

# **UROVOID™ ANALYSIS**

SOF-581

USER'S MANUAL

**DOC-294**

**Rev. 1.1**

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## CHAPTER 1 - INTRODUCTION

Med Associates, Inc. designed UroVoid™ Analysis SOF-581 to view the large raw data files generated by UroVoid™ Acquisition SOF-580 and present the data in a user-friendly interface.

UroVoid Analysis imports data acquired with UroVoid Acquisition SOF-580 into a “Project” file. Using four user-set parameters (two time thresholds and two mass thresholds), UroVoid Analysis finds the micturitions (voids) in each chamber’s experiment session. These voids are displayed graphically in UroVoid Analysis as a Voiding Micturogram™ and a Histogram. The void data are also displayed numerically via a Summary table, and a Detail table.

UroVoid Analysis enables the researcher to apply different filters on the data, view the data in user selectable time bin periods, zoom and pan the data in a line chart (Micturogram), and export the data in a variety of formats. The features and functions of UroVoid Analysis make it possible for researchers to work with large amounts of data in a clear and concise manner.

## CHAPTER 2 – GETTING STARTED

### Software Installation

If the computer was purchased as part of a UroVoid system from Med Associates, the software installation was completed at the factory. If the computer was not purchased from Med Associates or was not a part of the system, follow the instructions below to install the software.

**Before beginning the software installation, please fax or e-mail Med Associates the software registration form in order to receive the software installation password. This password will be necessary during the software installation process.**

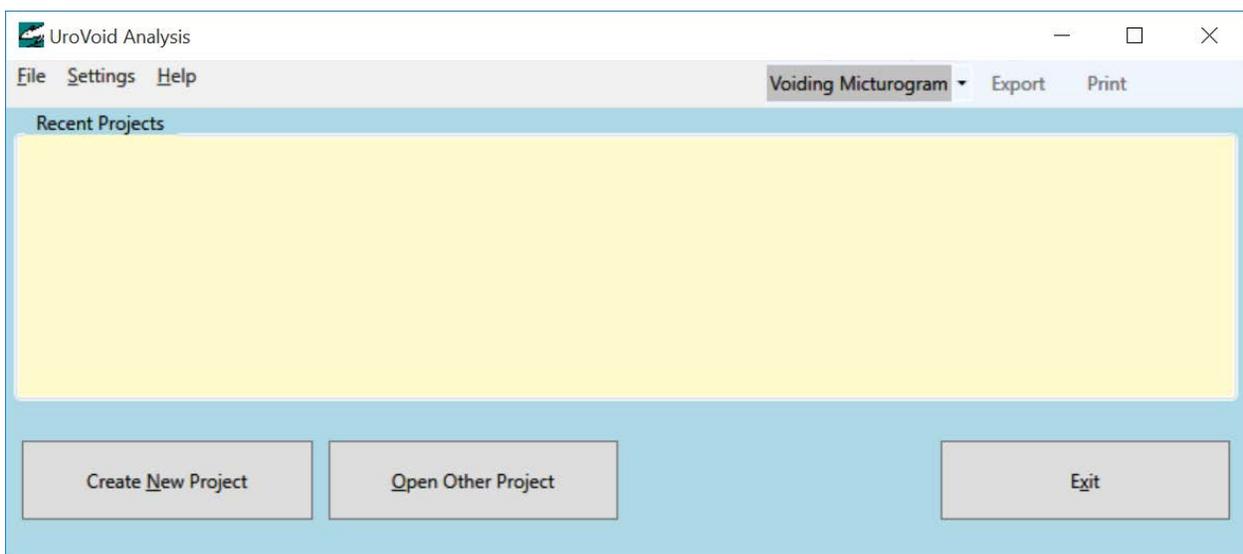
Insert the UroVoid CD into the optical drive. At the Welcome screen choose to install the UroVoid System (acquisition **and** analysis), UroVoid Acquisition only or UroVoid Analysis only. If the CD does not auto-start, navigate to the optical drive in Windows Explorer and double click “autorun.exe” to launch the Welcome screen. Successful installation of each component will be indicated by a green check mark, a red X will indicate an unsuccessful installation. When prompted enter the user name, company name and software installation password. Click Finish when the installation completes.

## CHAPTER 3 - UROVOID ANALYSIS PROJECTS

### Overview

Reviewing UroVoid Acquisition data in UroVoid Analysis can be done with or without creating a project file. Creating a project to perform data analysis in UroVoid Analysis is not required, but is recommended. Creating a project makes reanalyzing data more efficient. The project file stores the analysis and import information generated when the large raw data files generated by UroVoid Acquisition are imported to UroVoid Analysis, eliminating the need to perform this possibly lengthy process again.

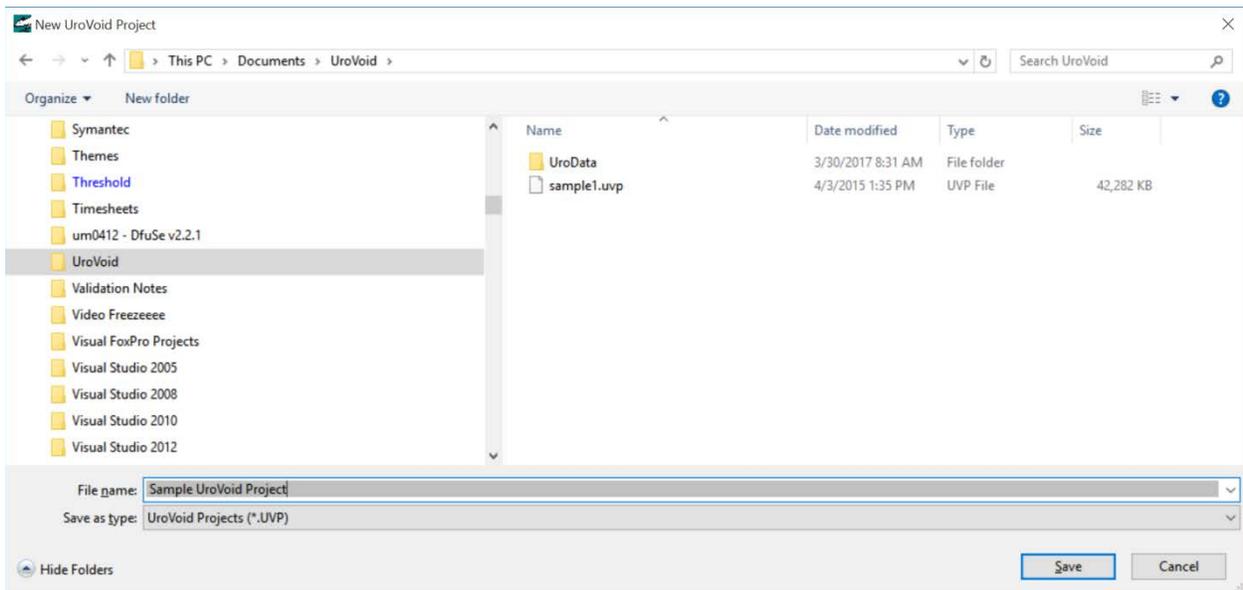
*Figure 3-1 - UroVoid Analysis Start Screen*



### Creating a New Project

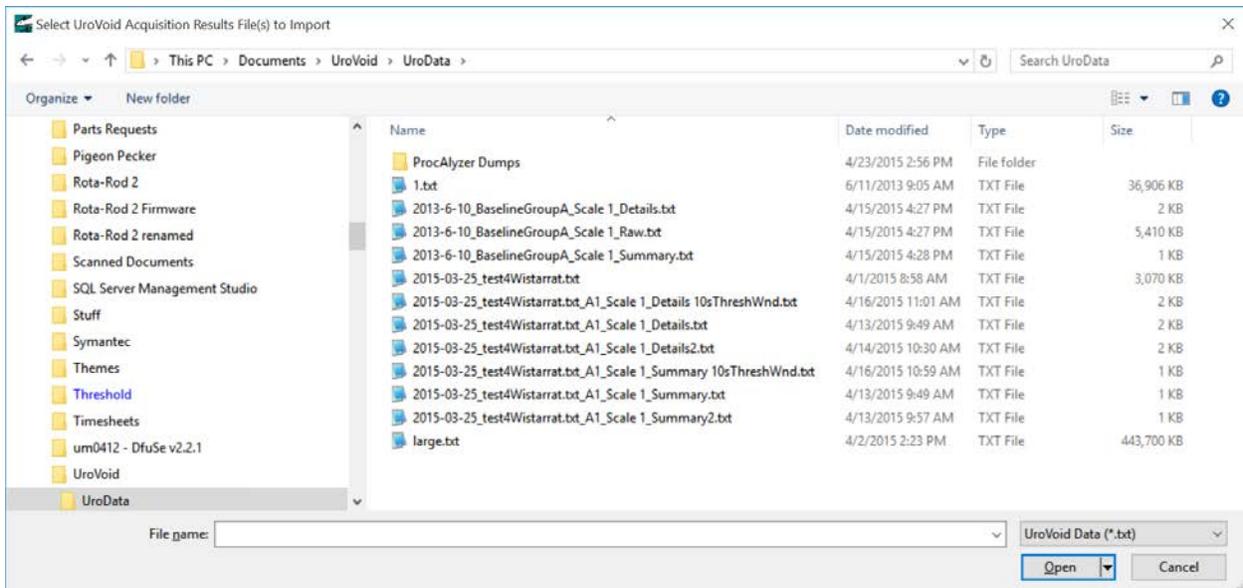
To create a new project click **File > New Project** or click the **Create New Project** button and the **New UroVoid Project** screen will open, Figure 3-2.

Figure 3-2 - New UroVoid Project Save As Screen



Select a folder location and project name and click **Save**. The **Select UroVoid Acquisition Results File(s) to Import** screen will open (Figure 3-3), select the desired raw data file(s) and click **Open**.

Figure 3-3 - Select UroVoid Results Files

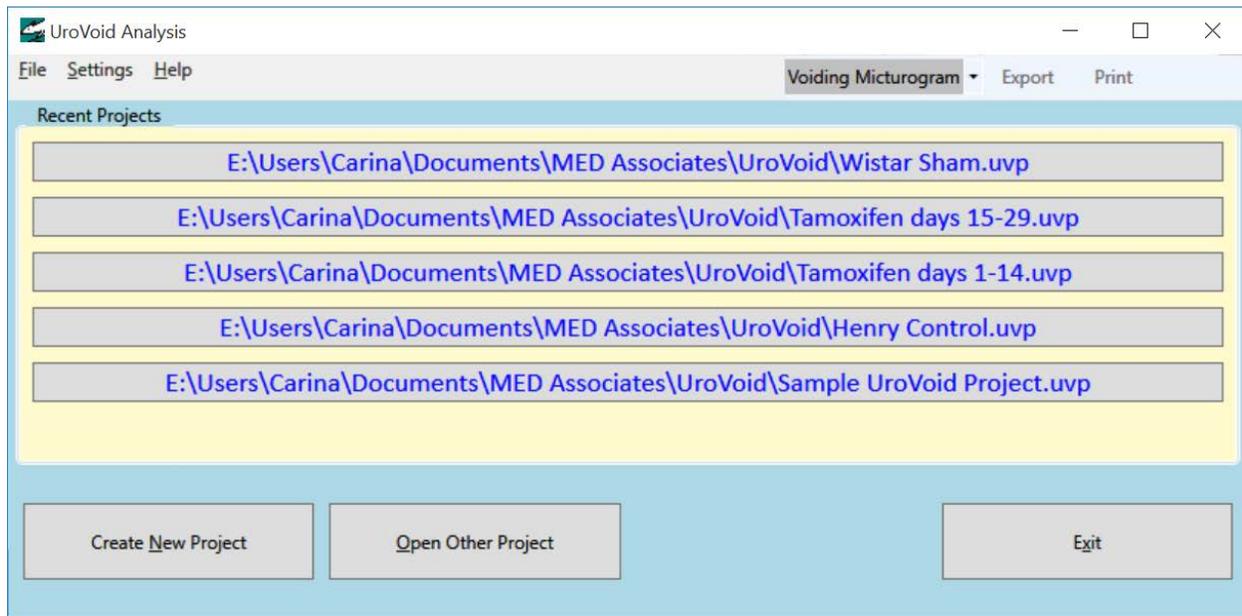


The UroVoid Analysis project screen displays the data in various formats, see Chapter 4, Understanding the Project Screen, for an explanation of the project screen interface.

## Opening an Existing Project

When UroVoid Analysis opens, the recently used projects list is displayed (Figure 3-4). Clicking on a project will open that project. Right-clicking on a project displays the options to open the project or remove the project from the recent project listing.

Figure 3-4 - UroVoid Analysis Recent Projects List



Existing projects may also be opened by clicking **File > Open Project**, selecting the desired project from the file browser and then clicking **Open**. If another project is already open, it will be closed when the newly selected project is opened. Selecting **Cancel** instead of opening a project will close the currently open project, if one is open, and return the user to the recent project listing.

Switching to another project or creating a new project is possible at any time via the **File** menu.

## Viewing Data without a Project

Viewing data without creating a project is possible, though not recommended. The import and analysis settings created during UroVoid Acquisition data import will not be stored without a project file, requiring this data to be calculated again if the data is reexamined at another time.

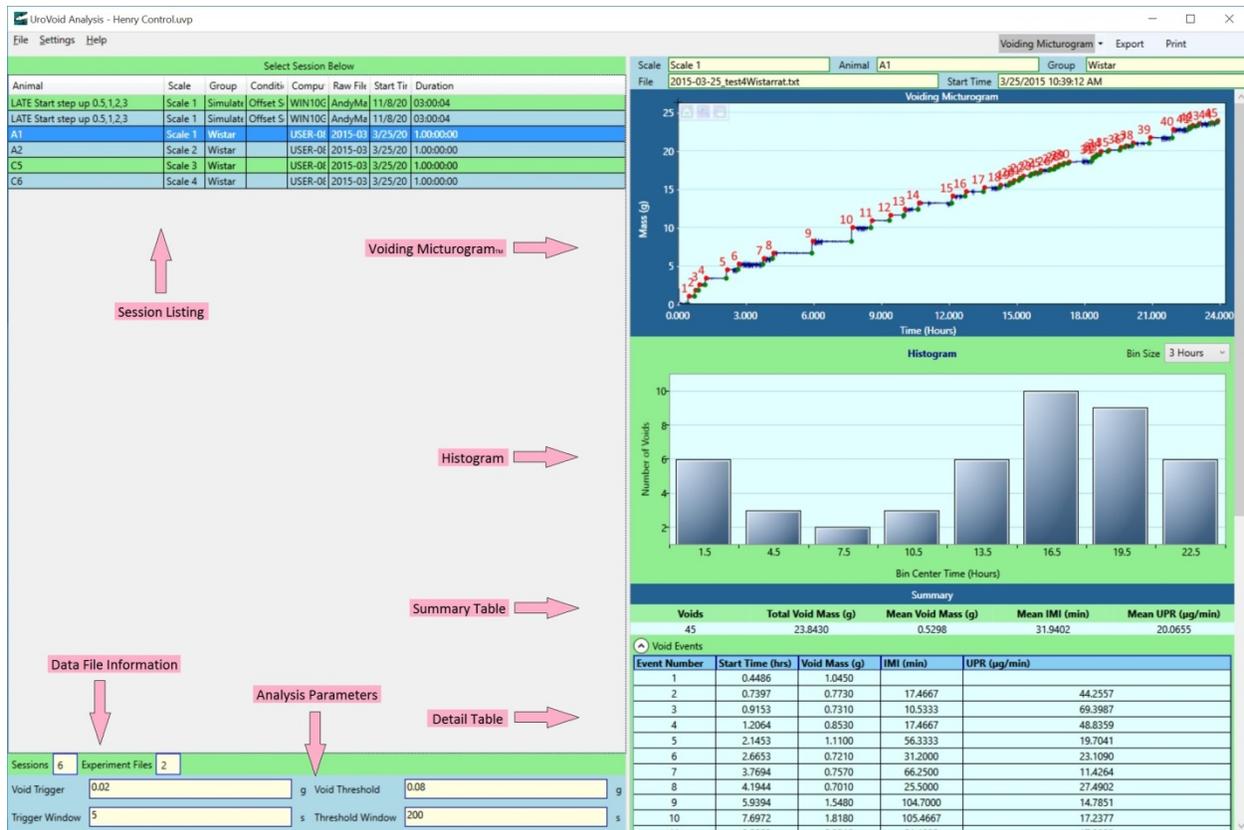
To view UroVoid Acquisition data without creating a project click **File > Import Experiment Data**, select the data file(s) to be reviewed in the **Select UroVoid Acquisition Results File(s) to Import** window and click **Open**. The data is imported and displayed in the project screen for review.

## CHAPTER 4 - THE UROVOID ANALYSIS PROJECT SCREEN

### Overview

The UroVoid Analysis project screen, Figure 4-1, lists the sessions imported into the current project at the upper left. The currently analyzed session is highlighted royal blue, and the session analysis is on the right. The center vertical bar separating the session list from the analyzed session may be grabbed with the mouse and moved horizontally to change the panes' proportions.

Figure 4-1 - UroVoid Analysis Project Screen



### Select a Session

The session list, Figure 4-2, shows the sessions in the data file. Each row in the list represents the readings from a single scale in an acquisition experiment. Each row includes the animal name, the scale used, the group name, the animal's condition, the computer used to record the data, the raw data filename, the experiment start time and the experiment duration. Selecting a session in the list will display that session's data in detail in the Mictrogram, Histogram, Summary Table, and Detail Table on the right side of the screen. The lower left section of the project screen indicates how many sessions and experiment (data) files are in the current project and the analysis parameters applied to the data.

Figure 4-2 – Session Listing

Select Session Below							
Animal	Scale	Group	Condition	Computer	Raw Filename	Start Time	Duration
A1	Scale 1	Wistar		USER-0816649823	2015-03-25_test4Wistarrat.txt	3/25/2015 10:39:12 AM	1.00:00:00
A2	Scale 2	Wistar		USER-0816649823	2015-03-25_test4Wistarrat.txt	3/25/2015 10:39:12 AM	1.00:00:00
C5	Scale 3	Wistar		USER-0816649823	2015-03-25_test4Wistarrat.txt	3/25/2015 10:39:12 AM	1.00:00:00
C6	Scale 4	Wistar		USER-0816649823	2015-03-25_test4Wistarrat.txt	3/25/2015 10:39:12 AM	1.00:00:00

The selected session is highlighted darker blue in the list and its information is confirmed above the Micturogram on the right, Figure 4-3.

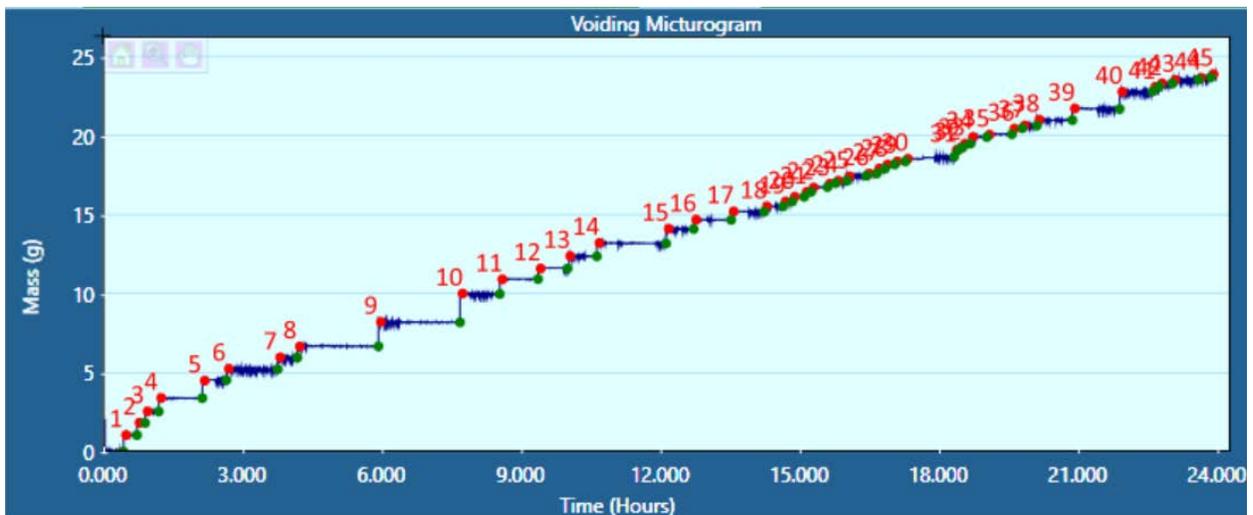
Figure 4-3 – Selected Session Information

Scale	Scale 1	Animal	A1	Group	Wistar
File	2015-03-25_test4Wistarrat.txt		Start Time	3/25/2015 10:39:12 AM	

### Voiding Micturogram™

The Voiding Micturogram™, Figure 4-4, displays the total mass of the voids on the Y-axis, the length of the session (hours), on the X-axis, and the beginning and end of each void event.

Figure 4-4 – Voiding Micturogram™



The beginning of an event is identified by a green marker. The corresponding end of the event is marked with a red marker and red event number (if enabled), see Figure 4-5.

Figure 4-5 - Event Start, End and IMI

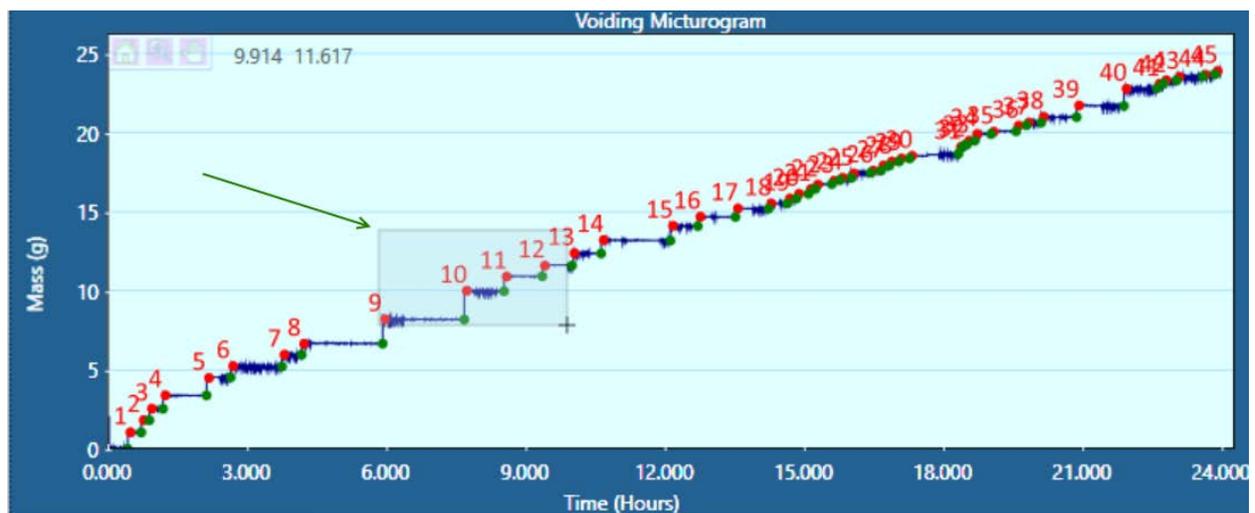


In the top left corner of the Micturogram are the **Home**, **Zoom** and **Pan** buttons, see Figure 4-6. The **Home** button resets the Micturogram to its default status. To zoom in on an event or events, click the **Zoom** button and drag around the desired event(s) as illustrated by the green arrow in Figure 4-7. To pan the Micturogram left or right and up or down, click the **Pan** button, and then click and drag from anywhere in the display to pan to the desired location. The Micturogram will stay in the selected mode, **Zoom** or **Pan**, until another mode is selected or **Home** button is clicked.

Figure 4-6 - Home, Zoom and Pan Buttons



Figure 4-7 - Click and Drag to Zoom In



Clicking in the Micturogram will display the time and mass of the voids **at that point along the data trace line**, the Y component is NOT the Y component of the crosshair point. The crosshairs point in Figure 4-8 is at 6.554 hours on the X-axis and the Y-axis value closest to 6.554 hours is 8.193 grams as shown by the values displayed near the **Home, Zoom, and Pan** buttons.

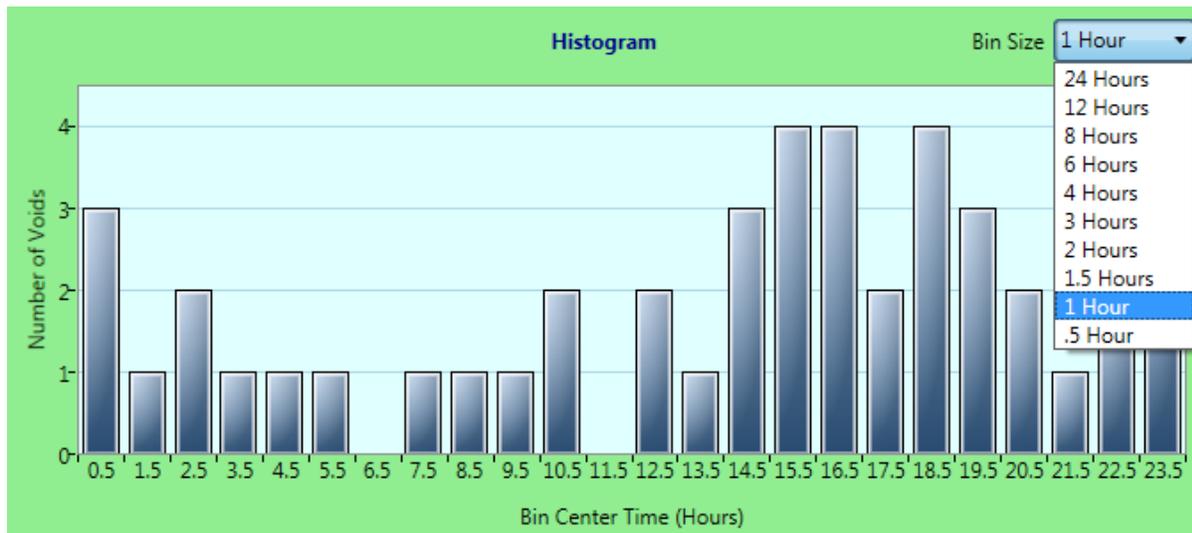
Figure 4-8 - Time and Mass Crosshairs



### Histogram

The Histogram displays the number of voids dispersed over user selectable time bins. The bin size is selected using the dropdown box in the top right corner of Histogram, see Figure 4-9. The X-axis label is the time at the center of the bin. Hold the mouse pointer over a column to see the number of voids in that time bin.

Figure 4-9 - Void Histogram



### Summary Table

The Summary Table in the top of Figure 4-10 lists the summary values for the void events presented in the Detail Table in the lower portion of Figure 4-10.

Figure 4-10 - Summary and Detail Tables

		Summary				
		Voids	Total Void Mass (g)	Mean Void Mass (g)	Mean IMI (min)	Mean UPR (µg/min)
<b>Summary Table</b>		45	23.8410	0.5298	31.9394	20.0493
		^ Void Events				
<b>Detail Table</b>		Event Number	Start Time (hrs)	Void Mass (g)	IMI (min)	UPR (µg/min)
		1	0.4497	1.0480		
		2	0.7397	0.7730	17.4000	44.4253
		3	0.9164	0.7300	10.6000	68.8679
		4	1.2075	0.8540	17.4667	48.8931
		5	2.1453	1.1100	56.2667	19.7275
		6	2.6653	0.7210	31.2000	23.1090
		7	3.7694	0.7570	66.2500	11.4264
		8	4.1953	0.6960	25.5500	27.2407
		9	5.9394	1.5480	104.6500	14.7922
		10	7.6983	1.8190	105.5333	17.2363

The summary line displays the total number of voids, the total mass of all voids (grams), the mean void mass (grams), the mean intermicturition interval (IMI) (minutes), and the mean urine production rate (UPR) (micro-grams per minute). The Detail Table events list may be expanded or collapsed by clicking the up/down arrow near the top, left corner of the table.

A particular event’s IMI and UPR are calculated as follows:

$$IMI_n = \text{Start Time}_n - \text{Start Time}_{n-1}$$

$$UPR_n = \text{Void Mass}_n / IMI_n$$

Event #1 has no IMI or UPR because the last micturition before the experiment started is unknown.

Note, the Micturogram and Histogram may be exported as .JPG files while the Summary Table, Detail Table and raw data may be exported as .TXT files for import into Excel or similar programs. See the File Menu options discussed below.

## CHAPTER 5 - MENU OPTIONS

### File Menu

Item	Description
<u>N</u> ew Project (Ctrl+N)	Creates a new UroVoid project file. See, Creating a New Project.
<u>O</u> pen Project (Ctrl+O)	Opens an existing UroVoid project file. See, Opening an Existing Project.
<u>C</u> lose Project (Ctrl+C)	Closes the currently open UroVoid project.
<u>I</u> mport Experiment Data (Ctrl+I)	Imports raw UroVoid Acquisition data into the currently open project, or into a new untitled empty project. See, Viewing Data Without a Project.
<u>E</u> xport	Enables the export of the Micturogram (.JPG), Histogram (.JPG), Summary table (.TXT), Details table (.TXT) or raw data (.TXT) for the currently selected session. The .TXT files are tab-delimited for import into Excel.
<u>P</u> rint	Prints the Micturogram, Histogram, Summary Table, or Details Table, or Raw Data for the currently selected session.
Re <u>C</u> ent Projects	Provides a shortcut to recently opened projects.
<u>E</u> xit (Alt+F4)	Exits UroVoid Analysis.

### Settings Menu

Item	Description
Analysis Parameters	See Figure 5-1.
Void Trigger	The scale change amount indicating the possible start of a void event.
Void Threshold	The minimum scale change that must occur within the Trigger Window time frame to qualify as a void event.
Trigger Window	The minimum time in which the Void Threshold must be met to qualify as a void event.
Threshold Window	The maximum duration of a void event.
View Event Numbers	Toggles the red event marker numbers on or off in the Micturogram.
Micturogram Data Filter	
Off	Turns the data filter off.
0.01 <u>G</u> rams	Removes artifacts in the data display 0.01g or smaller. See Figure 5-2 and Figure 5-3.
<u>H</u> alf Void Trigger	Removes artifacts in the data display that are one half the size of the Void Trigger or smaller. See Figure 5-2 and Figure 5-3.

Figure 5-1 - Analysis Parameters

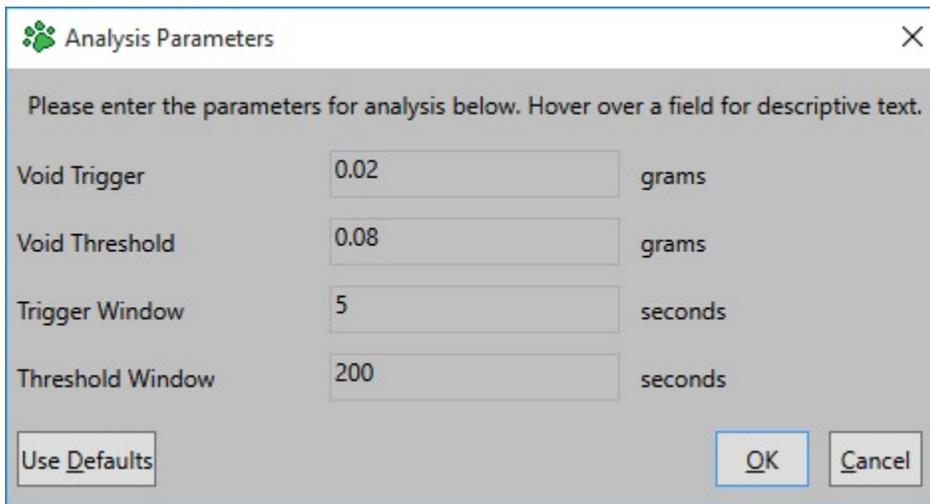


Figure 5-2 - Unfiltered Micturogram



Note the noisy, unfiltered Micturogram signal in Figure 5-2 versus the smoother, filtered Micturogram signal in Figure 5-3.

Figure 5-3 - Micturogram with 0.01g Filter Applied



### Help Menu

Item	Description
<u>M</u> anual	Opens the UroVoid Analysis manual.
<u>A</u> bout	Open the UroVoid Analysis version and copyright information screen.

### Export and Print

Provides quick menu bar (Figure 5-4) access to the printing and export functions available in the **File > Export** and **File > Print** menus (Figure 5-5). From the menu bar drop down select to export or print the active Micturogram, Histogram, Summary table, Details table or the Raw data.

Figure 5-4 - Export and Print Menu Bar Items

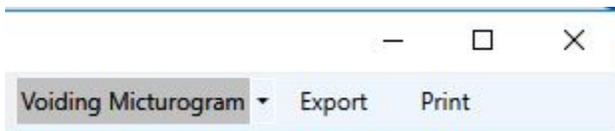
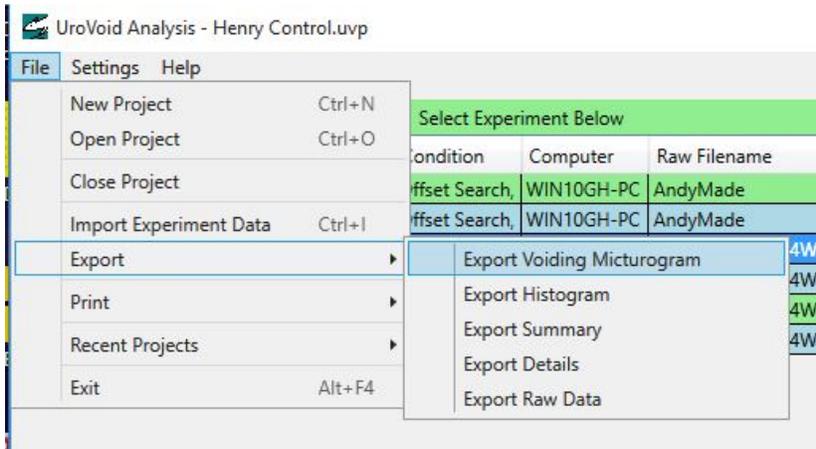


Figure 5-5 - Export and Print From File Menu



## **CHAPTER 6 - CONTACT INFORMATION**

Please contact Med Associates, Inc. for information regarding any of our products.

Visit our website at [www.med-associates.com](http://www.med-associates.com) for contact information.

For technical questions, email [support@med-associates.com](mailto:support@med-associates.com).