



# PIPSPRO™ SOFTWARE

**Version 5.2**

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## **Quick Start Guide**

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Mar / 2015 ©2015 Standard Imaging, Inc.

DOC # 80714-01

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## General Precautions

**Warnings and Cautions alert users to dangerous conditions that can occur if instructions in the manual are not obeyed. Warnings are conditions that can cause injury to the operator, while Cautions can cause damage to the equipment.**



**CAUTION:**

Federal law in the U.S.A., and Canadian law, restricts the sale distribution, or use of this product to, by, or on the order of a licensed medical practitioner. This product should be used under the guidance of a medical physicist.



**CAUTION:**

The “Save” and “Save As” functions of the PIPSPRO System are intended solely to save solutions of interest or potential reuse. Specific patient information or identifiers should not be saved using these functions.



**CAUTION:**

To minimize the potential for computer issues, do not run PIPSPRO concurrently with other software programs.



**CAUTION:**

Proper use of this product depends on careful reading of all instructions and labels.



**CAUTION:**

For accurate results in the MLC QA Module the MLC QA Phantom must be positioned carefully to ensure that the corner spherical marker is aligned to isocenter and that the supporting arm is perpendicular to the gantry rotation.



**CAUTION**

The MLC module expects all tests to be performed with the collimator at either 0, 90, 180 or 270 degrees. Collimator angle accuracy should be verified before acquiring images for analysis in the MLC module. Variance in the expected angle could result in incorrect positions being reported for individual MLC leaves.



**WARNING:**

Issues identified through the use of this product must be investigated and appropriately resolved and/or noted.



**WARNING:**

Proper application of the QC-3 Phantom, QCKV-1 Phantom and/or FC-2 Phantom requires the use of the PIPSPRO Software.



**WARNING:**

Where applicable, Standard Imaging products are designed to be used with the versions of common radiation delivery devices, treatment planning systems and other common computer software products or systems used in the delivery of ionizing radiation, available at the time the Standard Imaging product is released. Standard Imaging does not assume responsibility, liability and/or warrant against, problems with the use, reliability, safety or effectiveness that arise due to the evolution, updates or changes to these products or systems in the future. It is the responsibility of the customer or user to determine if the Standard Imaging product can be properly used with these products or systems.



**CAUTION:**

For professional use only. As desired by IAEA, English is the default language for labeling and manuals. If translated versions are available, resolve any difference in favor of the English versions.

## Introduction

This Quick Start Guide provides basic instruction for how to use the PIPSPRO software. This includes a one-page guide for each module, in the following order:

1. Imager QA
2. Radiation Light Field
3. StarShot
4. Stereotactic
5. MLCQA
6. IGRT
7. Leaf Speed

Please note that this guide only includes the basic instructions for each module, and does not include every possible detail or function. For more in-depth information (including installation/setup) refer to the main PIPSPRO User Manual.

# Imager QA

Imager QA is designed to analyze flat panel planar and CT (Cone-beam and Diagnostic) images for quality assurance and to track possible changes in performance over time.

## 1 Phantom Setup

**Planar:** Align QC-3, QcKV, or QcKV-R phantom at a 45 degree angle, so that the number '1' on the phantom faces the gantry. Lines and marks on the surface of the phantom assist aligning it with the central beam line. If using the TOR-18 phantom, it should be set up according to manufacturer recommendations.

Acquire MV images with 3-5 MU. Acquire kV images with 70-100 kV and the lowest exposure (mAs) settings.

**CBCT:** Images can be acquired with the CatPhan® model 503, 504, and 600 phantoms. Set up the phantom according to the manufacturer's instructions.

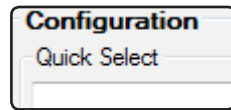
Acquire images using 2.5 mm slices and the smallest field (highest resolution) available.

## 2 Image Analysis

1. Open Imager QA by selecting **Application> Imager QA** from the main menu.



2. Select a **Quick Select** profile, or enter machine information.

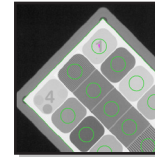


3. Use buttons in the left panel to load images:

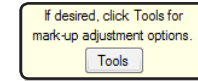
**Planar:**  
[Phantom] and [Flood Field]  
- or -  
[Phantom] and [Phantom]

**CBCT:**  
[CT Series]

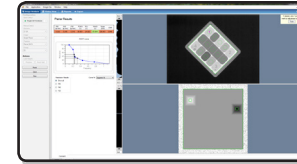
4. Edge and ROI markups will be placed in automatically.



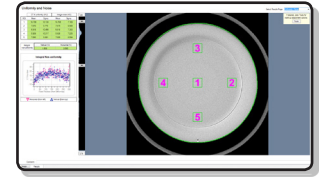
5. If needed, adjust markups using the controls located on the right panel.



6. Results will be displayed in a new tab page within the Image Analysis view.



CBCT Results: Use the drop down menu in the upper right to navigate between multiple pages of results.

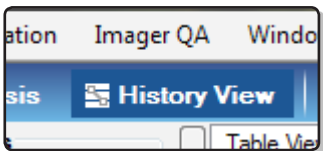


7. To save results to the database, select [Save].

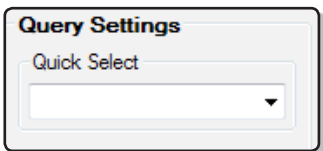
To discard results and try again, select [Reset].

## 3 History View

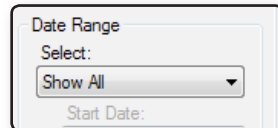
1. Select the History View tab.



2. Select a Quick Select profile.



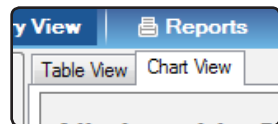
3. Select the desired Date Range using the available pre-sets, or select specific calendar dates.



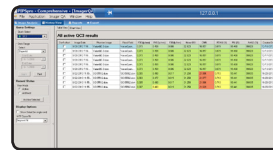
4. Choose to view either Active or Archived records.

5. Select [Apply], and data will be displayed as specified.

6. Use the Table and Chart Tabs to switch between views.



### Table View



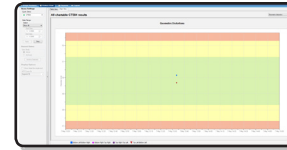
To view details about a specific record, select the Show Detail check box.

To exclude a record from being displayed in the chart, select the associated "Don't Chart" check box.

To archive data that are not relevant, select it in the Table, and select [Archive] in the left panel.

To re-activate an archived record, select it in the archived Table and select [Activate].

### Chart View

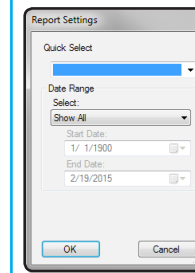


To zoom in on an area of the chart, click and drag across the section use the or buttons to zoom out again.

### Table and Chart

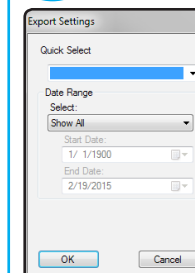
CBCT trends will be displayed on more than one table or chart. Use the drop down menu in the upper right to navigate between multiple pages of results.

## 4 Report



Select the Report tab. In the resulting dialog, select the desired Quick Select profile. Adjust calendar and active/archived settings as needed, then select [OK]. A Print Preview dialog will be displayed. Select Save or Print as desired.

## 5 Export



Select the Export tab. In the resulting dialog, select the desired Quick Select profile. Adjust calendar and active/archived settings as needed, then select [OK].

A Save As dialog will be displayed. Choose a directory and select [Save].

## 1 Phantom Setup

Acquire images using 3 - 5 MU.

## 2 Image Analysis

The screenshot shows the 'Linux Select' dialog box. On the left, a tree view under 'Demo/Global' has 'Demo/Linux 2' selected. On the right, several fields are populated: 'Department' is 'Demo/Data', 'Unit' is 'Beltis Linux 1', 'Manufacturer' is 'Beltis Technology', and 'Model' is 'Spring'. At the bottom are 'Select' and 'Cancel' buttons.

**Analysis**

Calculate

Print

Save

[illegible]

To discard the results and try again, select [Reset].

### 3 History View



History View

The screenshot shows a 'Linac Select' dialog box. On the left, a tree view under 'Demo' has 'Elekta' selected, which contains three items: 'Elekta Linac 1', 'Elekta Linac 2', and 'Elekta M3'. On the right, there are four labeled text fields: 'Department:' with 'Demo/Elekta', 'Linac:' with 'Elekta Linac 1', 'Manufacturer:' with 'Elekta Oncology', and 'Model:' with 'Synergy'. At the bottom are 'Select' and 'Cancel' buttons.

Date Range  
Select:  
Show All ▼  
Start Date:

Start Date	Created Date	Image	Raw Light Data (Y, X)	Raw Light Data (Y, X)	Rotation (Clockwise X)	Rotation (Clockwise Y)	Light Data (Clockwise X)	Light Data (Clockwise Y)
9/5/2013 10:30:14 AM	10/10/2013	1.50	-0.76	-0.02	0.16	0.14	0.32	
9/10/2013 10:12:02 AM	10/24/2013	1.20	-0.76	-0.02	0.14	0.12	0.10	
12/15/2013 10:19:11 AM	10/10/2013	4.25	0.34	-0.03	0.25	0.25	0.51	
12/15/2013 10:29:27 AM	10/10/2013	4.25	0.34	-0.03	0.25	0.25	0.51	
12/15/2013 10:47:47 AM	10/10/2013	5.50	-0.76	-0.02	0.14	0.14	0.32	
12/12/2013 10:29:55 AM	10/10/2013	1.20	-0.76	-0.02	0.14	0.14	0.32	

To re-activate an archived record, select it in the archived Table and select [Activate].

To zoom in on an area of the chart, click and drag across the section use the  or  buttons to zoom out again.

## 4 Report

**Generate Report-Varian Linac 1**

**Date Range**

Select: Show All

Start Date: 1/ 1/2000

End Date: 1/ 1/2000

**Test Type**

☒ 10 X 10 ☐ 10 X 10 Adv. ☐ 15 X 15 ☐ 15 X 15 Adv.

Generate Cancel

## 5 Export

**Export Records-Elekta Linac 1**

**Date Range**

Select:

Show All

Start Date:

1/ 1/2000

End Date:

1/ 1/2000

**Test Type**

☒ 10 X 10 ☐ 10 X 10 Adv.

☐ 15 X 15 ☐ 15 X 15 Adv.

Export Cancel

# StarShot

Use StarShot images to establish the diameter of the center of rotation for the linac gantry, couch, or collimator.

## 1 Phantom Setup

Both gantry and couch StarShot images need to be acquired on film (standard radiographic or radiochromic). Close lower collimators to form a narrow slit and through which radiation is delivered at multiple angles.

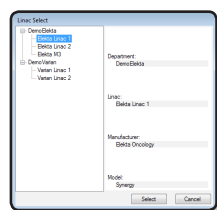
Scan film as a grayscale image with a resolution of 72 - 96 dpi. Save in a lossless image format, such as bitmap (.bmp).

Note: If separate images were acquired for each angle, the images will need to be combined using PIPSPRO image processing tools.

## 2 Image Analysis

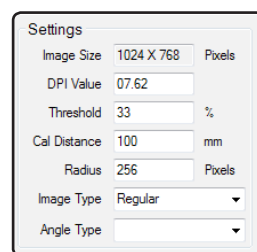
1. Open StarShot by selecting **Application> StarShot** from the main menu.

2. Use the Linac Select tab as resulting dialog to indicate the department and linac the data corresponds to.

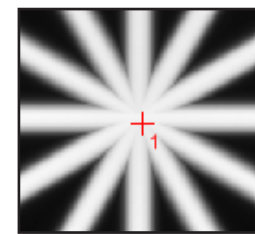


3. Select StarShot>Load Image in the main menu. Select the desired image.

4. Under 'Settings', select the Angle Type from the drop down menu.

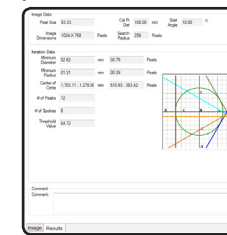


4. Place a single fiducial marker by clicking on the image. The marker should be placed near the center of the intersecting projections.



5. Select [Calculate]. (Markups will be placed automatically.)

6. Results will be displayed in a new tab page within the Image Analysis view.

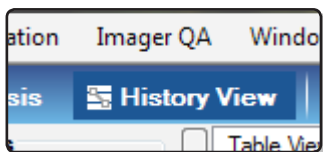


7. To save results to the database, select [Save].

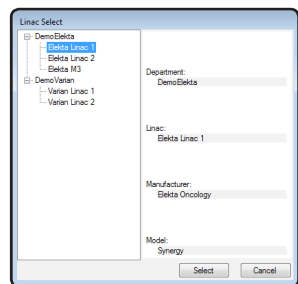
To discard results and try again, select [Reset].

## 3 History View

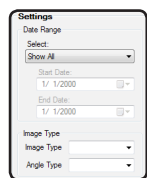
1. Select the History View tab.



2. Select a linac.



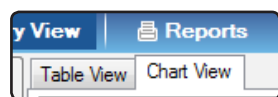
3. Select the desired Date Range and Image Type controls to specify which data to display.



4. Choose to view either Active or Archived records.

5. Select [Apply], and data will be displayed as specified.

6. Use the Table and Chart Tabs to switch between views.



### Table View

New View - (Load View)

All Active Regular Collimator Tests

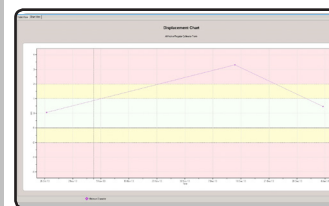
Test	Created Date	Image	Minimum Radius (mm)	Minimum Diameter (mm)	Manual Mode	User
1	9/10/2013 10:30	Test with human	55.44	55.88	No	Super User
2	9/10/2013 12:26	Test with human	55.44	55.88	No	Super User

To exclude a record from being displayed in the chart, select the associated "Don't Chart" check box.

To archive data that are not relevant, select it in the Table, and select [Archive Selected] in the left panel.

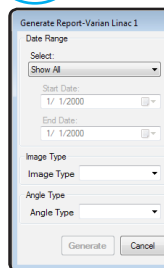
To re-activate an archived record, select it in the archived Table and select [Activate].

### Chart View



To zoom in on an area of the chart, click and drag across the section use the or buttons to zoom out again.

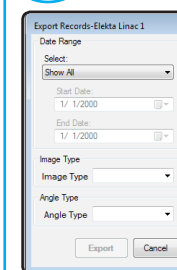
## 4 Report



Select the Report tab. Select the desired linac when prompted. In the following Reports dialog, adjust calendar and active/archived settings as needed, then select [OK].

A Print Preview dialog will be displayed. Select Save or Print as desired.

## 5 Export



Select the Export tab. Select the desired linac when prompted. In the following Export dialog, adjust calendar and active/archived settings as needed, then select [OK].

A Save As dialog will be displayed. Choose a directory and select [Save].

# Stereotactic

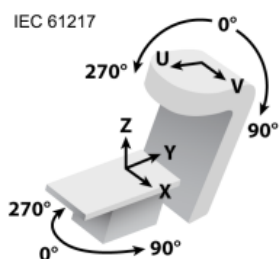
Perform a Winston-Lutz style test and track changes over time.

## 1 Phantom Setup

Align a spherical Winston-Lutz style phantom at isocenter as defined by the light field crosshairs. Collimate the treatment beam with a stereotactic cone or MLC. Acquire 8 separate images at differing gantry and couch angles. The recommended angles are as follows:

### Gantry Couch

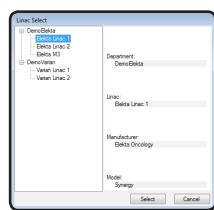
60	0
130	0
230	0
300	0
60	270
130	270
230	90
300	90



## 2 Image Analysis

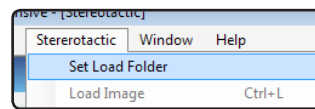
1. Open Stereotactic by selecting **Application> Stereotactic** from the main menu.

2. Use the Linac Select tab and resulting dialog to indicate the department and linac the data corresponds to.

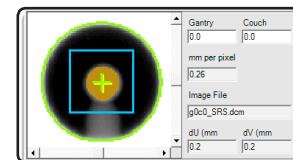


3. Select a folder to load images from via Stereotactic>Set Load Folder in the main menu.

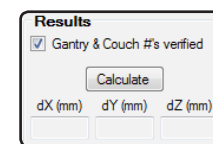
4. Auto-Load images by selecting Stereotactic>Auto-Load Images, or load images manually by selecting an image box and image file from the browse list, then Stereotactic>Load Image.



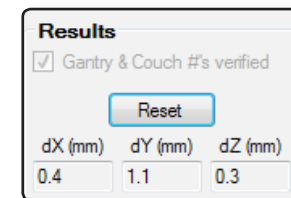
5. Markups will be placed automatically. Enter values as needed.



6. Verify the Gantry and Couch angles, then select [Calculate].



7. Results will be displayed in the lower left corner of the Image Analysis view.

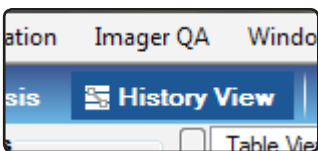


8. To save results to the database, select [Save].

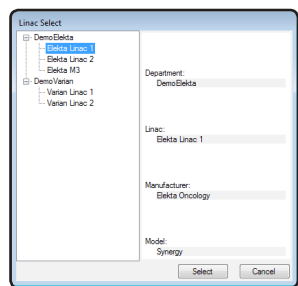
To discard results and try again, select [Reset].

## 3 History View

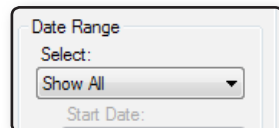
1. Select the History View tab.



2. Select a linac.



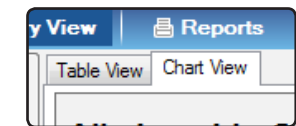
3. Select the desired Date Range using the available pre-sets, or select specific calendar dates.



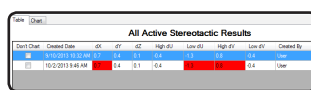
4. Choose to view either Active or Archived records.

5. Select [Apply], and data will be displayed as specified.

6. Use the Table and Chart Tabs to switch between views.



### Table View



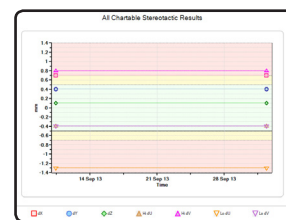
To view details about a specific record, select the Show Detail check box.

To exclude a record from being displayed in the chart, select the associated "Don't Chart" check box.

To archive data that are not relevant, select them in the Table, and select [Archive] in the left panel.

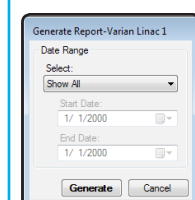
To re-activate an archived record, select it in the archived Table and select [Activate].

### Chart View



To zoom in on an area of the chart, click and drag across the section use the or buttons to zoom out again.

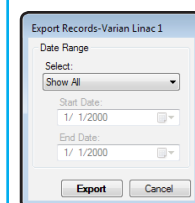
## 4 Report



Select the Report tab. Select the desired linac when prompted. In the following Reports dialog, adjust calendar and active/archived settings as needed, then select [OK].

A Print Preview dialog will be displayed. Select Save or Print as desired.

## 5 Export



Select the Export tab. Select the desired linac when prompted. In the following Export dialog, adjust calendar and active/archived settings as needed, then select [OK].

A Save As dialog will be displayed. Choose a directory and select [Save].



# MLC QA

Use multiple tests to analyze the accuracy of the multi-leaf collimator and track its performance over time.

Tests include: **Leaf Position**, **Multi-Port**, **Leaf Transmission**.

## 1 Phantom Setup

Using the In-Air Comparison Jig, position the MLC phantom with the isocenter so that the Couch will not be in the way of the treatment beam. Note that the phantom has 5 radio opaque spheres in an 'L' shape. The sphere in the corner of the 'L' should be aligned to isocenter using in-room lasers.

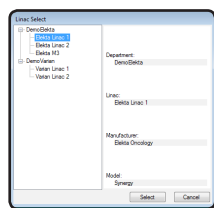


Refer to the PIPSPRO User Manual for details about test-specific MLC configurations.

## 2 Image Analysis

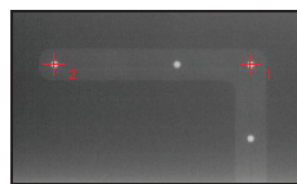
1. Open MLCQA by selecting **Application> MLCQA** from the main menu.

2. Use the Linac Select tab and resulting dialog to indicate the department and linac the data corresponds to.



3. Select MLCQA>Load Image in the main menu. Load the image file for the test you wish to perform.

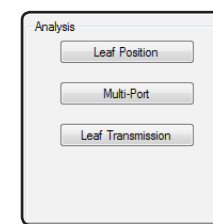
4. Place two fiducial markers by clicking the appropriate spots on the image.



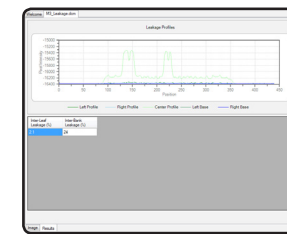
1<sup>st</sup> marker = center

2<sup>nd</sup> marker = furthest from center.

5. Select the button corresponding to the test you wish to perform.



6. Results will be displayed in a new tab page within the Image Analysis view.

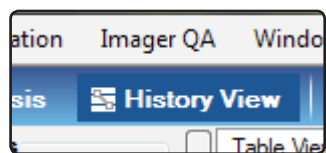


7. To save results to the database, select [Save].

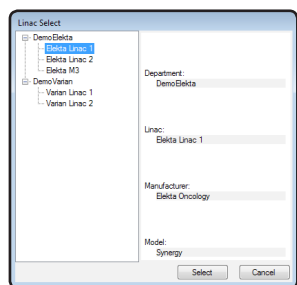
To discard results and try again, select [Reset].

## 3 History View

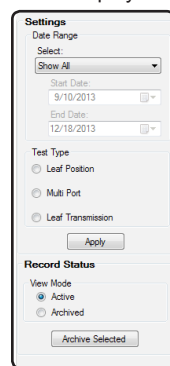
1. Select the History View tab.



2. Select a linac.



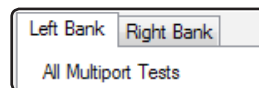
3. Select the desired Date Range and Image Type controls to specify which data to display.



4. Choose to view either Active or Archived records.

5. Select [Apply], and data will be displayed as specified.

6. Use the tabs at the top of the History View to view either Left or Right Bank data.



### Table View

Test	Leaf 1	Leaf 2	Leaf 3	Leaf 4	Leaf 5	Leaf 6	Leaf 7	Leaf 8	Leaf 9	Leaf 10	Leaf 11
Leaf 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Leaf 11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

To see the chart for a particular leaf, select the associated checkbox in the Trend Leaf column. The chart will be displayed directly below the table.

To archive data that are not relevant, select it in the Table, and select [Archive] in the left panel.

To re-activate an archived record, select it in the archived Table and select [Activate].

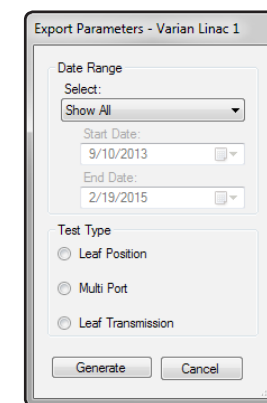
### Chart View



To zoom in on an area of the chart, click and drag across the section use the or buttons to zoom out again.

## 4 Export

Select the Export tab. In the resulting dialog, select the desired Date Range and Test Type. Adjust calendar and active/archived settings as needed, then select [OK].



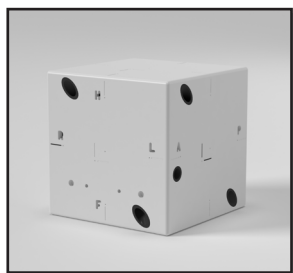
A Save As dialog will be displayed. Choose a directory and select [Save].

# IGRT

Using the MIMI phantom, track deviations in coincidence of imaging and radiation isocenters.

## 1 Phantom Setup

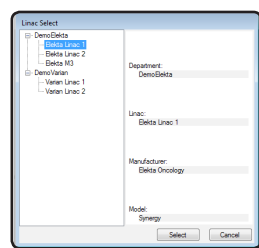
Place the MIMI phantom on the couch and align with the isocenter using the lasers. Acquire a set of 2D or 3D projections images, and analyze them with the linac's image analysis system 2D/2D or 3D/3D matching algorithm. This will provide the X, Y, and Z offsets of the phantom compared to the reference image.



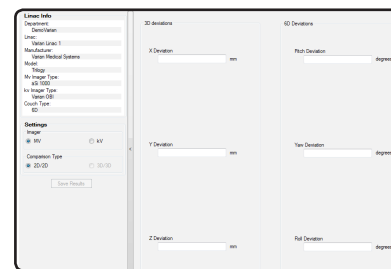
## 2 Image Analysis

1. Open IGRT by selecting **Application> IGRT** from the main menu.

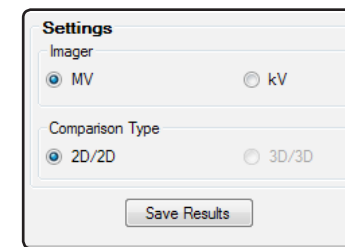
2. Use the Linac Select tab and resulting dialog to indicate the department and linac the data corresponds to.



3. No images are used in the IGRT module. Instead, enter deviation values determined by the linac's image analysis system into the appropriate fields.



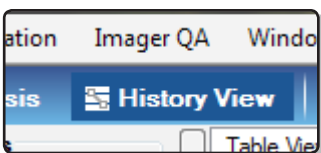
4. When ready, select [Save Results].



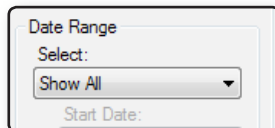
The data will be saved to the database and available for review in the History View.

## 3 History View

1. Select the History View tab.



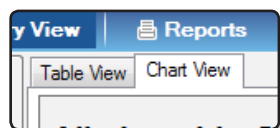
3. Select the desired Date Range using the available pre-sets, or select specific calendar dates.



4. Choose to view either Active or Archived records.

5. Select [Apply], and data will be displayed as specified.

6. Use the Table and Chart Tabs to switch between views.



### Table View

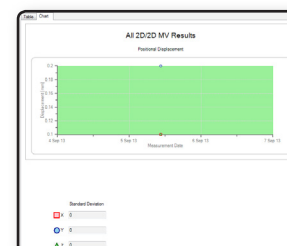
Start Show	Measurement Date	User	X Deviation	Y Deviation	Z Deviation
1	5/5/2013 10:25	Unknown	0.1	0.2	0.1

To exclude a record from being displayed in the chart, select the associated "Don't Show" check box.

To archive data that are not relevant, select it in the Table, and select [Archive] in the left panel.

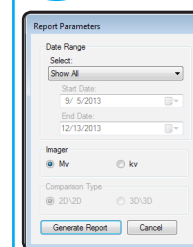
To re-activate an archived record, select it in the archived Table and select [Activate].

### Chart View



To zoom in on an area of the chart, click and drag across the section use the or buttons to zoom out again.

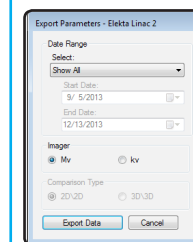
## 4 Report



Select the Report tab. In the resulting dialog, select the desired settings. Adjust calendar and active/archived settings as needed, then select [OK].

A Print Preview dialog will be displayed. Select Save or Print as desired.

## 5 Export



Select the Export tab. In the resulting dialog, select the desired settings. Adjust calendar and active/archived settings as needed, then select [OK].

A Save As dialog will be displayed. Choose a directory and select [Save].



# Leaf Speed

Use the Leaf Speed module to calculate "Loss of Leaf Speed" as specified in TG-142, Table V for linear accelerators with Varian Millennium MLC's.

## 1 Concerning DynaLog Files

MLC QA using DynaLog files requires new methods of data acquisition as well as a basic understanding of the information in DynaLog files and how it is interpreted by PIPSpro.

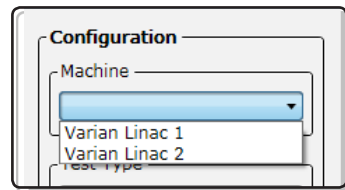
For further information, refer to the following in the PIPSpro user manual:

- Appendix C: Acquiring DynaLog Files
- Appendix D: DynaLog Files and Logfile Analysis

## 2 Logfile Analysis

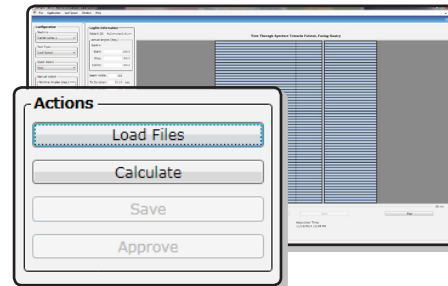
1. Open Leaf Speed by selecting **Application> Leaf Speed** from the main menu.

2. Use the Machine drop-down menu in the left panel to specify the machine your files were created with.



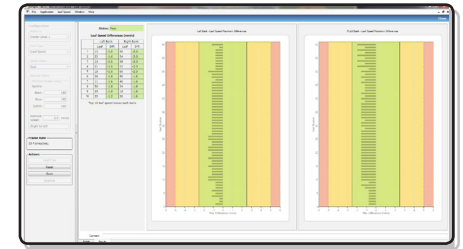
3. Select [Load File]. A browser will open which pre-interprets your logfile pairs and presents valid pairs as a single entry in a table. Select the desired file, then select [Open].

Once loaded, PIPSpro will attempt to find a Quick Select that matches the selected files. If there is no matching Quick Select, you can create a new Quick Select after calculating and saving the results. Edit values in the Manual select box to match preferred nominal values as needed.



4. When ready, select [Calculate].

Results will be displayed in a new tab page within the Image Analysis view.



5. To save results to the database, select [Save]. To approve the saved results, select [Approve]. Only Physicists and Physicians may approve database results.

To discard unsaved results, select [Reset].