last File Name, Cross Section Number** and **Mode** are displayed above the **Cross Section Map** panel.

Part 16 - Profiler Window

The **Profiler** is useful for displaying and analyzing circular erythema and blanching reactions.

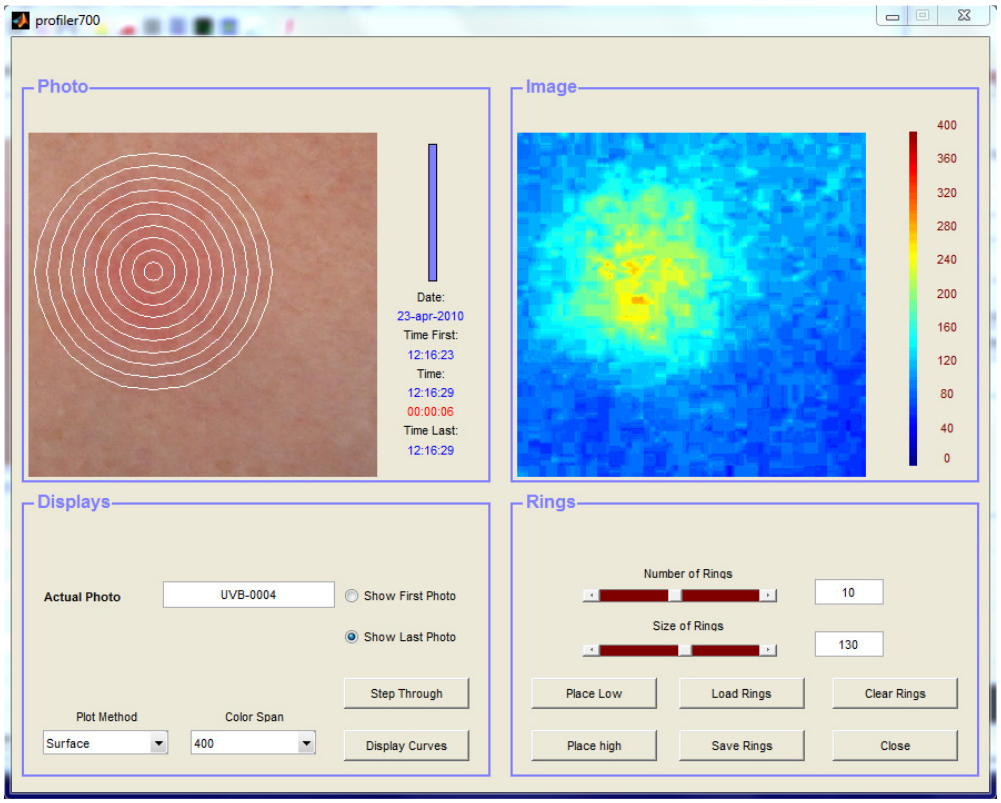
1. Load a **Photo** sequence (in this case the test image sequence **UVB-0001** to **UVB-0004** stored in the **PROFILER FILES**.

2. Select **Profiler** form the **Analysis** pull-down menu. Click the **Show Last Photo** radio-button. The **Profiler** window should now look like:

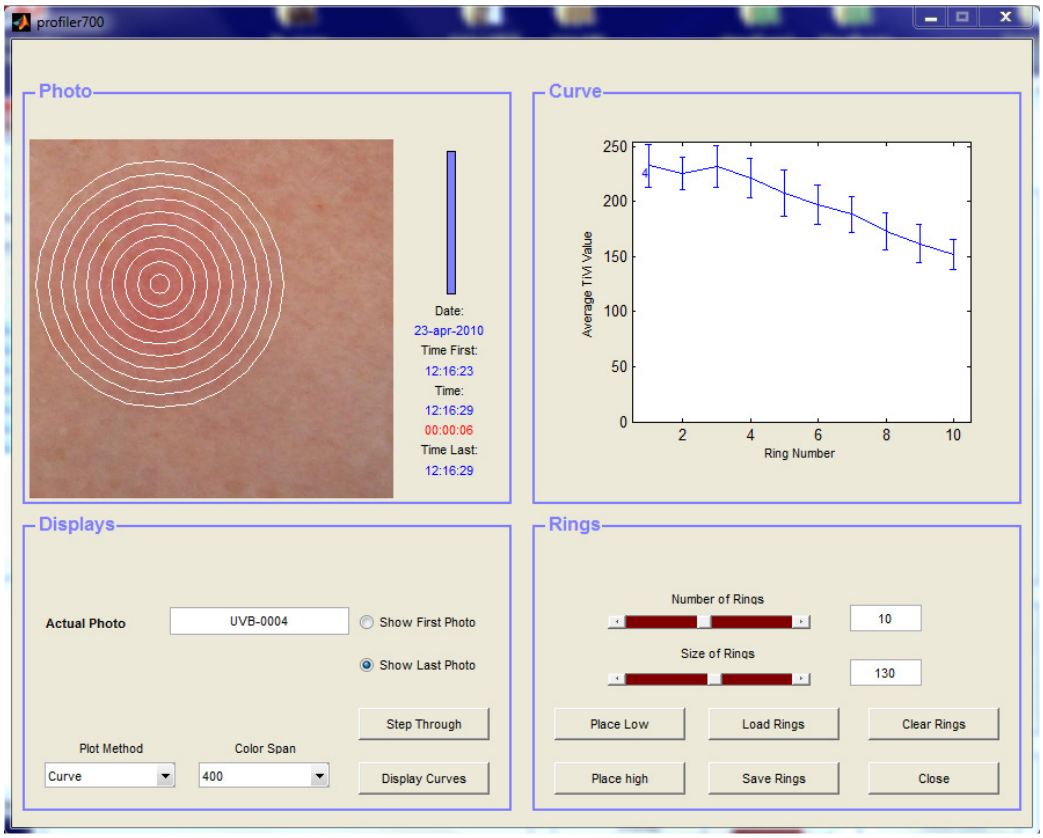


3. Click the **Place High** button. After a while 5 concentric rings will be automatically placed around the peak value of the reaction.

4. Drag the **Number of Rings** slider to the right until the edit box displays 10. Drag the **Size of Rings** slider to the right until the edit box displays 130. The **Profiler** window should now look like (alternatively insert the number directly in the edit box and press **Enter**) :



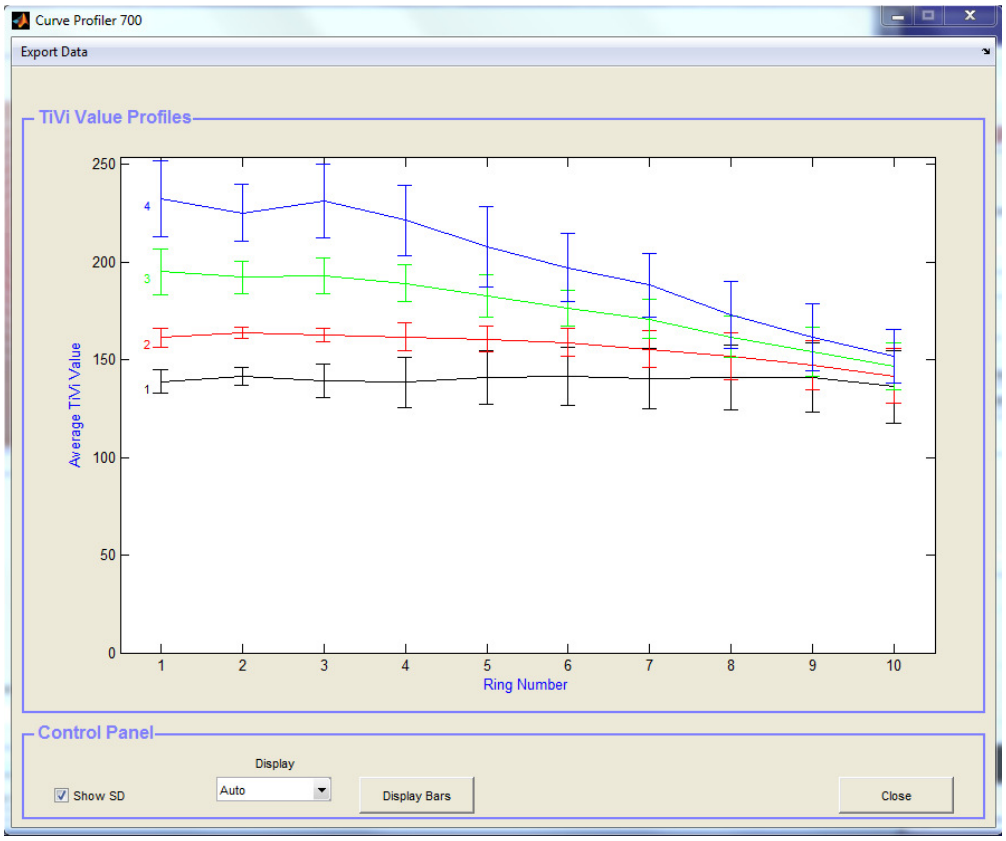
5. Select **Curve** under the **Plot Method** popup menu. The **Profiler** window should now look like:



6. The **Curve** displays the average TiVi value within the different rings and the associated standard deviation.

7. Click the **Step Through** button repeatedly to step through the sequence of photos uploaded.

8. Click the **Display Curves** button to display all curves in a separate window:

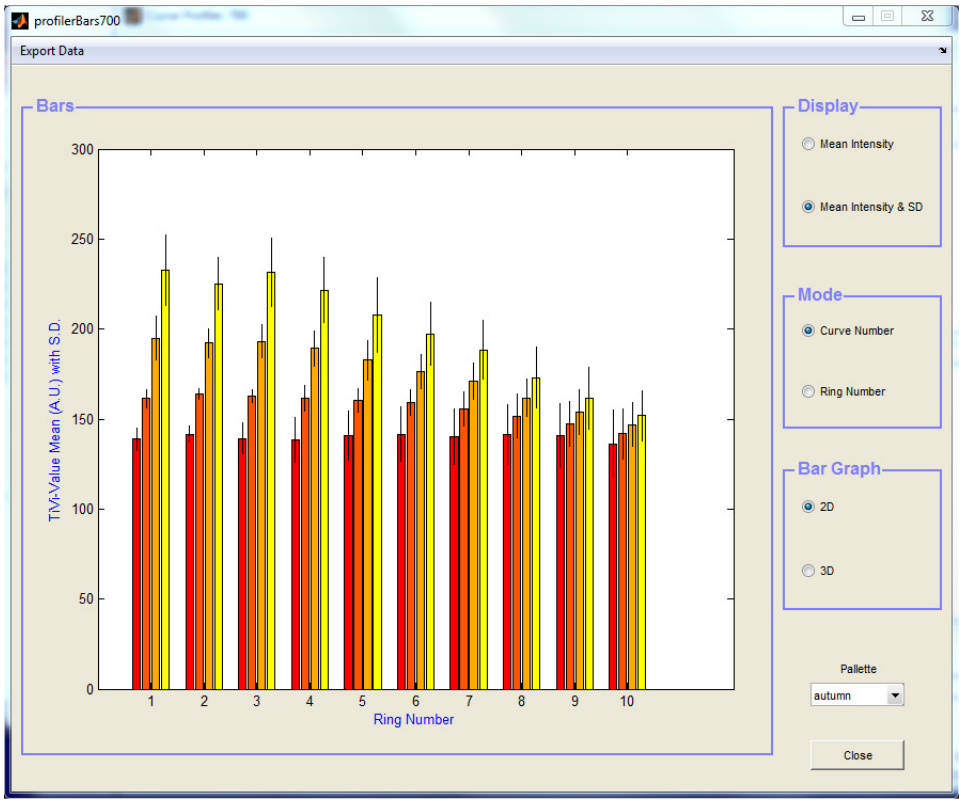


9. In the **Control** panel:

   a. **Show SD** – to display or hide the standard deviation bars.
   b. **Display** – to set the y-axis.
   c. **Display Bars** – to display the result as a bar graph.
   d. **Close** – to close the window.

10. Click the **Display Bars** button to display the result as a bar-graph.
   a. Display Panel
      i. **Mean Intensity** – to display the mean intensity.
      ii. **Mean Intensity & SD** – to display standard deviations on the mean value bars.
   b. Mode Panel
      i. Curve Number – displays curve number along x-axis.
      ii. Ring Number – ring number along the x-axis.
   c. Bar Graph Panel
      i. 2D - displays the diagram in 2D mode**.**
      ii. 3D – displays the diagram in 3D mode (can be rotated).
   d. Pallette pull-down menu –to select bars color palette.
   e. Close button – to close the window.

11. Export Data – exports data to an Excel spreadsheet**.**

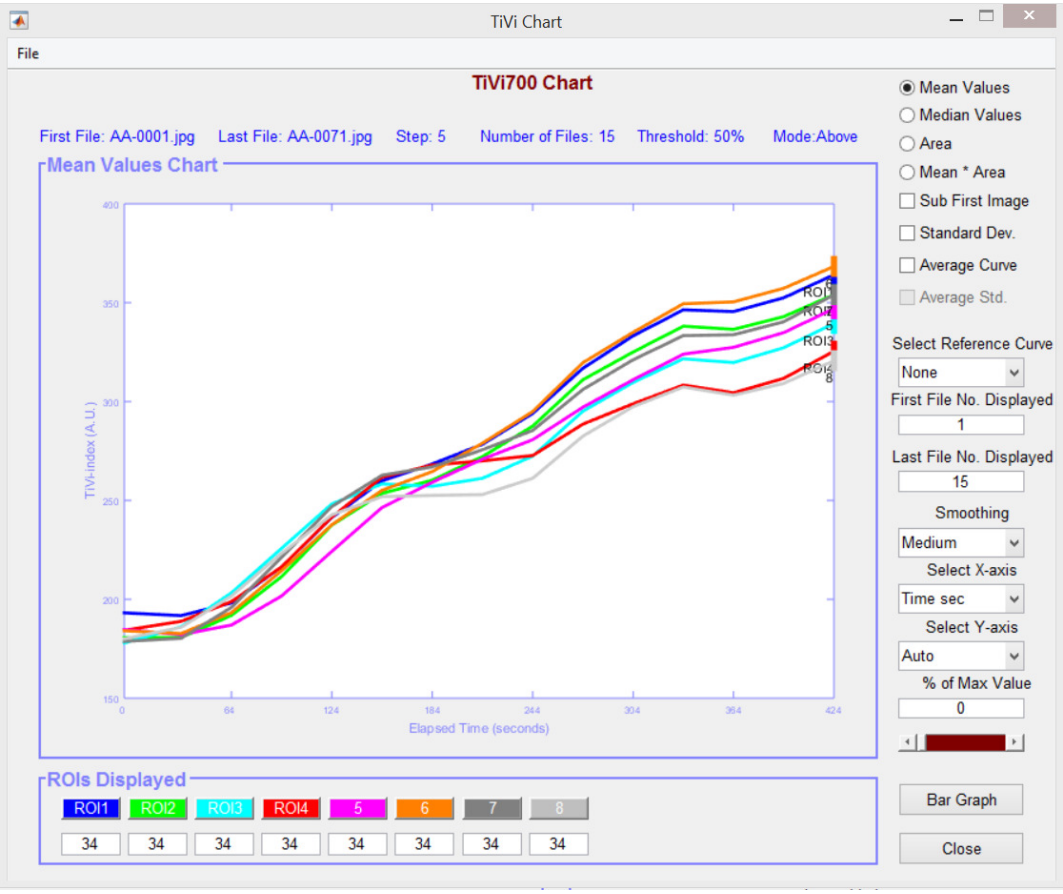


Part 17 – Wizard

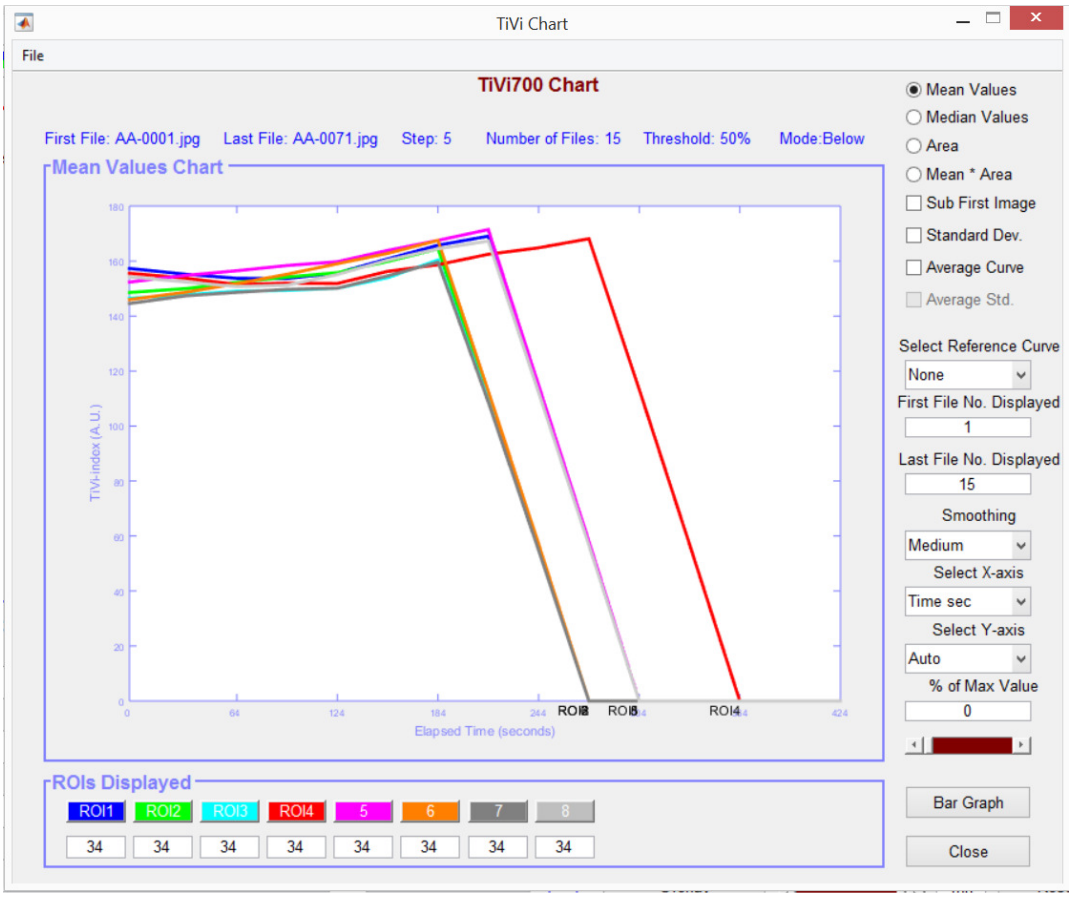
The **Wizard** is intended for rapid and automatic analysis of a sequence of **Images** in which **ROIs** have been drawn. The **Wizard** calculates the average TiVi-value inside the **ROIs** including only pixels above or below set threshold.

First the **Welcome to the Express Wizard** is displayed in which the **Above Threshold** or **Below Threshold** mode can be selected and the **Threshold** level set. When clicking the OK button these values are accepted and the **TiVi Chart** window is displayed

The **TiVi Chart** window displays the calculated TiVi values for each **ROI** and **Image**.



With Threshold = 50% and **Above** mode selected.



With Threshold = 50% and **Below** mode selected.

Part 18 – TiVi700 Chart Window

1. **Mean Values radio-button** – check to display average TiVi-values.
2. **Median Values radio-button** – check to display median TiVi-values.
3. **Area radio-button** – check to display the surface area of individual patches.
4. **Mean * Area** – check to display the product of average TiVi-Values and the surface area.
5. **Sub First Image check-box** – check to subtract the first Image **ROI** TiVi-values from the remaining TiVi-values in the sequence of **Images.**
6. **Standard Dev check-box** – check to display the standard deviations of the last (white) ROIs.
7. **Average Curve** – check to display the average curve.

8. **Average Std**. – check to display the standard deviation of the average curve.

9. **Select Reference Curve** – subtracts the TiVi-values in the selected curve from al the remaining TiVi-values. This feature is useful to relate TiVi-values of various **ROIs** to those of a control **ROI**.

10. **First File No**. **Displayed** – to select the first file number displayed.

11. **Last File No**. Displayed – to select the last file number displayed.

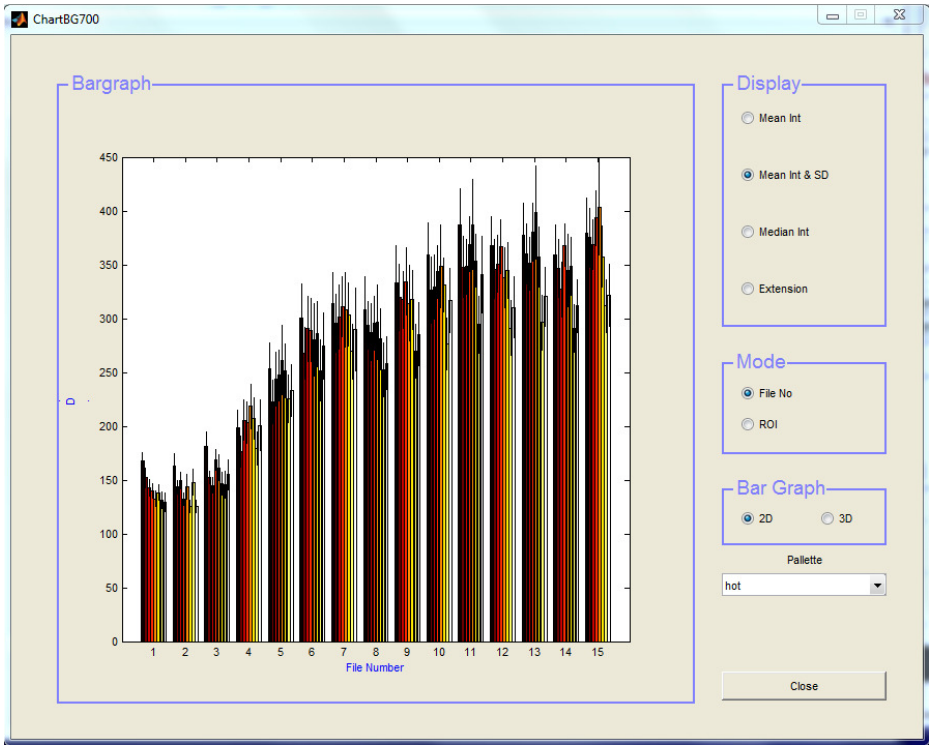
12. **Smoothing** – to select the degree of smoothing.

13. **Select X**-axis – to select the x-axis scale.

14. **Select Y**-axis – to select the y axis scale.

15. **% of Max Value** – creates vertical lines at Images when the set percentage of maximum value (indicated by a dot) has been reached.

16. **Bar Graph** – to display the result in terms of a bar graph.



a. **Display panel.**
   i. **Mean Int** – displays the average TiVi values.
   ii. **Mean Int & SD** – displays the average TiVi-values with standard deviations.
   iii. **Median Int** – displays the median TiVi-values.
   iv. **Area** – displays the surface area of the patches

b. **Mode panel**
   i. **File No. –** sets the file number along the x-axis.
   ii. **ROI –** sets the ROI number along the x-axis.
c. **Bar Graph panel**
   i. **2D –** to display a two-dimensional bar graph.
   ii. **3D –** to display a three dimensional bar graph. By placing the mouse cursor inside and pressing the left mouse button, the **BarGraph** panel the 3D view can be altered.
d. **Pallete** – to select the color scale of the bar graph
e. **Close** – to close the ChartBG700 window.

17. **Close – to close the TiVi700 Chart window**

18. **ROIs Displayed panel**
    a. **Color buttons –** click a color button to temporarily hide the associated curve.
    b. **Edit box –** displays the time/file number/image number at which vertical lines crosses the curves.

19. **File Menu**
    a. **Save TiVi Chart –** to save the actual **TiVi700 chart** (can be re-opened from the **TiVi700 Analyzer** window.
    b. **Close –** to close the actual TiVi Chart.
    c. **Export –** to export data from the TiVi Chart to an Excel spreadsheet.

Above the panels information about the **First File Name, Last File Name, Step, Number of Files, Threshold setting** and **Mode** is displayed.

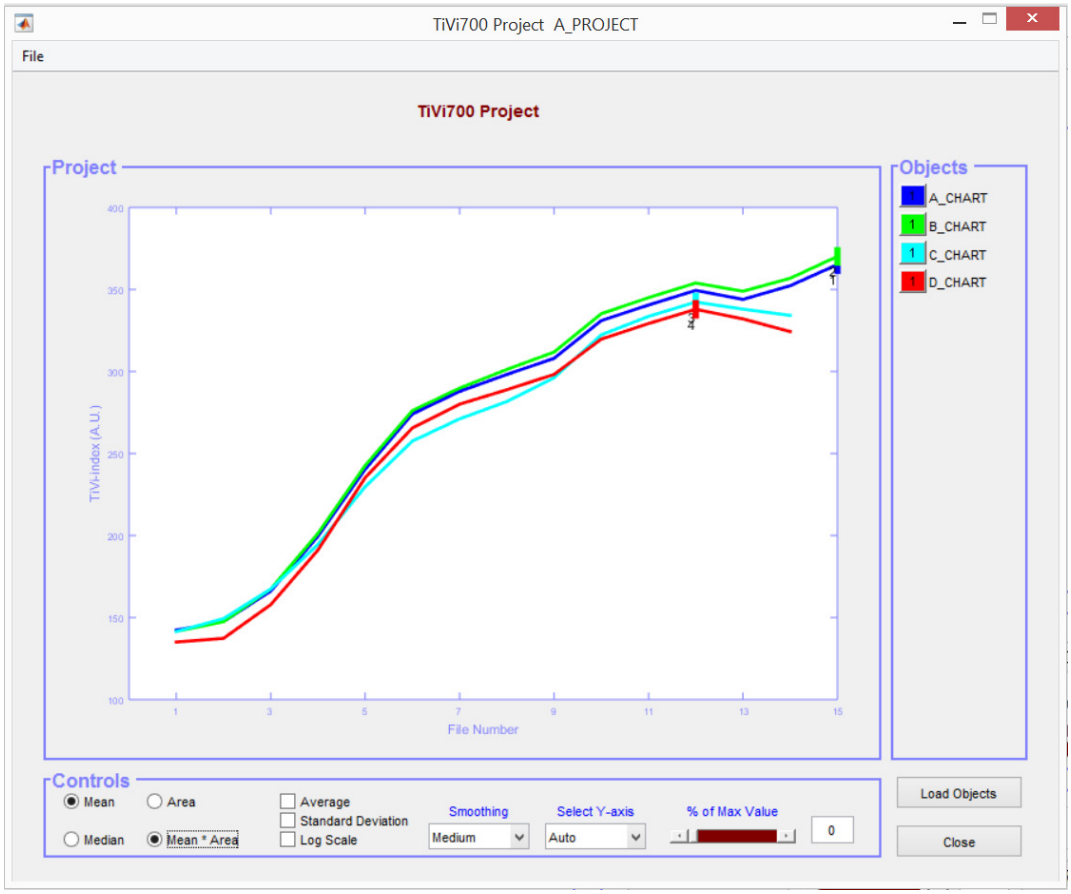
Part 19 - Project Window

The **TiVi700 Project** window displays average TiVi-values by importing these values from a saved **TiVi700 Chart**. While the **TiVi700 Chart** generally represents data recorded from a single subject, the **TiVi700 Project** displays average data values from up to 20 subjects.

A new **TiVi700 Project** window is opened from the **TiVi700 Analyzer** window (File→Project→ New TiVi Project).

An existing **TiVi700 Project** window is opened form the **TiVi700 Analyzer** window (File→Project→ Open TiVi Project).

In the **TiVi Project** window below, seven average TiVi value curves have been uploaded from saved TiVi Charts (AA_CHART→GG_CHART).



1. **Objects panel –** lists all uploaded objects.
    a. Remove object permanently by clicking on its corresponding quadrat in the **Objects** panel

2. **Controls panels**

    a. **Mean radio-button –** click to display average values.
    b. **Median radio-button –** click to display median values.
    c. **Area –** click to display the average patch area values.
    d. **Mean * Area** – Click to display the product of Mean an surface area values.
    e. **Average check box –** check to display the average of all curves displayed.
    f. **Standard Deviation check box –** check to display the associated standard deviations.
    g. **Log Scale check-box –** click to display data in logarithmic scale.
    h. **Smoothing –** to smooth the curves displayed (Medium, None, More).
    i. **Select Y-axis –** to set scale of Y-axis.
    j. **% of Max Value –** to display vertical lines corresponding to the file number at which the set percentage of the maximum value (indicated by a square) is reached. The file number is also displayed in the color quadrat next to the name in the **Objects** panel.

3. **File Menu**

a. **Save TiVi Project** – to save the actual TiVi Project.
b. **Export Data** – to export data displayed to an Excel spreadsheet.
c. **Close** – to close the **TiVi700 Project** window.

4. **Load Objects –** to upload a new object to the **TiVi700 Project** window. Click on a saved **TiVi700 Chart** to upload the data.

5. **Close –** to close the **TiVi700 Project** window.

Part 20 - Excel Files Generated

The following Excel Files are generated by the various windows of the **TiVi700 Analyzer**:

TiVi700 Analyzer Main Window:
Export Image: Full Image.

Group of Images Window:
Export Data: Mean Intensity Values, Standard Deviations, Min Intensity Values, Max Intensity Values

Curve Tracker Window:
Export Data: Mean Intensity Values, Median Intensity Values, Standard Deviations, Min Intensity Values, Max Intensity Values

Image Slicer Window:
Export Data: Actual profile.

Cross Sectioner Window:
Export Data: Full Image

Profiler Window (Display Curves):
Export Data: Mean Values, Standard Deviations, Points

Chart Window:
Export Data: Mean TiVi Values, Extension.

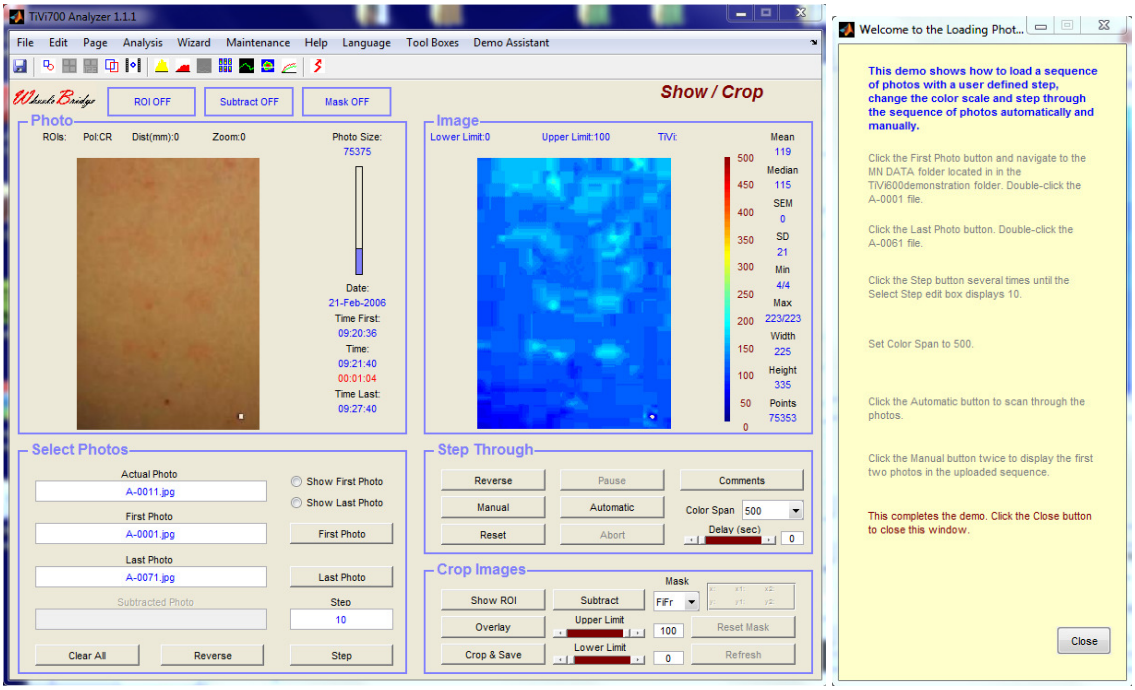
Project Window:
Export Data: Mean TiVi Values, Standard Deviations, Extension.
Perc-F_T: percentage, Image No for % of Max for individual ROIs

Part 21 – Specifications

Property	Value
Type	
Camera Head	Canon EOS 550D / 650D/ 700D
Computer	64 bit, 4GB min (8GB recom.)
Flexible Arm	Neo-Flex
Dimensions	
Computer	4x26x36 cm, 3 kg
Camera	5x18x12 cm, 0.5 kg/ 24x16x13, 1 .5 kg
Flexible Arm	about 50 cm, 1.2 kg
Photo format	jpeg
Photo size (pixels)	1728 x 2592 - 3456 x 5184
Maximal resolution (at 30 cm)	50 micrometers
Distance	10 cm – inf.
Field of View (at 30 cm)	280 x 200 mm
Maximal photos per minute	12
Maximal number of photos in sequence	9999
Instability	
Temperature drift	0.35% per Degrees C
Drift over 2 months period	< 1%
Image uniformity in sensitivity	
Without normalization	3% (corners) 2% (centre)
With normalization	0.25% /corners) 0.13% (centre)
Distance dependence	Not measurable (13 – 28 cm)
Ambient light dependence	
40W bulb at 50 cm distance	10%
11W fluorescent light source at 50 cm distance	10%

Part 22 - Demo Assistant

The *Demo Assistant* is an online interactive guide to the effective use of the basic functions and features of the TiVi700-system. The *Demo Assistant* is available from the **Demos Assistant** pull-down menu. When a topic in the *Demo Assistant* is selected a specific topic demo window is opened which guides the user step-by step on how to perform certain tasks.



The *Demo Assistant* includes to following topics:

DEMO ASSISTANT
TiVi File Names
Loading Photos
Crop & Save
Thresholding
Movies
Image Subtraction
ROI Management
- Draw ROIs
- Delete ROIs
- Move ROIs
- Stretch ROIs
- Set ROI Parameters
- Save & Load ROIs

Analysis
- Single Image
- Groups of Images

Curve Tracker
Gallery
Image Slicer
Cross Sectioner
Profiler
Wizard
TiVi Chart
Project
TiVi Pre-Processor
Using the *Demo Assistant* is an effective way of getting acquainted with the basic functions and features of the TiVi700 system.

Part 23 DropData

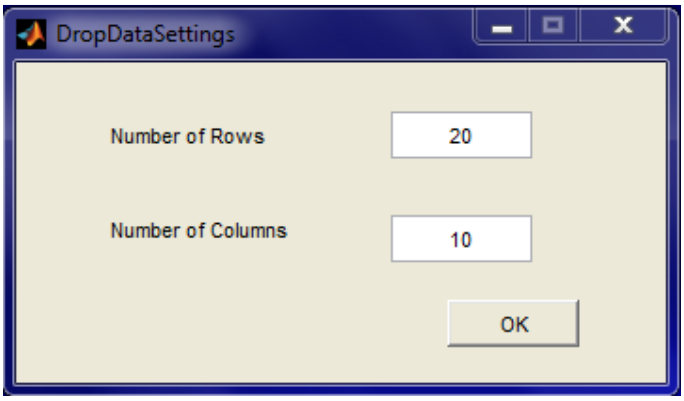
The **Dropdata** feature is a convenient way of bringing image data in focus directly into a spread-sheet by a single click on a spread-sheet cell. The associated **Organizer** holds editable subject data and the subject identifiers can be exported directly to the **DropData** spread-sheet. Both the **DropData** spread-sheet and the **Organizer** spread-sheet are fully editable and both can be saved as **Excel** documents for further processing.

The **DropData / Organizer** features are best explained by an example.

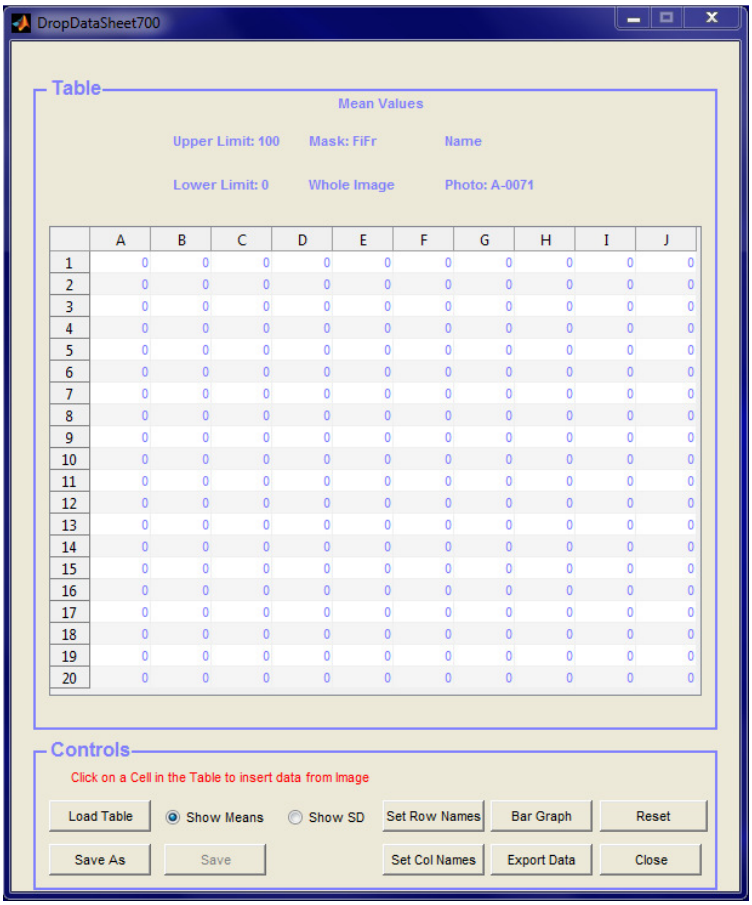
Assume that the response to topical application of methyl nicotinate from three separate subjects has been stored in the files **A-0001 – A-00071, C-0010 – C-0085** and **E-0010 – E-0095** stored in the *MN DATA* folder in the *TiVi700 demonstration* folder.

1. Click the **First Photo Photo** button in the **TiVi700 Analyzer** window and select the A-0001 file in the *MN DATA* folder located in the *TiVi700demonstration* folder.

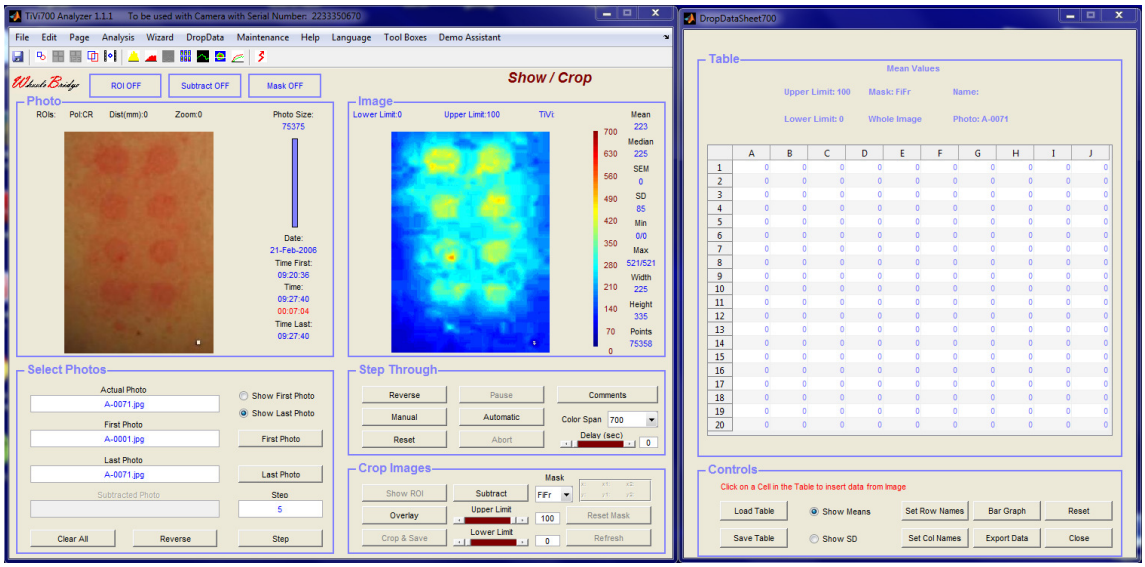
2. Select **Data to Sheet** under the **DropData** pull-down menu. The **DropDataSettings** window will now open.



3. Click the **OK** button to open the **DropDataSheet700** window.



4. Move the **DropDataSheet700** window to a location next to the **TiVi700Analyzer** window.



5. Click the **Show First Photo** radio-button in the **TiVi700 Analyzer** window to display the first photo of the sequence.

6. Click cell A1 in the **Dropdata700** spread-sheet to insert the *Image Mean value* in focus into the **DropData700** table.

7. Click the **Manual**-button in the **TiVi700 Analyzer** window to display the next photo / image in the sequence. Click cell B1 in the **DropData700** spread-sheet to insert the *Image Mean value* in focus into the DropData700 table.

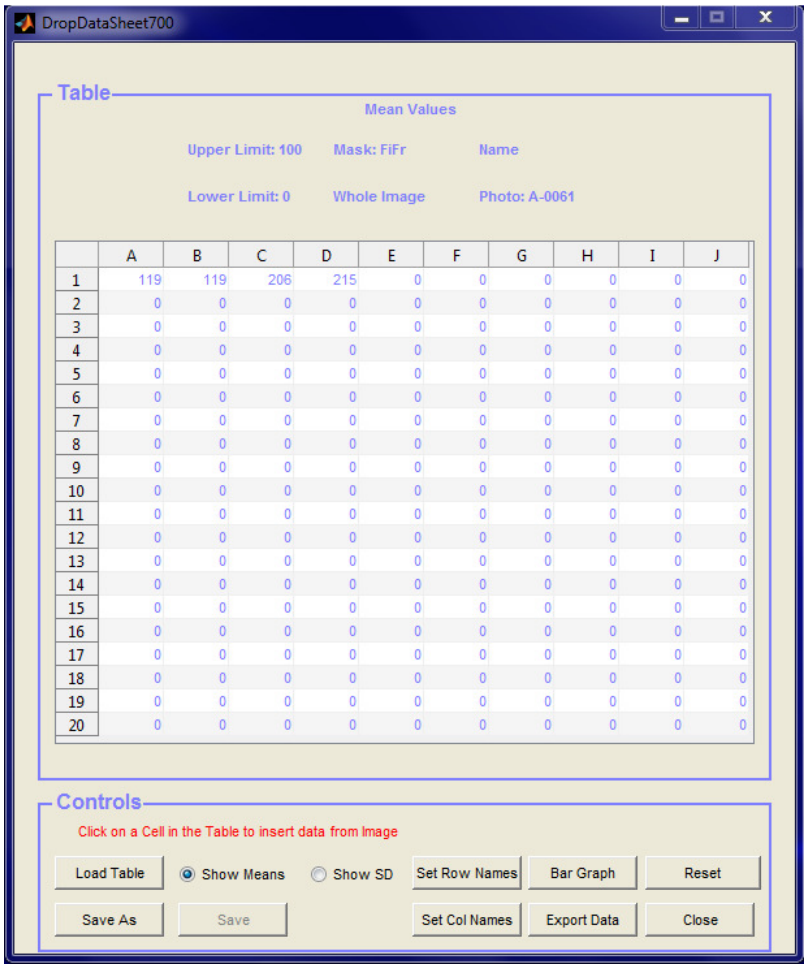
8. Click the **Show Last Photo** radio-button to display the last photo of the sequence.

9. Click the **Reverse**-button and then the **Manual** button and then again click the **Forward** button to display photo A-0066.

10. Click cell C1 in the **Dropdata700** spread-sheet to insert the *Image Mean value* in focus into the **DropData700** table.

11. Click the **Manual**-button in the **TiVi700 Analyzer** window to display the next photo / image in the sequence. Click cell D1 in the **DropData700** spread-sheet to insert the *Image Mean value* in focus into the DropData700 table.

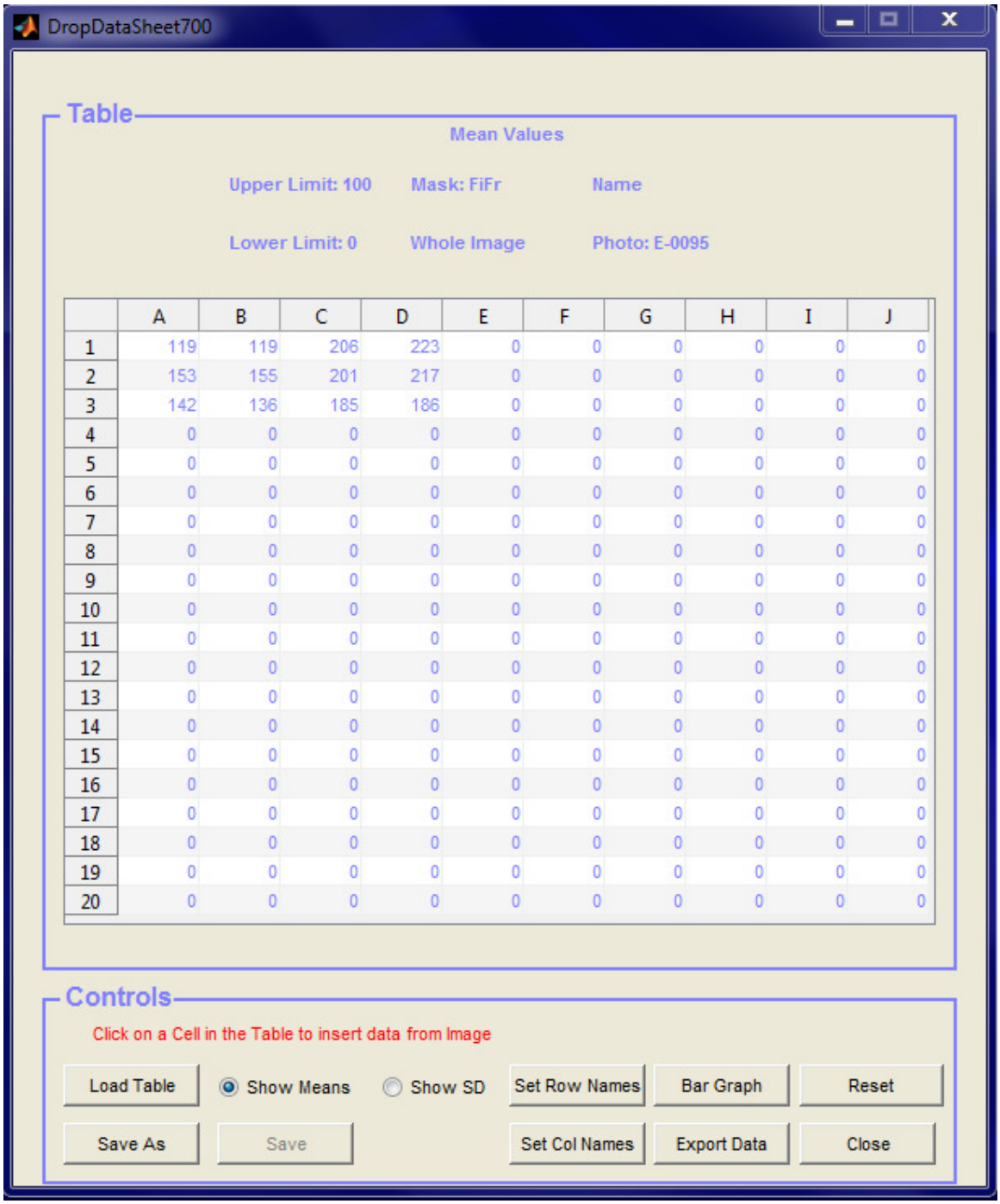
12. The **DropData700** spread-sheet should now look like:



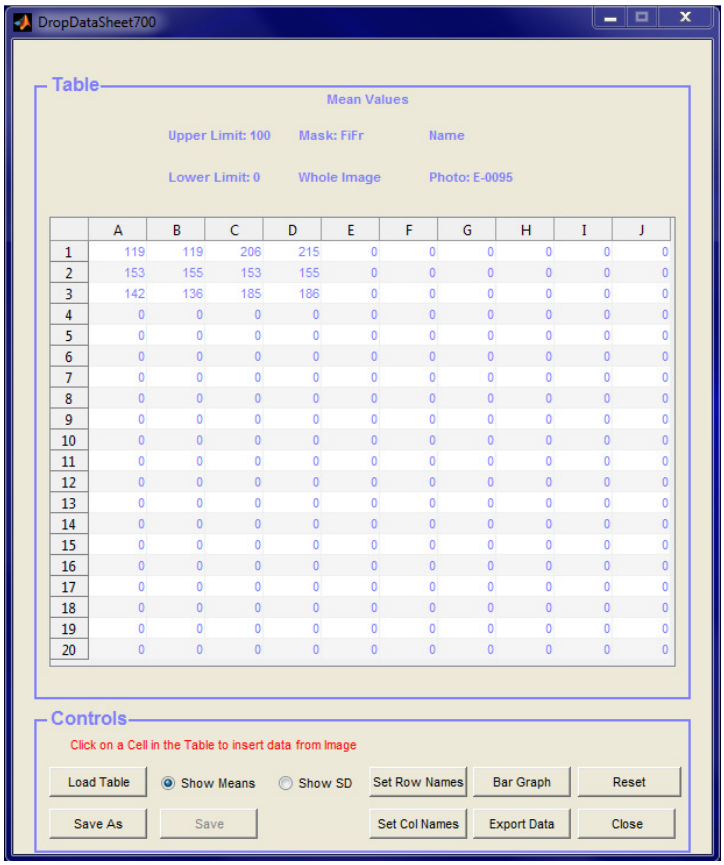
13. The mean TiVi-values of the two first and two last images are now inserted and displayed in the **DropData700** spread-sheet.

14. Repeat the procedure with photo sequences **C** and **E**.

15. The **DropData700** spread-sheet should now look like:



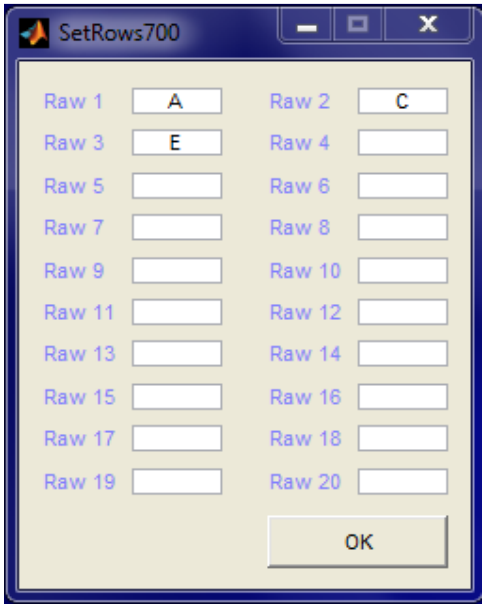
	A	B	C	D	E	F	G	H	I	J
1	119	119	206	223	0	0	0	0	0	0
2	153	155	201	217	0	0	0	0	0	0
3	142	136	185	186	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0



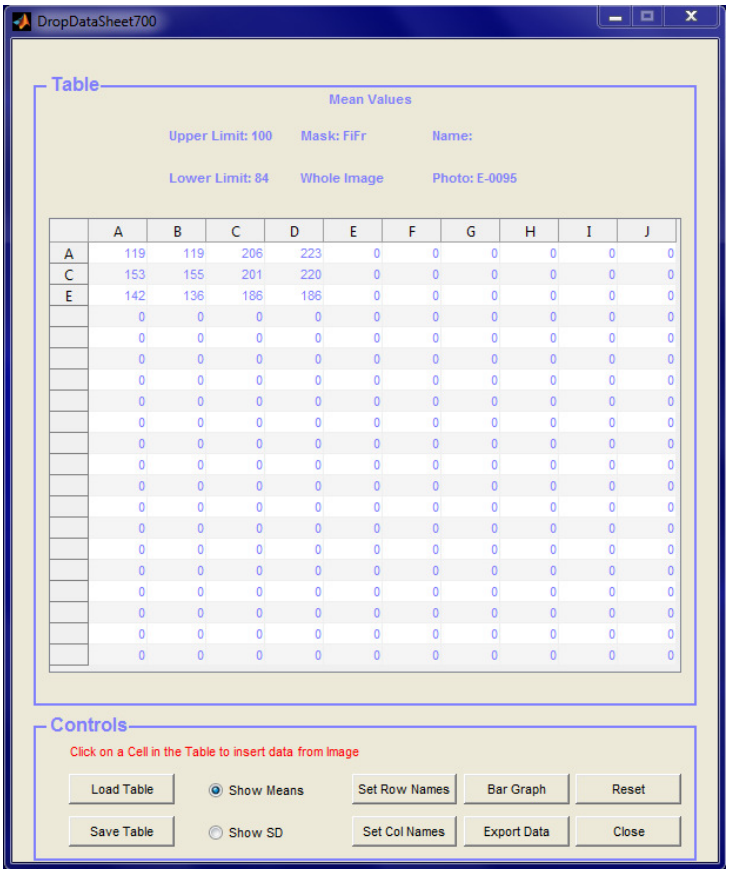
16. Click the **Show SD** radio-button to display the standard deviation values in the **Table**.

17. Click the **Clear All** button to clear all edit boxes.

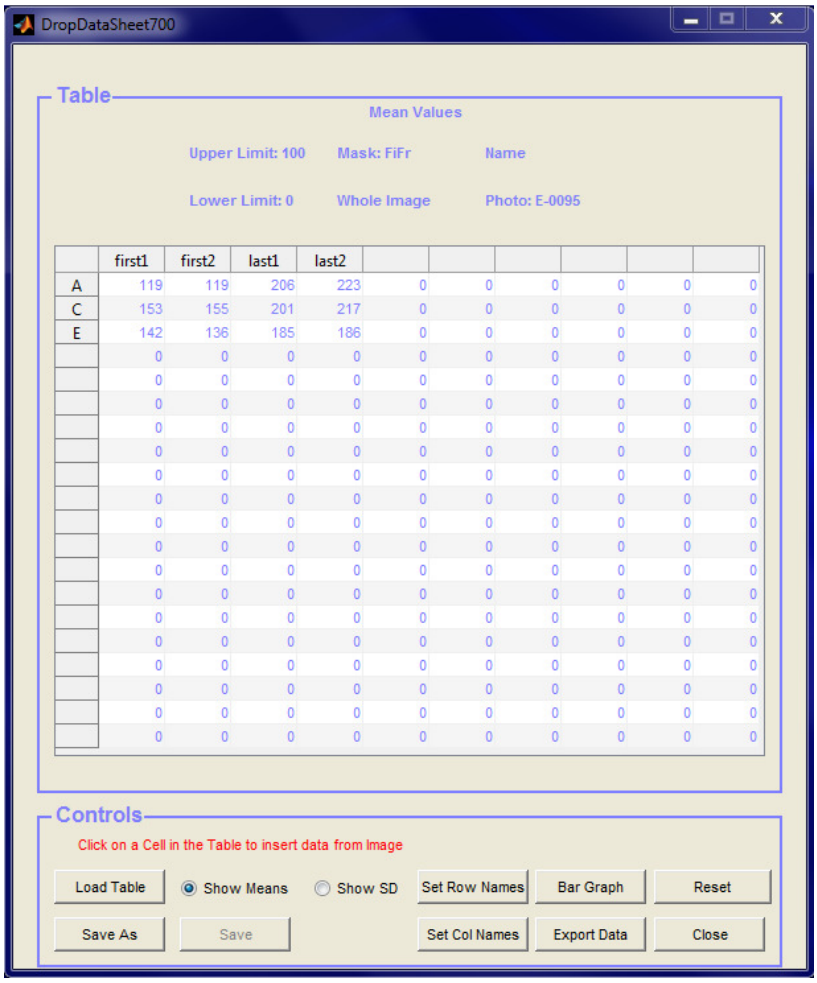
18. Click the **Set Row Names** button and insert the names of the files in the corresponding edit boxes.



19. Click the **OK** button. The **DropDataSheet 700** should now look like:



20. Click the **Set Col Names** button, click the **Clear All** button and insert the appropriate column names. Click the **OK** button.

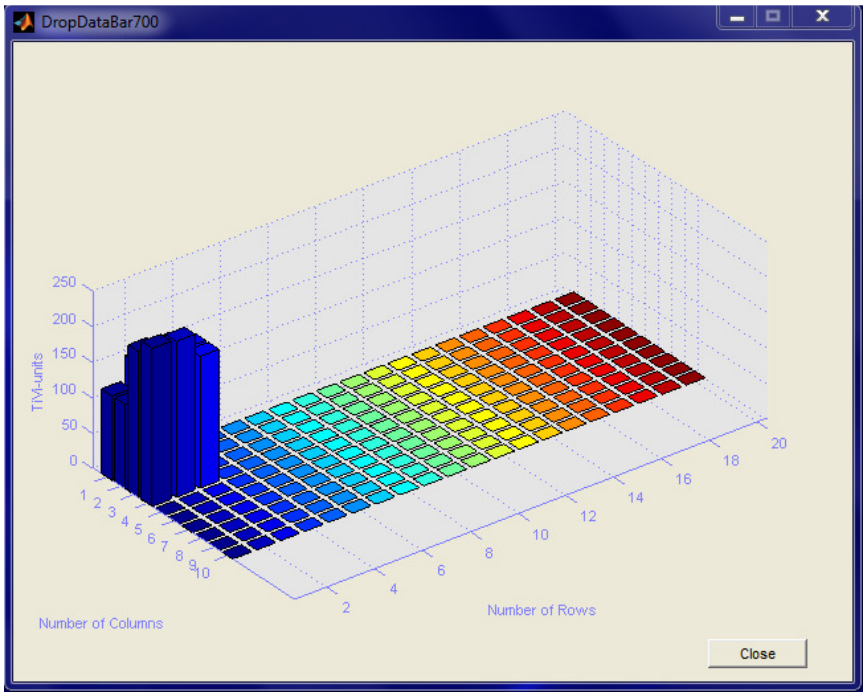


21. Click the **Save As** button and save the table under a selected name and folder.

22. Mark the cells holding numerical values and click the **Reset** button to empty the spread-sheet of data.

23. Click the **Load Table** button and load the saved table again.

24. Click the **Bar Graph** to display data as a Bar Graph.



25. The graph can be rotate by placing the mouse pointer in the diagram, pressing the left mouse button and moving the mouse. Click the **Close** button.

26. Click the **Export Data** button to save the Table as an **Excel** document.

27. Click the **Close** button to close the **DropDataSheet700** window.

Detailed description of **DropData:**

DropData settings:

1. **Number of Rows** edit box – to insert the actual number of rows in the **DropData Sheet700** (up to 20).

2. **Number of Columns** edit box – to insert the actual number of columns in the **DropDataSheet700** (up to 10).

3. **OK** button – to open a new **DropDataSheet700**

DropDataSheet700:

1. **Table –** fully editable table of max 20 x 10 dimension. **Rows** and **Columns** heading can hold alpha-numerical data while the spread-sheet cells can hold only numerical data. Clicking on a cell in the spread-sheet will automatically import and display the actual mean value (or standard deviation) of the image in focus in the **TiVi700 Analyzer**. The width of a cell can be changed by pointing to the separator line in the

column heading, pressing the left mouse button and moving the point to a new position.

2. Values above the spread-sheet displays the actual image **Upper Limit** and **Lower Limit** settings, the **Mask** setting and if the image is cropped as wells as the name of the actual photo and the name of the **DropDataSheet700** (if saved).

3. **Save As** button – to save the **Table** under a user selected name.

4. **Save** button - to save the Table under the name selected with **Save As**.

5. **Load Table** button **–** load a saved **Table**.

6. **Show Means** radio-button **-** to display the actual image mean values.

7. **Show SD** radio-button **-** to display the actual image standard deviations.

8. **Set Row Names –** to open the **Row** editor window in which names of the rows can be inserted.

9. **Set Col Names –** to open the **Column** editor window in which names of the columns can be inserted.

10. **Bar Graph** – to open the **Bar Graph** window.

11. **Export Data** – to export spread-sheet data to an **Excel** document.

12. **Reset** – to reset the content of the table. Select an area by pointing at the first cell. Press the mouse button and the drag the mouse to a new cell thereby defining the area. Release the mouse button. The defined area of cells now is displayed in blue background colour. Click the **Reset** button. Alternatively cells can be selected by use of the Shift tangent. If the content of a single cell is to be deleted, point at the cell and print “0” in the cell edit box.

13. **Close** – to close the DropDataSheet700.

Part 24 Organizer

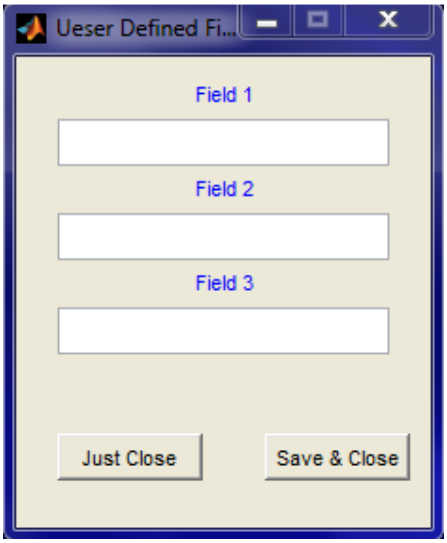
1. Select **Organizer** under the **DropData** pull-down menu. The **Organizer 700** welcome window open.

2. Click the **New Organizer** button to open a new **Organizer**.

3. Print ***Methyl Nicotinate*** in the **Substance Selected** edit box.

4. Print *This is my first Organizer project* in the **Comment** area

5. Click the **User Defined Fields** button to open the **User Defined Fields** window.

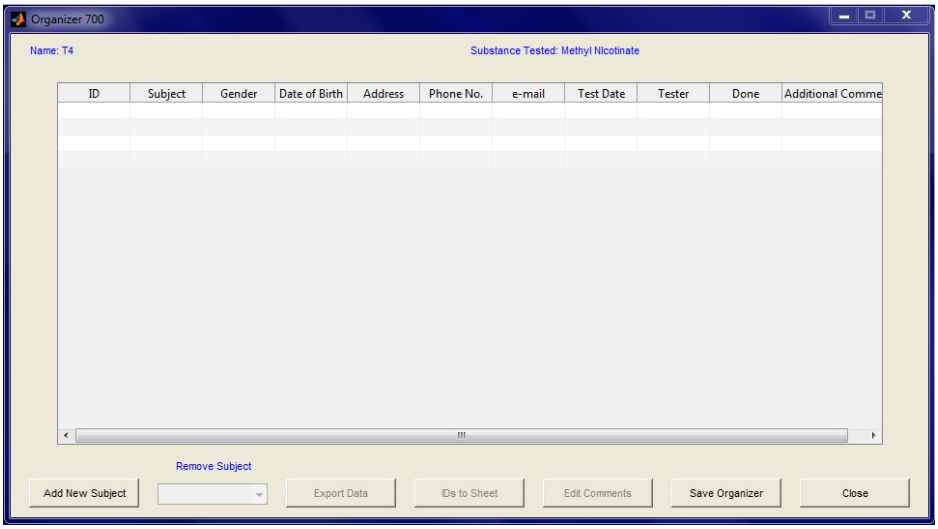


6. Print 'Additional Comments' in the **Field 1** edit box. Leave the other edit boxes blank.

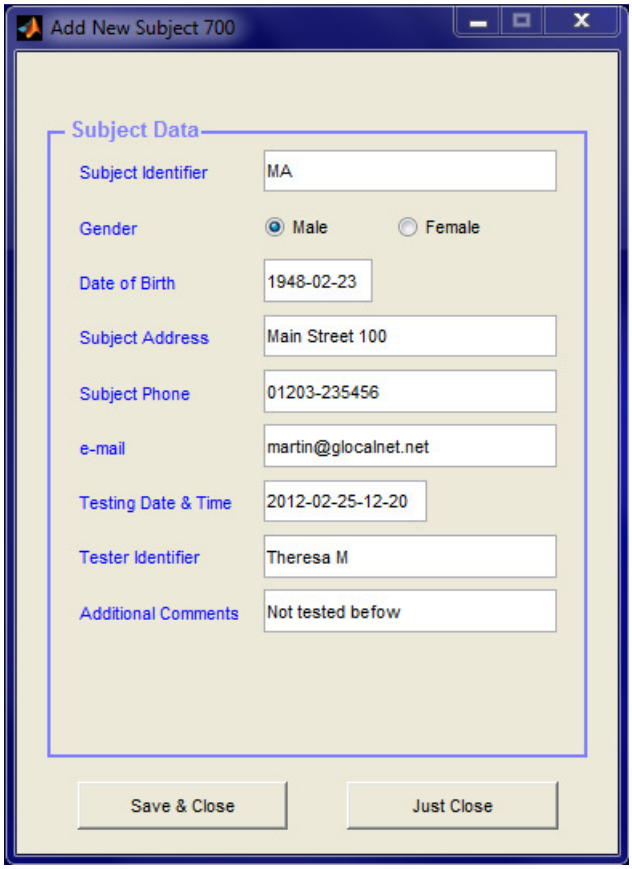
7. Click the **Save & Close** button.

8. In the **New Organizer 700** window click the **Create New and Save** button.

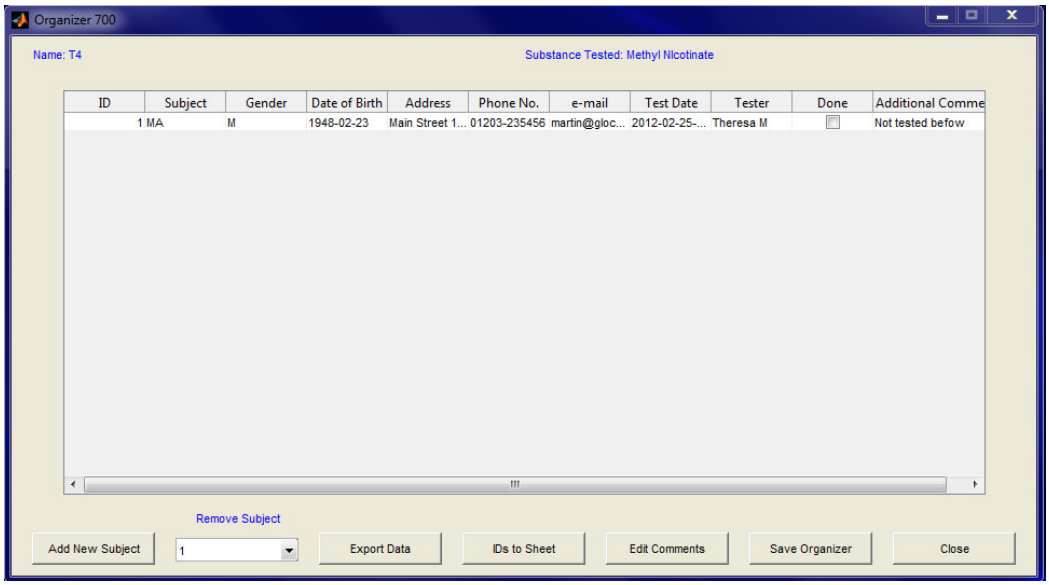
9. Save the **Organizer** under a selected name (e.g. T4) and folder. **The Organizer 700** named T4 now opens.



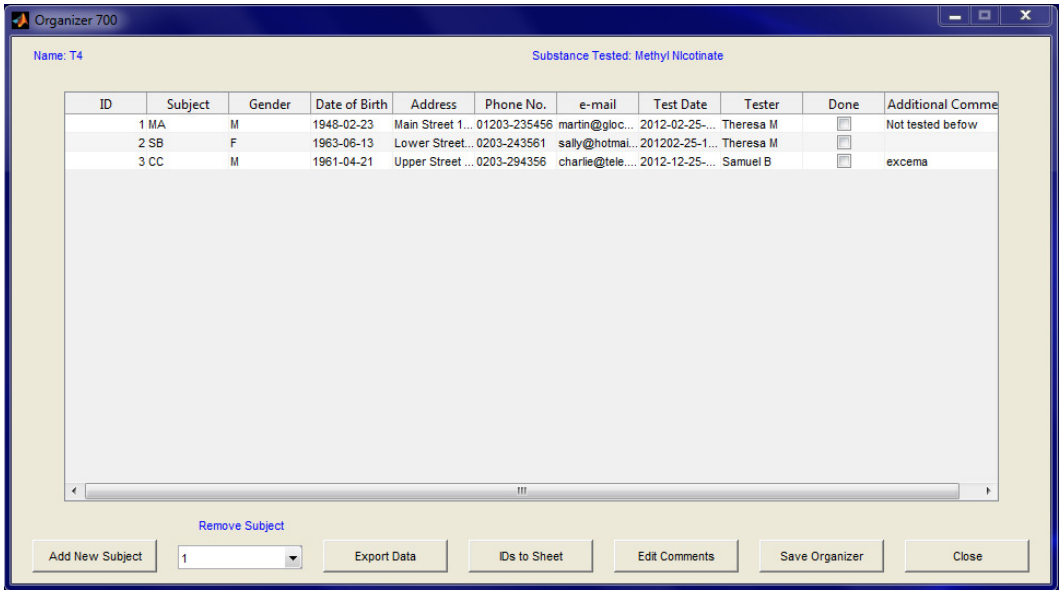
10. Click the **Add New Subject** button to add data for a new subject to the T4-table. The **Add New Subject 700** now opens. Fill out Subject data.



11. Click the **Save & Close** button. The **Organizer 700** window should now look like:



12. Fill out data for two more subjects accordingly.



13. Click the **Save Organizer** to save the **Organizer** spread-sheet.

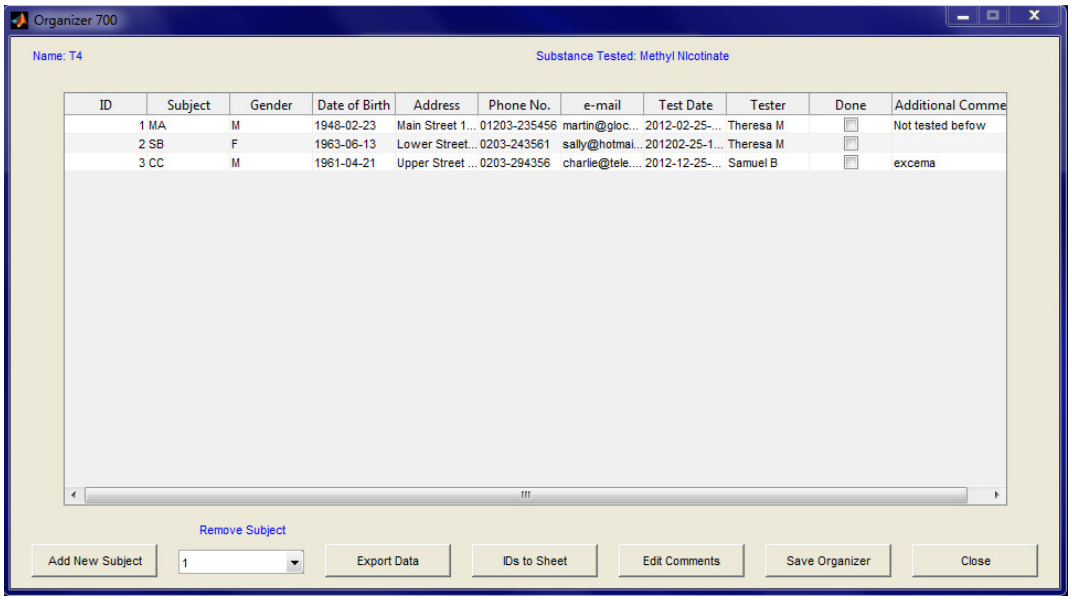
14. Click the **Export Data** button to export data to an **Excel** spread-sheet.

15. Click the **Close** button to close the **Organizer** window.

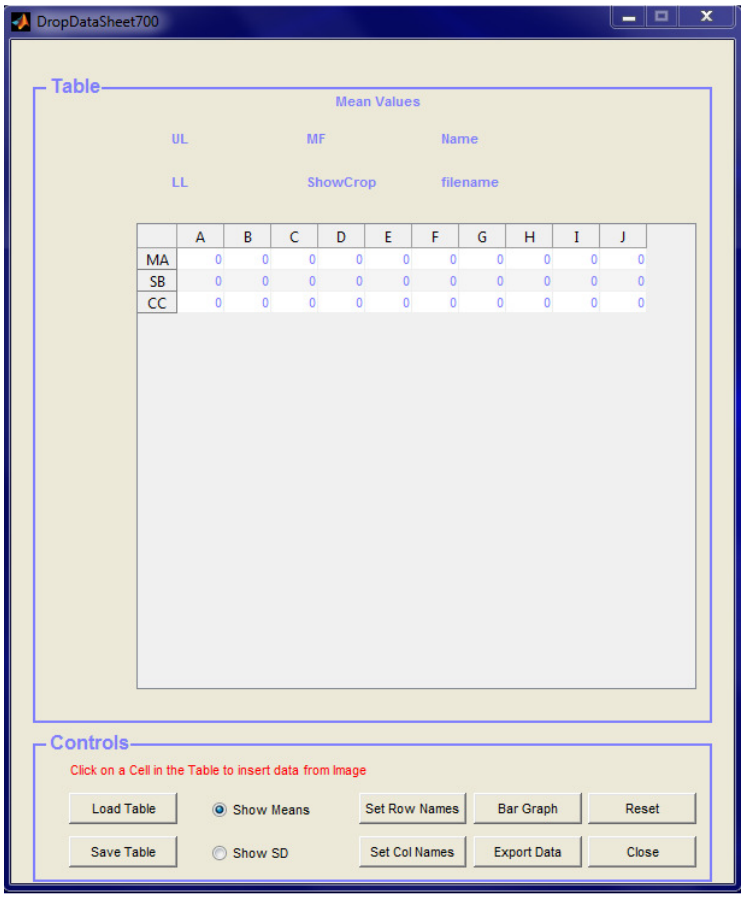
16. In the **TiVi700 Analyzer** window, click the **First Photo** button and load the *A-0001.jpg* file.

17. Select **Organizer** from the **DropData** pull-down menu.

18. In the **Organizer700** window, click the Open Organizer and select the Organizer just saved (T4).



19. Click the **IDs to Sheet** button to open the **DropData 700** window with the subject identifiers imported.



20. Place the **DropData700** window next to the **TiVi700 Analyzer** window.

21. Click **Set Col Names** button and insert appropriate column names.

22. Transfer image data from the **TiVi700 Analyzer** to the spreadsheet (see section **DropData** above).

Detailed description of **the Organizer:**

Organizer700 settings window:

1. **New Organizer –** to open a new **Organizer**.
2. **Open Organizer –** to open a saved **Organizer**.
3. **Close –** to close the Organizer700 window.

New Organizer 700 window.

1. **Substance Tested** - insert the name of the substance tested here.

2. **Comment** – insert comments regarding the study.

3. **User Defined Fields** - in addition to the standard fields in the **Organizer**, three optional fields can be inserted. The names of these fields are inserted in the edit boxes of the **User Defined Fields** window.

4. **Create New and Save** – to create and save a new **Organizer**.

5. **Close** – to close the **New Organizer 700** window.

Organizer 700:

1. **Table** – holds data regarding subject ID (number) and Subject Identifier, Gender, Date of Birth, Address, Phone Number, e-mail, Test Data, Tester ID, Done (to check when the test for the actual subject is complete) and up to three user-defined fields. The table is fully editable.

2. **Add New Subject** – opens window for including a new subject in the **Organizer.** This is done through the **Add New Subject 700** window in which data of Subject Identifier, Gender, Date of Birth, Subject Address, Subject Phone Number, e-mail, Testing Date and Time, Tester Identifier n additional user-defined fields. Clicking **Save & Close** automatically insert the data into the **Organizer**.

3. **Remove Subject** – to remove a subject from the **Organizer**. The unique subject ID number is not changed by this procedure.

4. **Export Data** – to export the content of the **Organizer** to an **Excel** spread-sheet.

5. **IDs to Sheet** – to export the subject ID data to a new **DropDataSheet** which is automatically generated and opened.

6. **Edit Comments** – to display and edit comments related to the project.

7. **Save Organizer** – saves the current content of the **Organizer.**

8. **Close –** to close the **Organizer.**

Part 25 Software Installation Procedure

If another version of TiVi700Analyzer is already installed, this must first be de-installed. Go to the Control Panel → Program (de-install a program) and select TiVi-1.1 Tissue Viability Imager (about 1GB) (or TiVi700Analyzer). Check "Yes" to de-install.

Move the folder named **TiVi700Analyzer** to the install computer desktop from the installation USB memory stick.

1. Click the **TiVi700 Analyzer** software setup icon in the **TiVi700Analyzer** folder. The installer will start to extract the **TiVi700Analyzer.msi** file.
2. Click the **Next** button in the Welcome to the InstallShield Wizard for **TiVi700Analyzer**.
3. Read the *License Agreement*. Check the *"I accept the terms in the License agreement"* radio-button to continue with the installation procedure.
4. Click the **Next** button.
5. Click the Install button to install the software in the C:\Program Files (x86)\Wheelsbridge\TiVi700Analyzer folder.
6. When the User Control Icon is displayed click on it.
7. In the *User Account Control* click "*Yes*". The files will start to extract (will take about a minute or two.
8. In the TiViAnalyzer – InstallShield Wizard check the Launch the Program checkbox (if not already checked. Click the Finish button.
9. IN the User Account Control click the "Yes" button to start installation of the MATLAB libraries. The Winzip Self-Extractor – MCRINstaller.exe starts to extract the library files.
10. In the *MATLAB Runtime Installer* click the **Next** button.
11. Click the "*Yes*" radio button in the *License Agreement* and the click the **Next** button to start the installation of the MATLAB libraries.
12. Click the Next button in the Folder selection window.
13. Click "Yes" in the Folder Selection window as answer to the question " Would you like to create it?"
14. Click the **Install** button in the *Confirmation* window to start the installation (will take several minutes).
15. Click the **Finish** button to complete the installation process.
16. To start the **TiVi700 Analyzer** click the *Launch TiVi700Analyzer* icon on the desktop.

If the program does not start correctly the *Wheelsbridge* window is probably not set up for reading and writing by the User. Proceed as follows to set the *Wheelsbridge* folder correctly:

1. Right-click the *Wheelsbridge* folder located in the *Program (x86)* folder and select *Properties*.
2. Select the **Security** tab.
3. In the upper combo text box select *User* and check if permission to read and write to the folder is granted (lower combo text box).
4. If not select *Edit*, select *User* in the upper combo text box.
5. Check permission to read and write in the lower combo text box.

6. Click *OK*.
7. The User can now read and write to the *Wheelsbridge* folder.