USER MANUAL

RaySafe i2 dose manager

RaySafe™

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INTRODUCTION

ABOUT THE RAYSAFE i2 SYSTEM

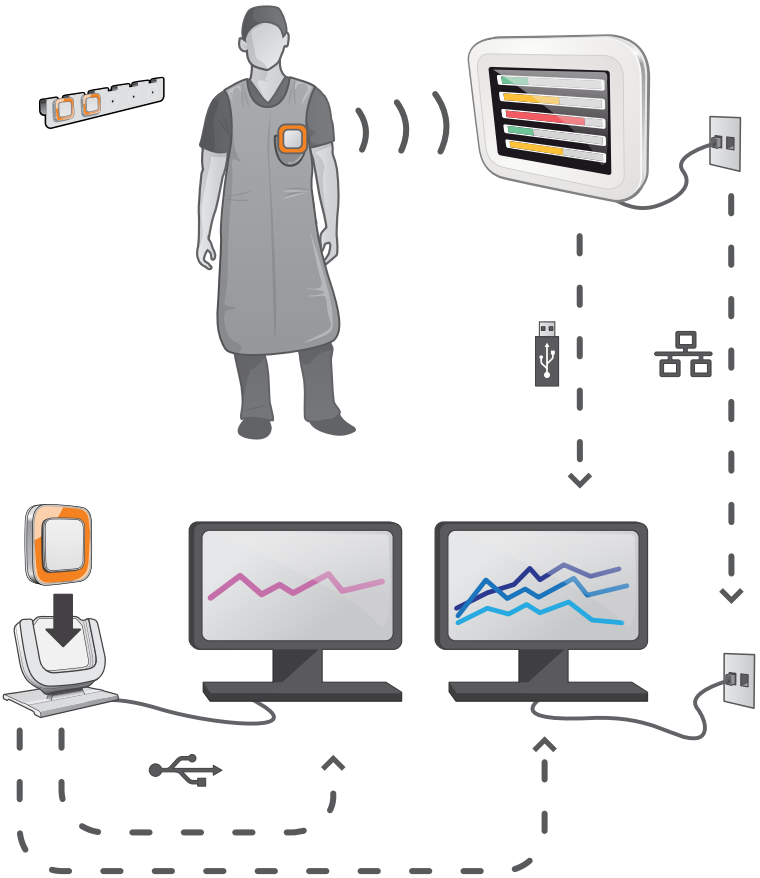

Figure 1. RaySafe i2 System overview

The RaySafe i2 System can contain the following components:

- dosimeter
- real time display
- dose viewer (computer software)
- dose manager (computer software)
- cradle (dock station used to connect dosimeters and computer)
- dosimeter rack (dosimeter storage)

HOW THE SYSTEM WORKS

The dosimeter measures and records X-ray exposure every second and transfers the data wirelessly, via radio, to the real time display.

The real time display shows real time dose exposure from up to eight dosimeters in range at a time. Color indication bars (green, yellow, red) represents the intensity of the currently received exposure. The accumulated dose per individual is displayed next to the color indication bars. By tapping a dosimeter name the user can look at historical data in separate views.

When the dosimeter is not in use, it should be stored in the dosimeter rack, away from the real time display.

More detailed historical dose information can be transferred from dosimeters via the cradle connected to a computer and viewed using the computer software (dose viewer and dose manager).

The dose viewer software is also used for administrating dosimeters, change dosimeter names, colors and reset dose history. The dose manager software is an advanced software for analyzing, reporting and archiving dose information. It handles multiple dosimeters and can retrieve the dose information from multiple real time displays through the hospital network or via USB storage.

ABOUT THIS USER MANUAL

This user manual are intended to assist users in the safe and effective operation of the product described.

Before attempting to operate the product, you must read these instructions for use, noting and strictly observing all WARNINGS and CAUTION notices.

WARNING *A WARNING alerts you to a potential serious outcome, adverse event or safety hazard. Failure to observe a warning may result in death or serious injury to the operator or patient.*

CAUTION *A CAUTION alerts you to where special care is necessary for the safe and effective use of the product. Failure to observe a caution may result in minor or moderate personal injury or damage to the product or other property, and possibly in a remote risk of more serious injury, and/or cause environmental pollution.*

NOTE *Notes highlight unusual points as an aid to an operator.*

These Instructions for Use describe the most extensive configuration of the product, with the maximum number of options and accessories. Not every function described may be available on your product.

GET TO KNOW DOSE MANAGER

This chapter describes the available features in dose manager. Instructions and commonly used work flows are found in section “Use dose manager” on page 33 .

INTRODUCTION TO DOSE MANAGER

Dose manager is a powerful, easy-to-use tool for analyzing, reporting and storing dose information as well as administrating multiple dosimeters.

Dose manager makes it possible for you to:

- Store and manage dose history for multiple dosimeters.
- Collect dose history from real time displays in your local network.
- Analyze dose data.
- View dose history as a graph or table.
- Export dose data for further analysis with other software tools, such as Excel.
- Create and print reports of dose history.

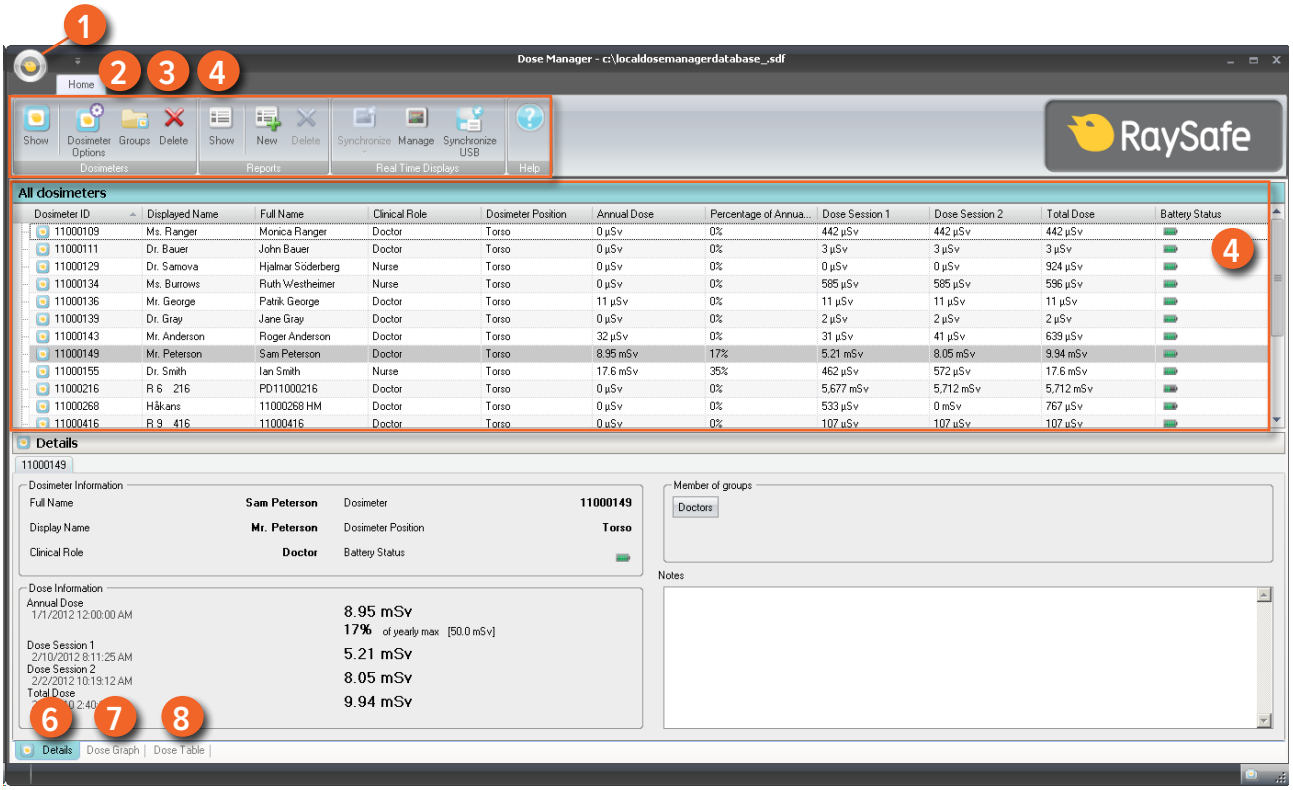

Figure 2. Dose manager overview

The following items are available when you start dose manager:

Table 1. Dose manager overview

ITEM	DESCRIPTION
1 Application menu	Manage databases and printing and access the Options dialogs (see section “Application menu overview” on page 9).
2 Home	Show and manage dosimeters, groups and reports (see section “Home toolbar overview” on page 10).
3 Dose navigation	Navigate in the dose history (see section “Dose navigation toolbar overview” on page 18).
4 Report preview	Preview and export reports (see section “Reports preview toolbar overview” on page 22)

ITEM	DESCRIPTION
5 All dosimeters	Show available items (see section “All dosimeters window overview” on page 24).
6 Details tab	Display information of selected items (see section “Details tab overview” on page 26).
7 Dose graph tab	Show dose data as a graph (see section “Dose graph tab overview” on page 29).
8 Dose table tab	Show dose data as a table (see section”Dose table tab overview” on page 32).

APPLICATION MENU OVERVIEW

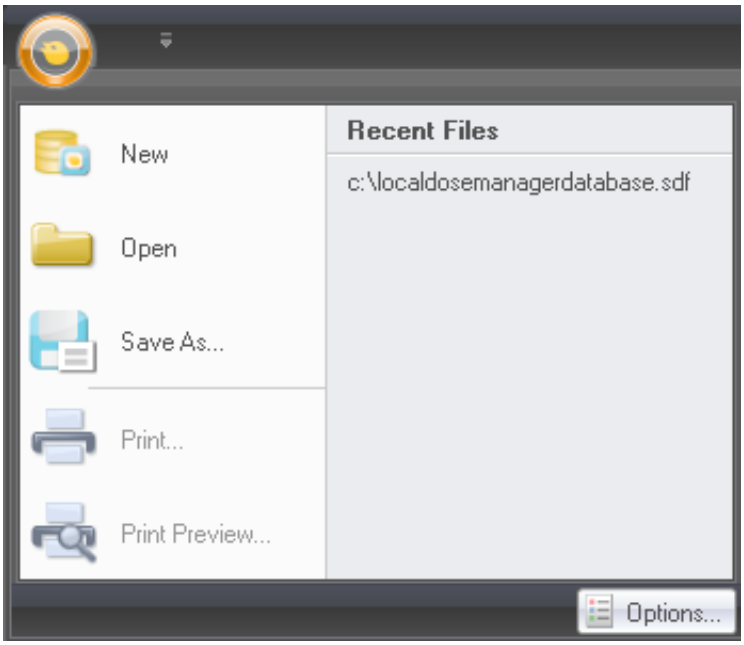

Figure 3. Application menu

The application menu is where you work with dose manager databases and printing. This is also where you find general dose manager settings. The following functions are available in the application menu:

Table 2. Application menu functions

FUNCTION	DESCRIPTION
New	Create a new database.
Open	Open an existing database.
Save as	Save your current database with a new name.
Print	Print dose graphs, dose tables and reports.
Print preview	Preview and customize dose graphs and dose tables. In this menu you can also find tools to export and e-mail the current view.
Options	Set or change an optional dose manager password, change the user interface language.

NOTE *The database can only be saved on a local drive. A network drive is not supported.*

HOME TOOLBAR OVERVIEW

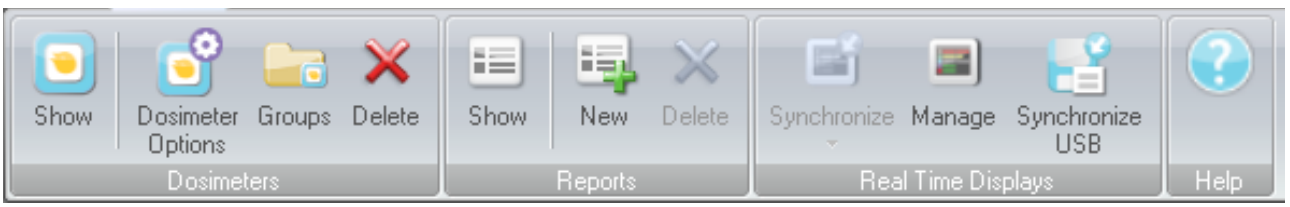

Figure 4. Home toolbar

The home toolbar provides you with tools to manage separate dosimeters, groups of dosimeters and dose data reports. It is also where you find tools to synchronize dose data from dosimeters and real time displays.

DOSIMETERS

In the dosimeters group you can find the following tools:

Table 3. Dosimeter functions

FUNCTION	DESCRIPTION
Show	Show available dosimeters in a list.

FUNCTION	DESCRIPTION
Dosimeter options	Show and manage options for a dosimeter that is placed in a cradle. You can only access and change dosimeter options when the dosimeter is in a cradle. When this information is changed in dose manager, it will be synchronized to real time displays and dose viewer. The dosimeter options dialog is separated in three tabs, see below.
Groups	Show and manage groups of dosimeters. Use groups to arrange dosimeters in different departments, clinical roles or for studies, for example.
Delete	Delete the selected dosimeter(s) or group(s).

DOSIMETER OPTIONS

INFORMATION TAB

The Information tab contains information about the person using the dosimeter.

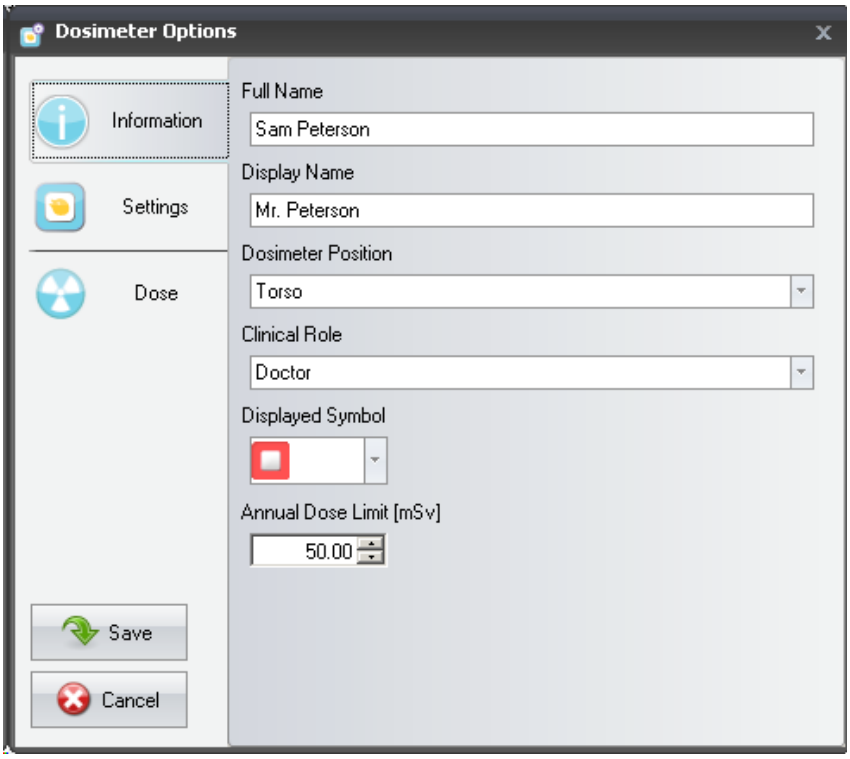

Figure 5. Information tab

Table 4. Information tab functions

FUNCTION	DESCRIPTION
Full name	Full name of the person using the dosimeter. This text field is limited to maximum 40 characters due to space limitations in the real time display. If dosimeters are shared with others, it may be convenient to name the dosimeters “Doctor1”, “Doctor2”, and so on, for the clinical role “Doctor”. Using different colors on the dosimeter can also help to separate each clinical role.

FUNCTION	DESCRIPTION
Displayed name	The name that is displayed when the dosimeter appears in a real time display. This name is also used to identify a dosimeter in dose viewer and dose manager. This text field is limited to maximum 16 characters due to space limitations in the real time display.
Dosimeter position	Reflects where on the person the dosimeter is positioned and can be set to one of Head, Torso, Hand, Belly, Leg or Other.
Clinical role	Reflects the role of the person using the dosimeter and can be set to one of Doctor, Nurse, Technician or Other.
Displayed symbol	The color which is displayed when the dosimeter appears in a real time display.
Annual dose limit	This value is used to show the annual dose value in relation to the annual dose limit in percent. If you do not want to show this relation, set this value to 0.

NOTE *The annual dose limit for the dosimeter is dependent of the shielding factor of the lead apron, as well as other radiation protection used. The more protection the higher the limit can be for the same effective dose to the user. The annual dose limit may or may not be chosen to reflect the legal dose limit where it is used. It could reflect the legal limit or for example a lower target for the clinical user case. These and other considerations need to be counted for when choosing the annual dose limit.*

SETTINGS TAB

The settings tab contains the dosimeter's settings.

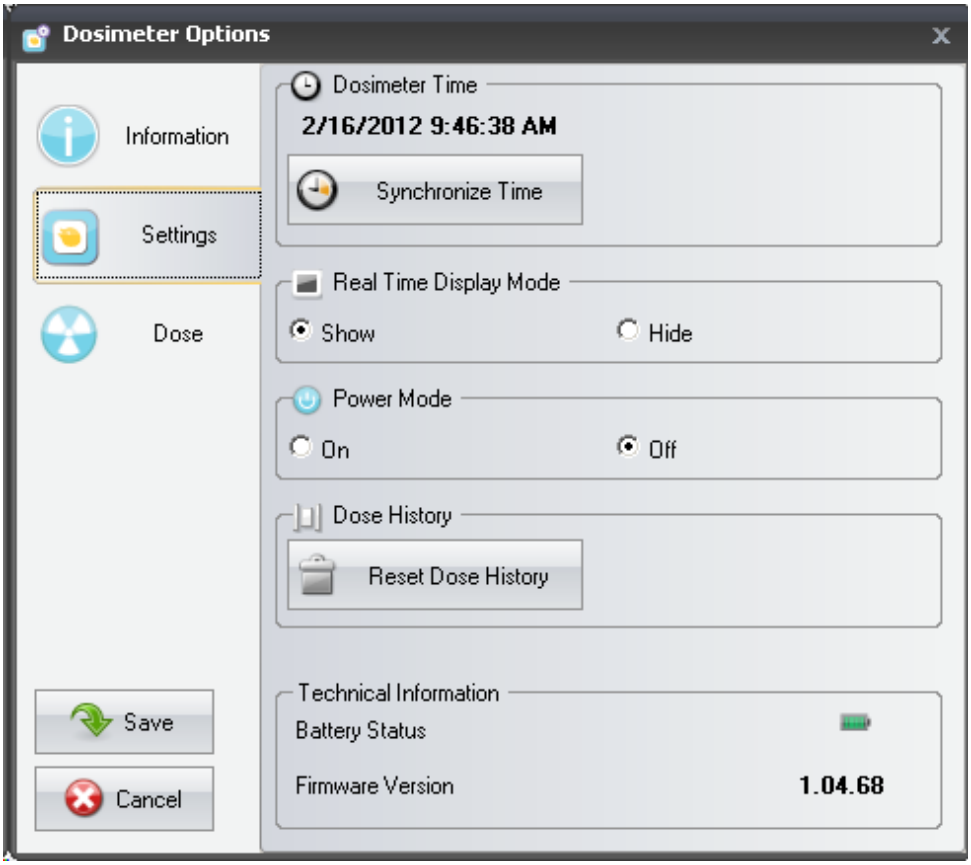

Figure 6. Settings tab

Table 5. Settings tab functions

FUNCTION	DESCRIPTION
Dosimeter time	See the dosimeter's time and synchronize the dosimeter's time with your computer.
Real time display mode	Enable or disable the dosimeter from appearing on real time display screens.

FUNCTION	DESCRIPTION
Power mode	• On – Communication with real time displays will take place and registration of dose data will occur • Off – Power saving mode. No communication with real time displays will take place and no registration of dose data will occur.
Dose history	The accumulated dose history, the dose rate history and Dose Sessions 1 and 2 will be reset to 0. The following happens when the dose history is reset: • In dose viewer and real time displays it will appear as if the dosimeter has started measuring from 0 again. The deleted dose history cannot be retrieved. • In dose manager, the dose history that was available before reset will be archived and possible to retrieve by clicking + next to the dosimeter in the All dosimeters window. Dose manager will start a new session for the dosimeter and it will appear as if the dose history will start measuring from 0 in the new session.
Technical information	Battery status indicates the dosimeter's battery status: • Green and yellow indicates normal use. • Red indicates that the dosimeter need to be replaced in 4-6 months at normal use. • A crossed battery indicates that there is no battery left. The dosimeter does not measure radiation and will not communicate with real time displays. Firmware version refers to the firmware that is currently installed in the dosimeter.

DOSE TAB

The Dose tab shows and manages dose information.

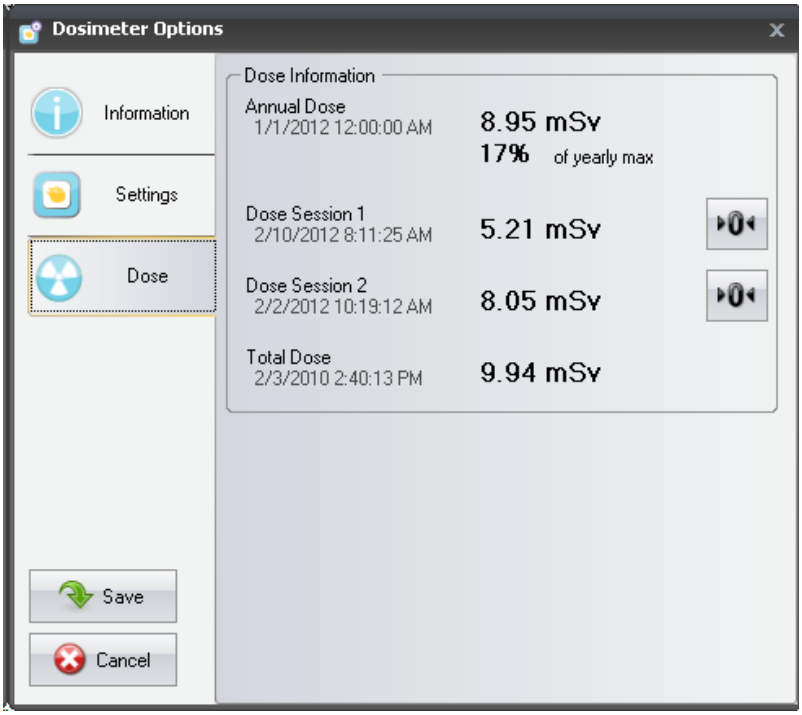

Figure 7. Dose tab

Table 6. Dose tab functions

FUNCTION	DESCRIPTION
Accumulated personal dose	The dosimeter's accumulated annual dose measured this calendar year or since last reset, measured in Sv. Time of last reset.
Percentage of yearly max	The dosimeter's accumulated annual dose measured this year or since last manual reset, measured in Sv.
Dose Session 1	Trip meter for dose values. The accumulated dose for a session since last Dose Session reset, measured in Sv. Use the Reset button to reset this Dose Session to zero. Time of last reset.

FUNCTION	DESCRIPTION
Dose Session 2	Trip meter for dose values. The accumulated dose for a session since last Dose Session reset, measured in Sv. Use the Reset button to reset this Dose Session to zero. Time of last reset.
Total personal dose	The total dose exposure for a dosimeter since last dose history reset. Time of last reset.

REPORTS

In the reports group you can find the following tools:

Table 7. Reports group functions

FUNCTION	DESCRIPTION
Show	Show all available reports.
New	Enter the report wizard to create a new report. There are 4 standard report templates available to base reports upon: • Yearly dose report • Monthly dose report • Weekly dose report • Dosimeter report
Delete	Delete the selected report(s).

For information about how to work with reports, see section “Reports” on page 50. For information about the reports preview, see section “Reports preview toolbar overview” on page 22.

REAL TIME DISPLAYS

The real time displays group provides the following tools:

Table 8. Real time displays group functions

FUNCTION	DESCRIPTION
Synchronize	Synchronize data from real time displays that are added to dose manager.
Manage	Find real time displays in your local network and add them to dose manager. Manage real time displays that are added to dose manager.
Synchronize USB	Synchronize real time display data from USB.

DOSE NAVIGATION TOOLBAR OVERVIEW

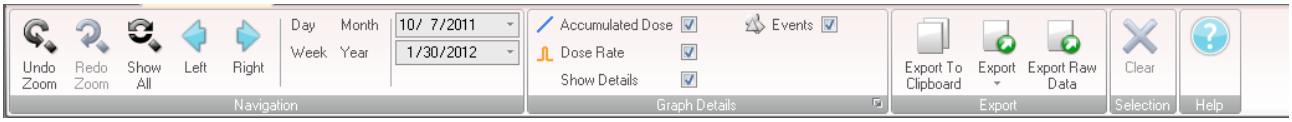

Figure 8. Dose navigation toolbar

The dose navigation toolbar, accessible when viewing dose graphs or dose tables, is where you find tools to navigate in graphs and tables. The following items are available in the dose navigation toolbar:

NAVIGATION GROUP

The Navigation group contains access tools for dose history navigation.

Table 9. Navigation group functions

FUNCTION	DESCRIPTION
Undo zoom	Move one step back in a sequence of zoom actions, showing the last selected time range.
Redo zoom	Move one step forward in a sequence of zoom actions, showing the time range that was selected before the last undo zoom action.

FUNCTION	DESCRIPTION
Show all	Show all available data for the selected dosimeter(s). The time range will start the first date any dosimeter begun to measure dose and stop the last date any dosimeter was synchronized.
Left	Shift the time range one step backward. If you have selected year/month/week/day, the time range will move one year/month/week/day backward. If you have selected another time range, the time range will move approximately 10% backward.
Right	Shift the time range one step forward. If you have selected year/month/week/day, the time range will move one year/month/week/day forward. If you have selected another time range, the time range will move approximately 10% forward.
Day	View dose history for the current day.
Week	View dose history for the current week.
Month	View dose history for the current month.
Year	View dose history for the current year.
Start time	The viewed time range start day.
End time	The viewed time range end day.

GRAPH DETAILS GROUP

The Graph Details group allows you to select which information is visible in the graph.

Table 10. Graph details group functions

FUNCTION	DESCRIPTION
Accumulated dose	Show/hide the accumulated dose in the graph.
Dose rate	Show/hide the dose rate in the dose graph.

FUNCTION	DESCRIPTION
Show details	Checked: The graphs will display dose rate samples for every second, where such data is available. Unchecked: the graphs will display mean dose rate values per hour.
Events	Show/hide events, such as synchronization occasions, in the dose graph.
Graph options	Enter the graph options dialog (small icon in the lower right corner of the graph detail group), where you can access the graph visibility settings and select to show/hide: • Real time display to dosimeter synchronization occasions. • Cradle to dose manager synchronization occasions. • Session reset occasions. • Event labels. • Accumulated dose. • Dose rate. • Details.

EXPORT GROUP

The Export group allows you to export the dose table.

Table 11. Export group functions

FUNCTION	DESCRIPTION
Export to clipboard	Copy all data from the dose table to clipboard.

FUNCTION	DESCRIPTION
Export	Export all visible data from the dose table to one of the following formats: • Microsoft Excel • CSV (Comma-Separated Values, which is a common standard for text spread sheet files that can be used in most spread sheet and database applications such as Excel, Access and Open office.) To make all data visible in the dose table, click Expand All, see section “Export data from a dose table” on page 44.
Export raw data	Export all visible data to a tab separated text file in a simple format that is suited for processing and advanced excel analysis. To make all data visible in the dose table, click Expand All.

SELECTION GROUP

The Selection groups allows you to manage selections in a dose graph.

Table 12. Selection group function

FUNCTION	DESCRIPTION
Clear	Clear the current selection in the dose graph.

REPORTS PREVIEW TOOLBAR OVERVIEW

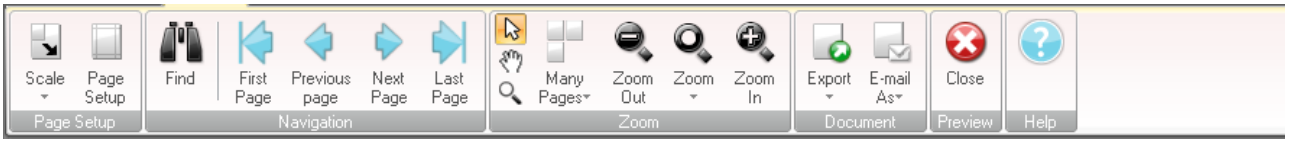

Figure 9. Reports preview toolbar

The reports preview toolbar provides the following tools:

PAGE SETUP GROUP

Access tools to change the layout of the report.

Table 13. Page setup group functions

FUNCTION	DESCRIPTION
Scale	Resize the report to either a percentage of the normal size or to fit a certain page width.
Page setup	Change the page layout of the report.

NAVIGATION GROUP

Access tools to navigate in the report.

Table 14. Navigation group functions

FUNCTION	DESCRIPTION
Find	Search in the report.
First page	Go to the first page.
Previous page	Go to the previous page.
Next page	Go to the next page.
Last page	Go to the last page.

ZOOM GROUP

Access tools to customize the display of the report.

Table 15. Zoom group functions

FUNCTION	DESCRIPTION
Select	Select and drag guides in the report to increase or decrease the margins.
Hand tool	Move the report within the reports window.
Reports	Preview toolbar overview
Magnifier	Increase/decrease the view magnification in the reports window one step.
Many pages	View one or multiple pages.
Zoom out	Decrease the view magnification in the reports window.
Zoom	Increase/decrease the view magnification in the reports window to predefined values.
Zoom in	Decrease the view magnification in the reports window.

DOCUMENT GROUP

Access tools to export or e-mail the report.

Table 16. Document group functions

FUNCTION	DESCRIPTION
Export	Export a report in one of the following file formats: • PDF • HTML • MHT • RTF • CSV • XLS • TXT • Image (BMP, GIF, JPG, PNG, TIFF, EMF, WMF)
E-mail as	E-mail a report in one of the file formats listed above.

PREVIEW GROUP

Manage the report preview.

Table 17. Preview group function

FUNCTION	DESCRIPTION
Close	Close the reports preview and return to the home screen.

ALL DOSIMETERS WINDOW OVERVIEW

The information that appears in this window is context sensitive, which means that it will change depending on what you are currently working on. It is possible to customize which columns to be visible, see section “Customize the columns” on page 39.

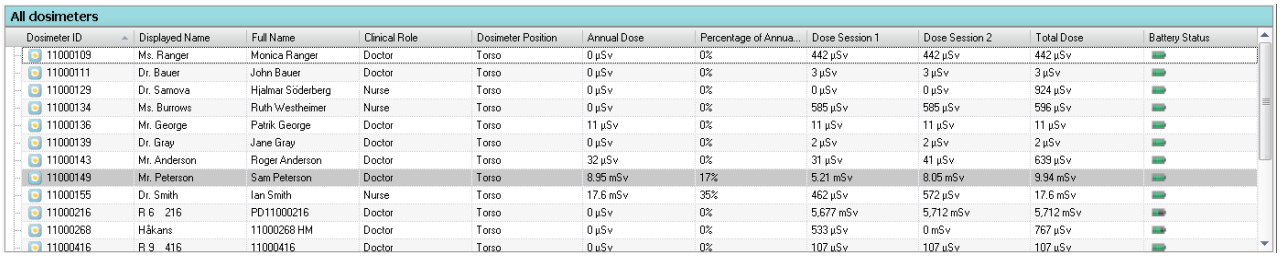

Figure 10. All dosimeters window

When show dosimeters is selected, the following information is visible in the All dosimeters window:

Table 18. All dosimeters window overview

ITEM	DESCRIPTION
Dosimeter ID	A unique dosimeter serial number.
Displayed name	The name that is displayed in the real time display online view.
Full name	Full name of the person using the dosimeter.
Clinical role	One of doctor, nurse, technician or other.
Dosimeter position	One of head, torso, hand, belly, leg or other.
Accumulated personal dose	The dosimeter's total dose measured this calendar year or since last reset, measured in Sv.
Percentage of annual dose	The dosimeter's accumulated annual dose measured this year or since last manual reset in relation to annual dose limit, measured in percent.
Dose Session 1 and 2	Trip meter for dose values. The accumulated dose for a session since last dose Session reset, measured in Sv.
Total personal dose	The total dose exposure for a dosimeter since last dose history reset.

ITEM	DESCRIPTION
Battery status	The dosimeter's battery status: • Green: normal use. • Yellow: normal use. • Red: the dosimeter need to be replaced in 4 – 6 months at normal use. • Crossed battery: there is no battery left. The dosimeter does not measure radiation and will not communicate with real time displays.

DETAILS TAB OVERVIEW

The information that appears in the details tab is context sensitive, which means that it will change depending on what you are currently working on.

DOSIMETER DETAILS

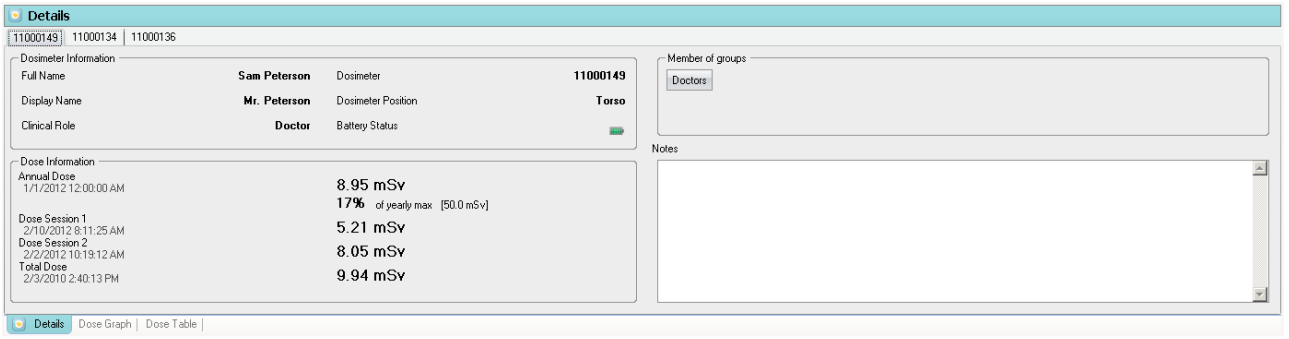

Figure 11. Dosimeter details

When a dosimeter is selected in the All dosimeters window, you can access the following information in the details tab:

Table 19. Dosimeter details items

ITEM	DESCRIPTION
Dosimeter information	For descriptions, see “Table 18. All dosimeters window overview” on page 25.
Dose information	For descriptions, see “Table 18. All dosimeters window overview” on page 25.
Member of groups	Shows the groups the dosimeter belongs to, if any.
Notes	View and write optional notes about the dosimeter.

GROUP DETAILS

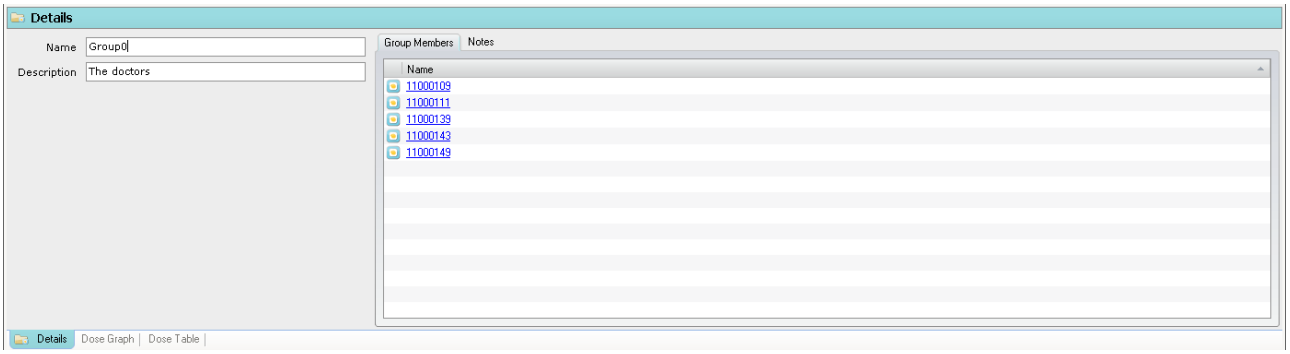

Figure 12. Group details

When a group is selected in the Groups window, you can access the following information in the details tab:

Table 20. Group details items

ITEM	DESCRIPTION
Name	View and change the group’s name
Description	View and change an optional description for the group.
Group members	Shows the group’s members.
Notes	View and write optional notes about the group.

REPORT DETAILS

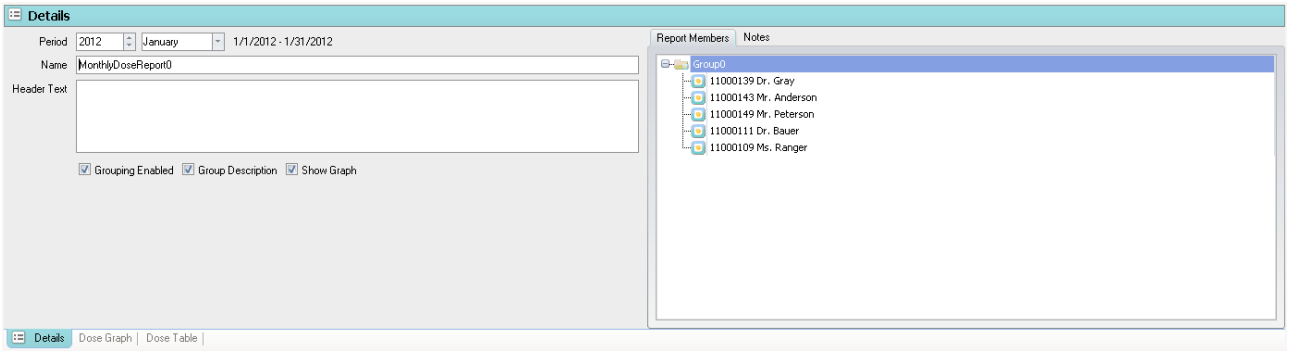

Figure 13. Report details

When a report is selected in the reports window, you can access the following information in the details tab:

Table 21. Report details items

ITEM	DESCRIPTION
Period	The report's time period.
Name	View and change the report's name.
Header text	View and change an introduction to the report.
Grouping enabled	Check this box to enable group name in the report.
Group description	Check this box to enable group description in the report.
Show graph	Check this box to enable an optional pie chart in the report.
Report members	Show the dosimeter(s) and group(s) that are members of the group.
Notes	View and write optional notes about the report.

DOSE GRAPH TAB OVERVIEW

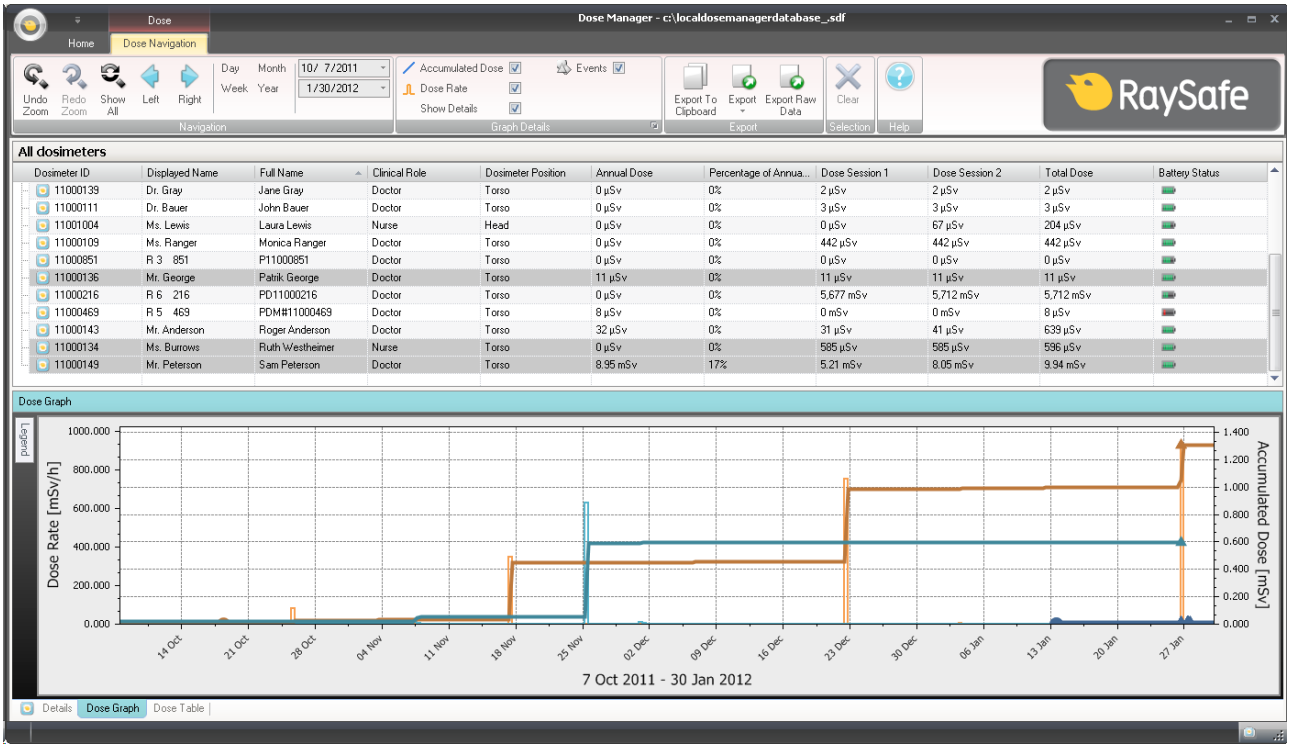

Figure 14. Dose graph overview

In the dose graph tab, data from one or several dosimeters will be presented as a graph. It is possible to navigate in the graph and to customize the view according to your needs, see section “View dose history as a graph” on page 40 and section “View dose history as a graph” on page 46 for instructions.

GRAPH LEGEND

In the graph legend you can see information about the graphs for different dosimeters.

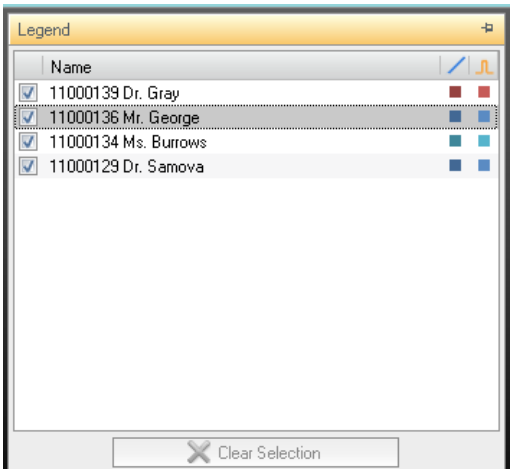

Figure 15. Graph legend

SELECTIONS IN A DOSE GRAPH

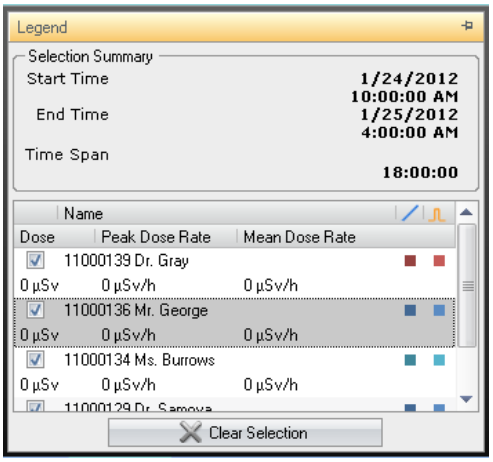

Figure 16. A selection in a dose graph

Make selections in a dose graph to analyze a certain time span further, see section “Make a selection in a graph” on page 41. When you have made a selection, the following information is available in the graph legend:

Table 22. Dose graph selections

ITEM	DESCRIPTION
Selection summary	An overall description about the selection.

ITEM	DESCRIPTION
Start	The selection's start date and time.
End	The selection's end date and time.
Span	The selection's duration in number of days and hours.
Name	Sort the list of dosimeters in a selection either ascending or descending.
Dose	The total dose in the selected time span.
Peak dose rate	The maximum dose rate in the selected time span.
Mean dose rate	The mean dose rate in the selected time span.

EVENTS IN A DOSE GRAPH

The dose graph can show information about the following events:

Table 23. Dose graph events

EVENT	DESCRIPTION
Real time display to dosimeter synchronization	Shows when a dosimeter has been synchronized via a occasions real time display.
Cradle to dosimeter synchronization	Shows when a dosimeter has been synchronized via a occasions cradle.
Session reset occasions	Shows when Dose Session 1 or 2 has been reset.

DOSE TABLE TAB OVERVIEW

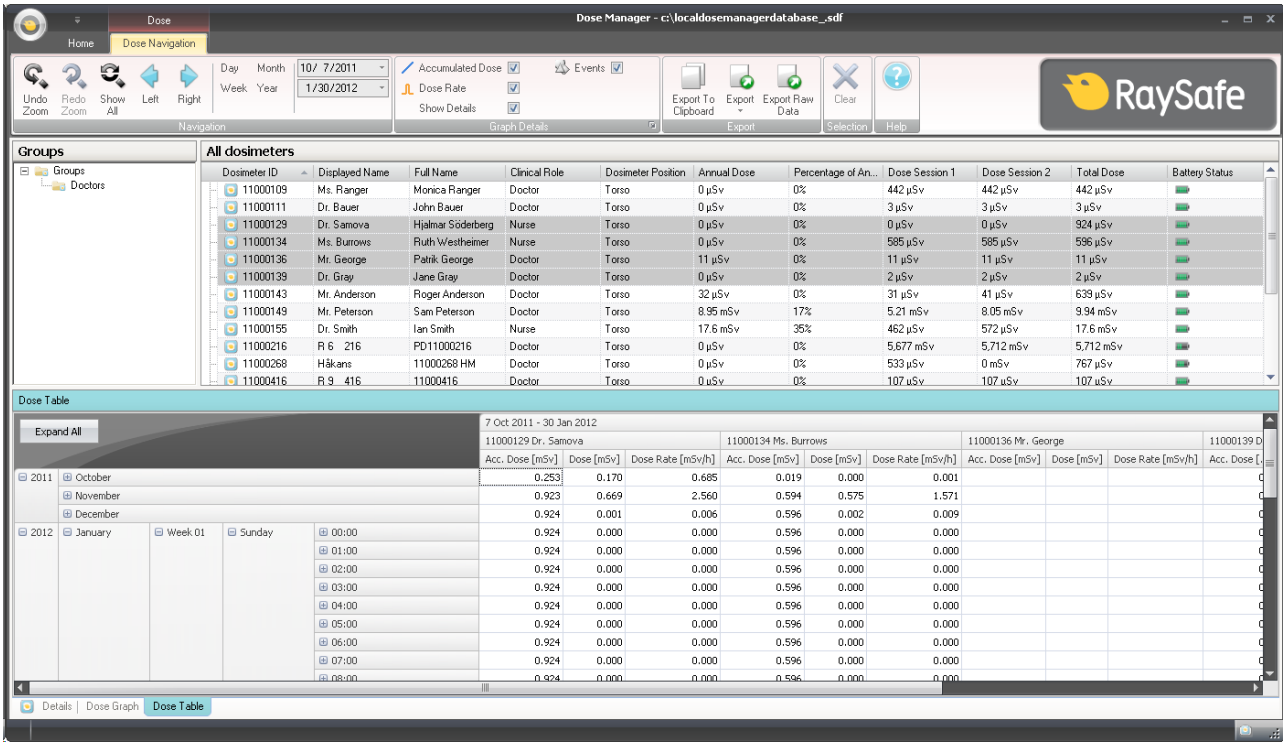

Figure 17. Dose table overview

In the dose table tab, data from one or several dosimeters will be presented as a table. It is possible to navigate in the table and to customize the view according to your needs, see section “View dose history as a table” on page 42 and section “View dose history as a table” on page 48 for instructions.

USE DOSE MANAGER

This chapter contains instructions and commonly used work flows in dose manager. Detailed descriptions of all the available features are found in section “Get to know dose manager” on page 7.

GET STARTED WITH DOSE MANAGER

CHANGE DOSIMETER INFORMATION AND SETTINGS

When you change the dosimeter’s information and settings in dose manager the dosimeter will synchronize these changes to real time displays and dose viewer.

NOTE *It is only possible to access and change the dosimeter options when the dosimeter is placed in a cradle.*

Follow the instructions below to change dosimeter information and settings:

1. Make sure that a cradle is connected to your computer’s USB port.
2. Insert a dosimeter in the cradle.

The computer will detect the dosimeter automatically and the dosimeter information will appear in dose manager.

3. Access the dosimeter options dialog by clicking the dosimeter options button in the dosimeter group in the home tab.

The dosimeter options dialog is separated in three tabs. For descriptions about the information that is available in these tabs, see section “Dosimeters” on page 10.

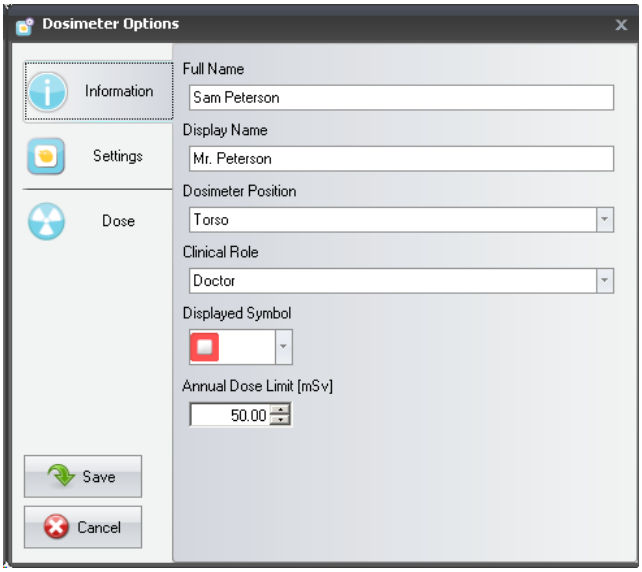

Figure 18. Dosimeter information tab

Information tab – Change information about the person using the dosimeter. Store or discard changes with Save or Cancel.

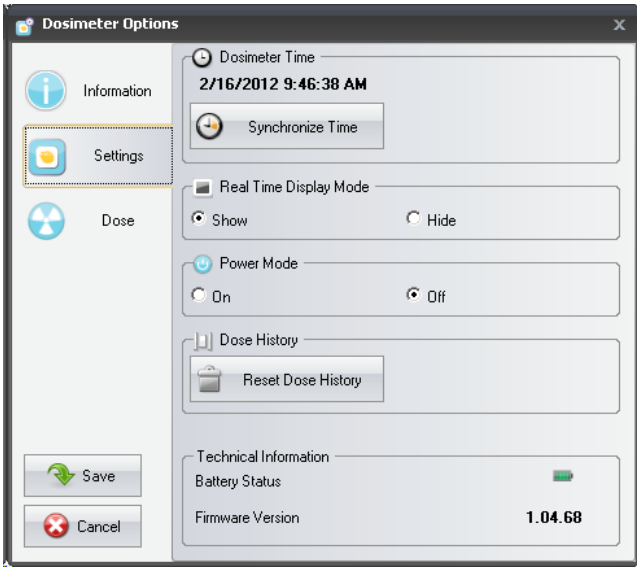

Figure 19. Dosimeter settings tab

Settings tab – Change the dosimeter's settings and access information about the dosimeter. The actions synchronize time and reset dose history are applied immediately. Store or discard all other changes with Save or Cancel.

Figure 20. Dosimeter settings Dose tab

Dose tab – View the current accumulated dose for the dosimeter and reset Dose Session 1 and 2. The action reset Dose Session is applied immediately and also exits the dialog.

4. Wait for a few seconds before you remove the dosimeter from the cradle after you have saved the changes.

COLLECT DATA FROM DOSIMETER

Follow the instructions below to collect data from a dosimeter:

1. Make sure that a cradle is connected to your computer's USB port.
2. Insert a dosimeter in the cradle.

The computer will detect the dosimeter automatically and the dosimeter information will appear in dose manager.

COLLECT DATA FROM REAL TIME DISPLAY

Follow the instructions below to collect data from one or several real time displays in your local network:

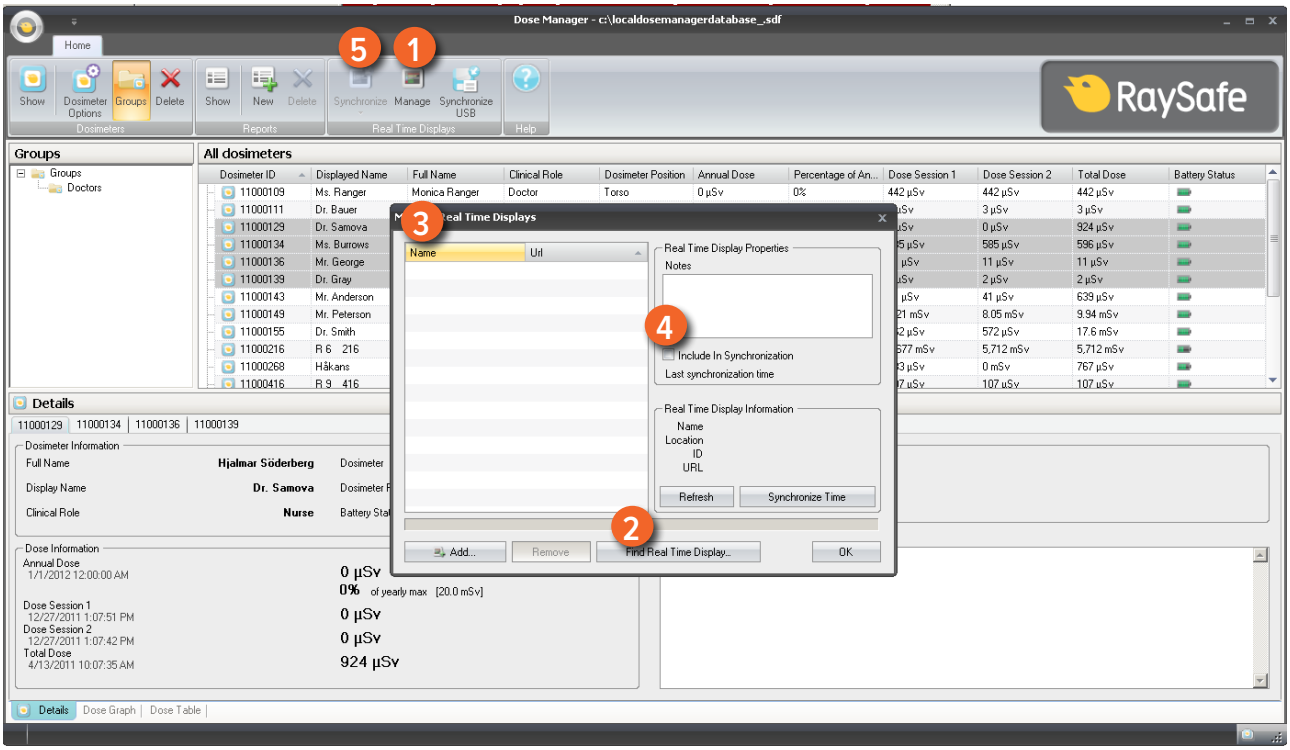

Figure 21. Collect data from real time display

1. Click the button Manage in the Home toolbar.
2. Select Find real time displays and wait while dose manager is searching for real time displays in your network.
3. Select a real time display and click Select.
4. Check the box Include in synchronization and click OK.
5. Click the button Synchronize.

The dosimeter information will appear in dose manager.

Finding real time displays on a local network might not be possible due to the network configuration. If you cannot find a real time display that is installed on your local network it can also be added to the list of real time displays for dose manger using its network IP address. The IP address used by the real time display can be found in its network setup menu.

TROUBLESHOOTING

If communication with a real time displays that has been manually added to the list by using its network address does not work, it might be a result of network configuration. Make sure that the real time display and Dose manager PC is connected to the same network and use the same subnet mask. If the problems cannot be resolved, contact the local network administrator.

COLLECT DATA FROM USB

Follow the instructions below to collect data from USB:

1. Click the button Synchronize USB in the Home toolbar.
2. Select the folder from which to synchronize real time display data.
3. Click OK.

SHOW AND MANAGE GROUPS OF DOSIMETERS

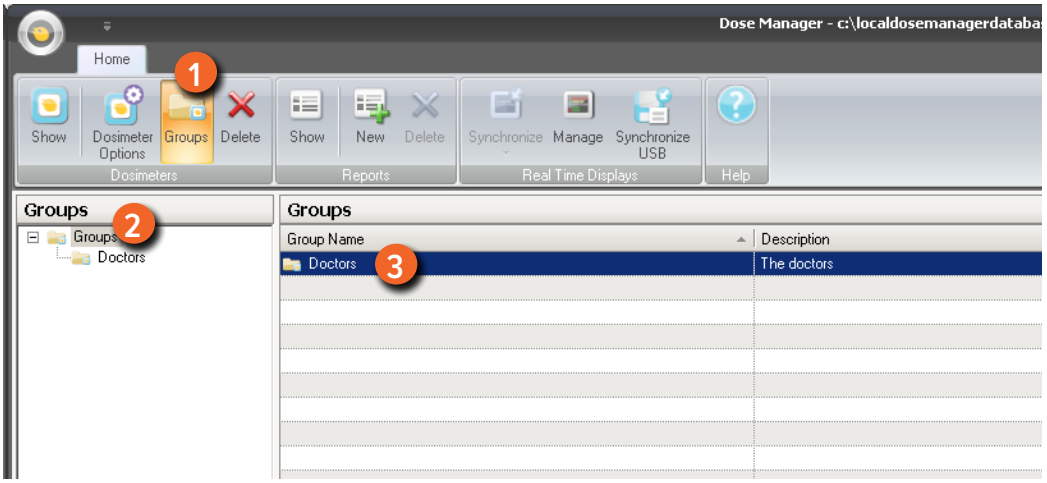

Figure 22. Create a group of dosimeters

Follow the steps below to create a new group:

1. Click the button Groups in the Home toolbar to view the groups' tree.
2. Right-click Groups in the groups' tree to create a new sub group.
3. Go back to the All dosimeters window by clicking on Show in the dosimeters group; then drag dosimeter(s) from the All dosimeters window to group(s) they are going to belong to.
   Right-click on a group to delete or rename the group or access group properties.

WARNING *Deleting a dosimeter from the All dosimeters window will result in removing the dosimeter and all related dose history from the dose manager database.*

WORK WITH DOSE SESSIONS

Use Dose Session 1 and 2 to measure dose for specific time spans, for example a specific procedure or a working day.

The end user can easily reset these Dose Sessions in the real time display without the use of a computer. When Dose Sessions are reset either on a real time display that is synchronized to dose manager, or directly in dose manager, a Dose Session event will be added to the dose history. This event will be visible on the dosimeter's accumulated dose series when viewed.

NOTE *Dose Session resets that are done in dose viewer will not be displayed as an event in dose manager.*

RESET DOSE HISTORY

The accumulated dose history, the dose rate history and Dose Sessions 1 and 2 will be reset to 0. The dose history that was available before reset will be archived and possible to retrieve by clicking + next to the dosimeter in the All dosimeters window. Dose manager will start a new session for the dosimeter and it will appear as if the dose history will start measuring from 0 in the new session.

Follow the steps below to reset the dose history:

1. Make sure that a cradle is connected to your computer's USB port.
2. Insert a dosimeter in the cradle.

The computer will detect the dosimeter automatically and the dosimeter information will appear in dose manager.

3. Access the dosimeter settings dialog by clicking the dosimeter options button.
4. Select the Settings/dose tab.
5. Click Reset dose history. This action is applied immediately and also exits the dialog.

SAVE DATA

Dose manager automatically saves application and dose data to the database that you are currently working on.

Use Save as to save the database you are currently working on with a new name.

NOTE *The database can only be saved on a local drive. A network drive is not supported.*

NOTE *Dose manager does not handle backup and restore. Therefore you have to make sure that you are saving the database in a location that is backed up.*

WORK WITH THE MAIN WINDOW

CUSTOMIZE THE COLUMNS

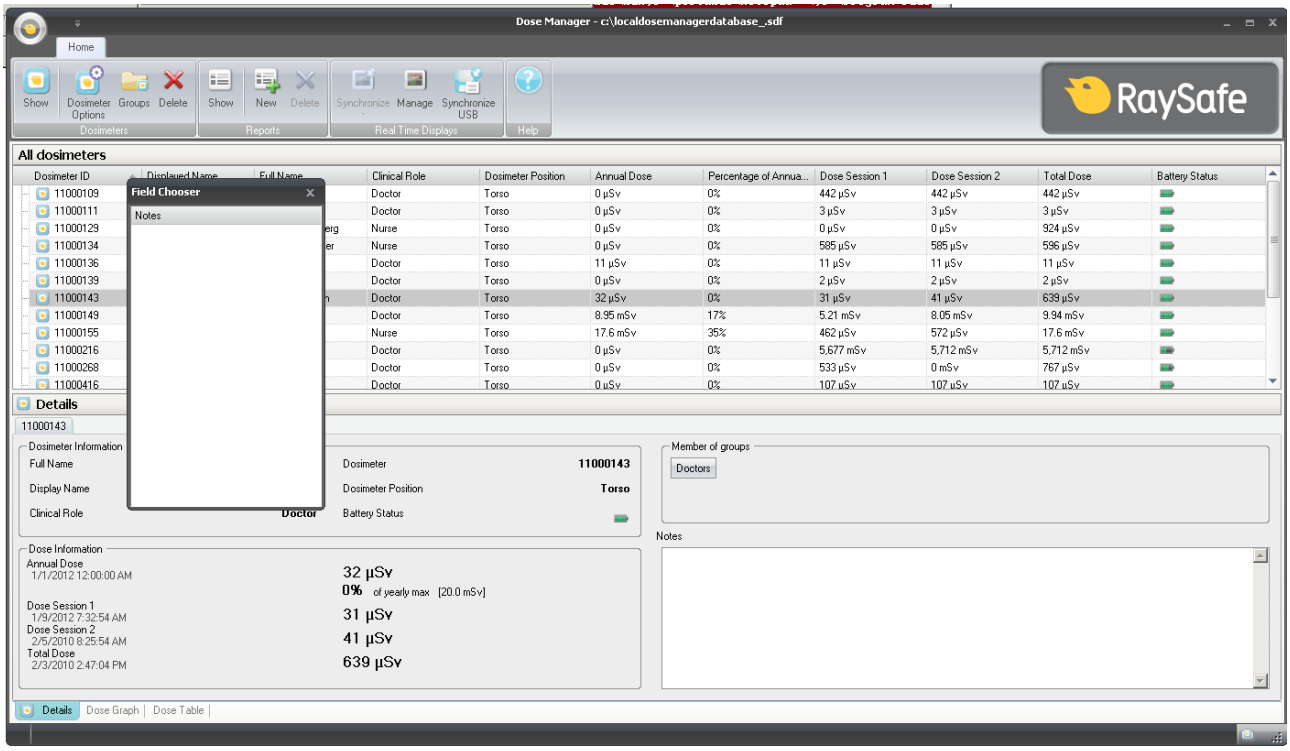

Figure 23. Customize columns

Follow the instructions below to add or remove columns in the main window:

1. Right-click in the column header row in the main window and select Show field chooser.
2. Drag and drop column headers between the field chooser and the column header row in the main window. The order of the selected column headers can be easily changed. Just drag and drop a column header to move it to the left or to the right.

SORT INFORMATION IN THE COLUMNS

- Click on the different column headers to sort the list ascending or descending.

ANALYZE DOSE HISTORY FROM ONE DOSIMETER

VIEW DOSE HISTORY AS A GRAPH

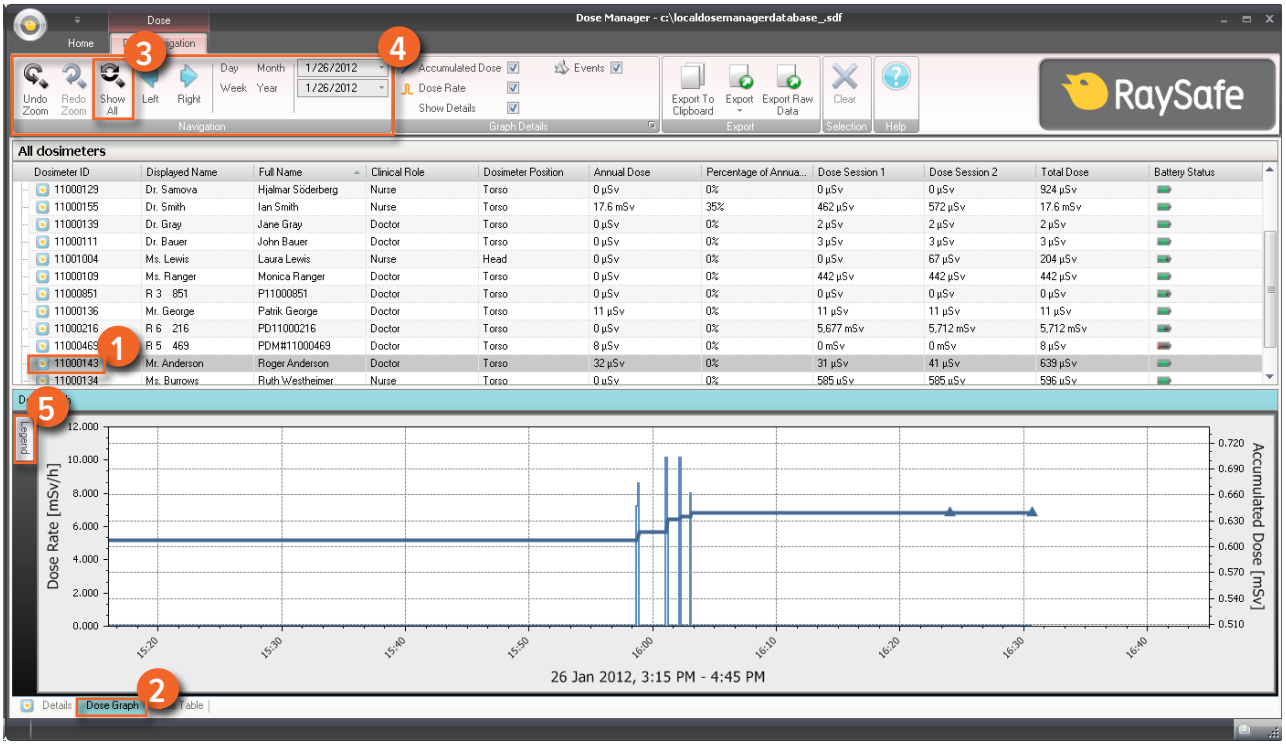

Figure 24. View dose history as a graph

Follow the instructions below to view dose history as a graph:

1. Select the dosimeter you would like to analyze in the All dosimeters window.
2. Click the tab Dose Graph to see the dose data presented as a graph.
3. Click Show all.

All available data for the selected dosimeter will appear. The time range will start the first date the dosimeter begun to measure dose and stop the last date the dosimeter was synchronized.

4. Use the Navigation and Graph details toolbars in the Dose Navigation toolbar to customize the graph and navigate in it.
5. Click the button Legend to the left of the graph to see the graph legend.

To make the graph legend permanently visible, click the pin in the upper right corner. Click the pin again to hide the graph legend.

To change the graph colors, select a dosimeter and right-click on it. Select either dose graph color or dose rate graph color and choose your preferred color and click OK.

NAVIGATE IN A GRAPH

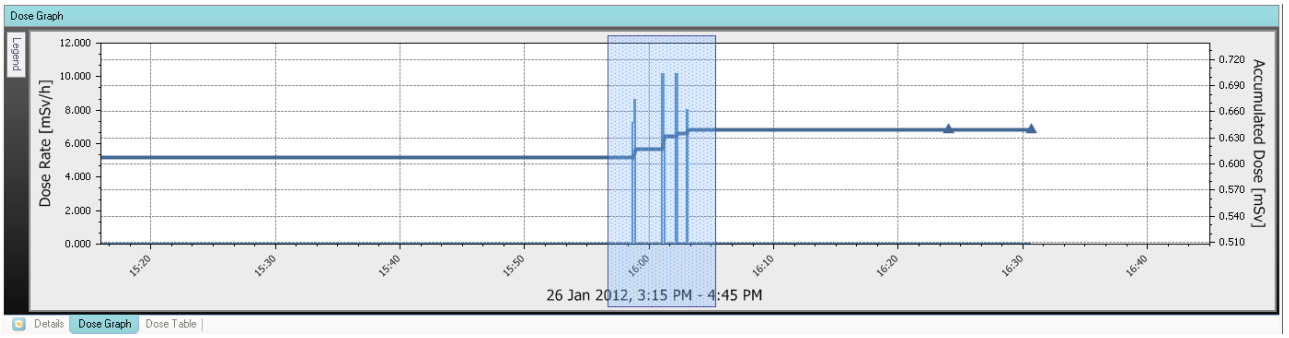

Figure 25. Zoom in a graph

Perform the following actions to navigate in a graph:

1. Use the mouse to left click and drag in the graph to increase the view magnification.
2. Use the tools in the dose navigation toolbar to navigate further in the graph.

MAKE A SELECTION IN A GRAPH

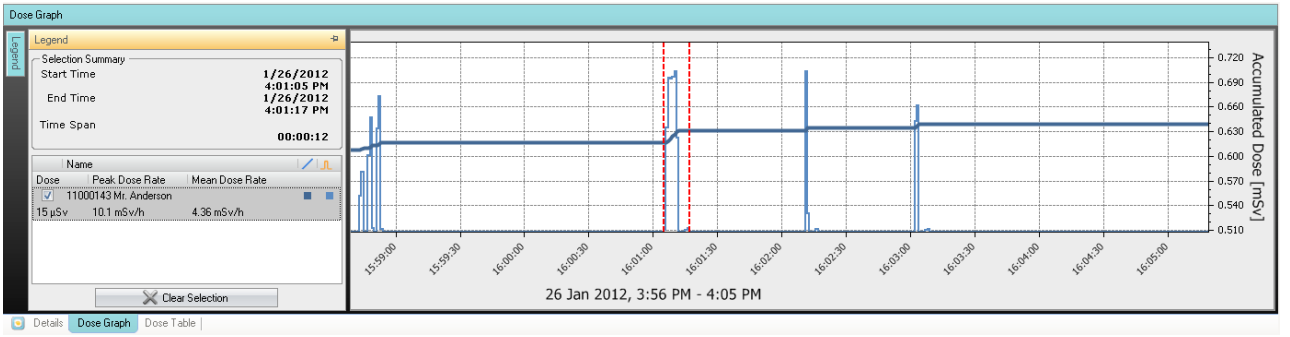

Figure 26. Make a selection in a graph

If you want to analyze a certain part of a graph further, follow the instructions below to make a selection, which will give you more information:

1. Use the mouse to Shift-click and drag to select in the graph.
   This makes a selection in a time span in the graph. The selection is indicated with vertical red dotted lines.
2. View detailed information from the selection in the graph legend.
3. Clear the selection by clicking Clear in the dose navigation toolbar.

VIEW DOSE HISTORY AS A TABLE

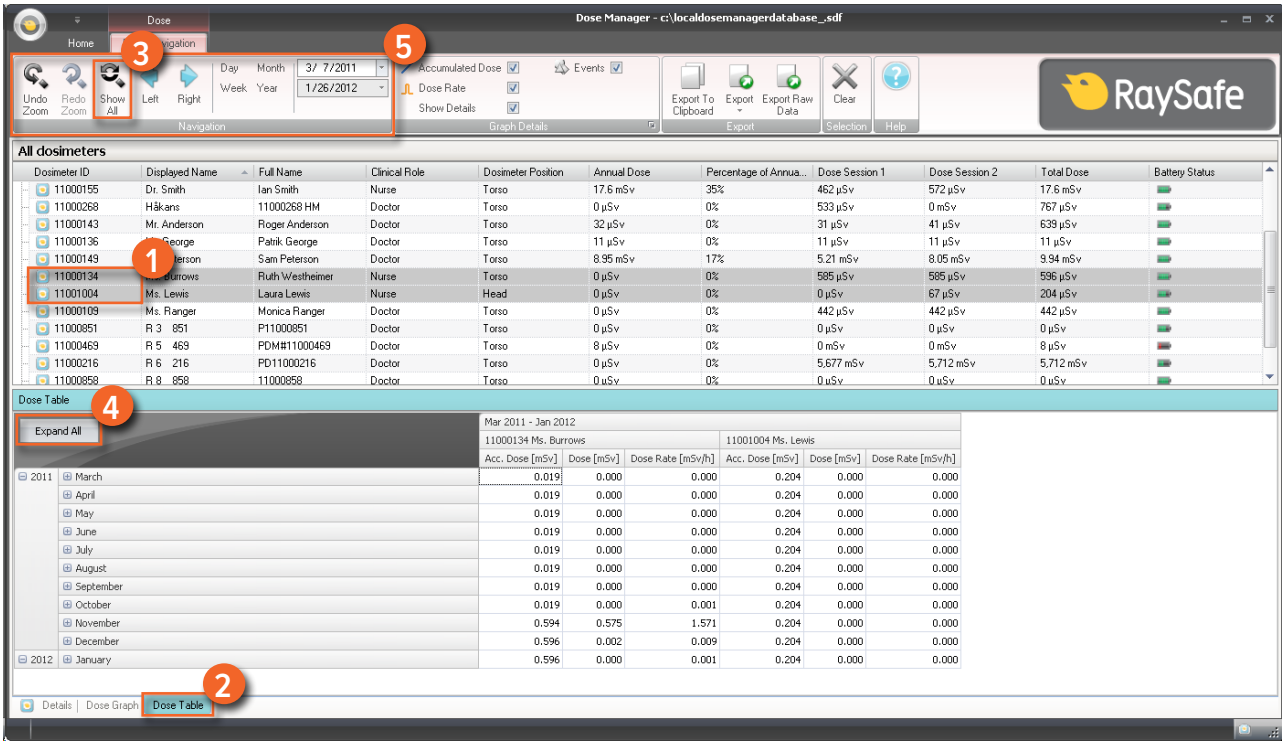

Figure 27. View dose history as a table

Follow the instructions below to view dose history as a table:

1. Select the dosimeter you would like to analyze in the All dosimeters window.
2. Click the tab Dose Table to see the dose data presented in a table.
3. Click Show all.

All available data for the selected dosimeter will appear. The time range will start the first date the dosimeter begun to measure dose and stop the last date the dosimeter was synchronized.

4. Click Expand all to see detailed information.
5. Use the Navigation and Graph details toolbars in the Dose Navigation toolbar to customize the table and navigate in it.

NOTE *The data presented in the table depends on which time span that is used.*

PRINT DATA FROM A DOSE GRAPH OR DOSE TABLE

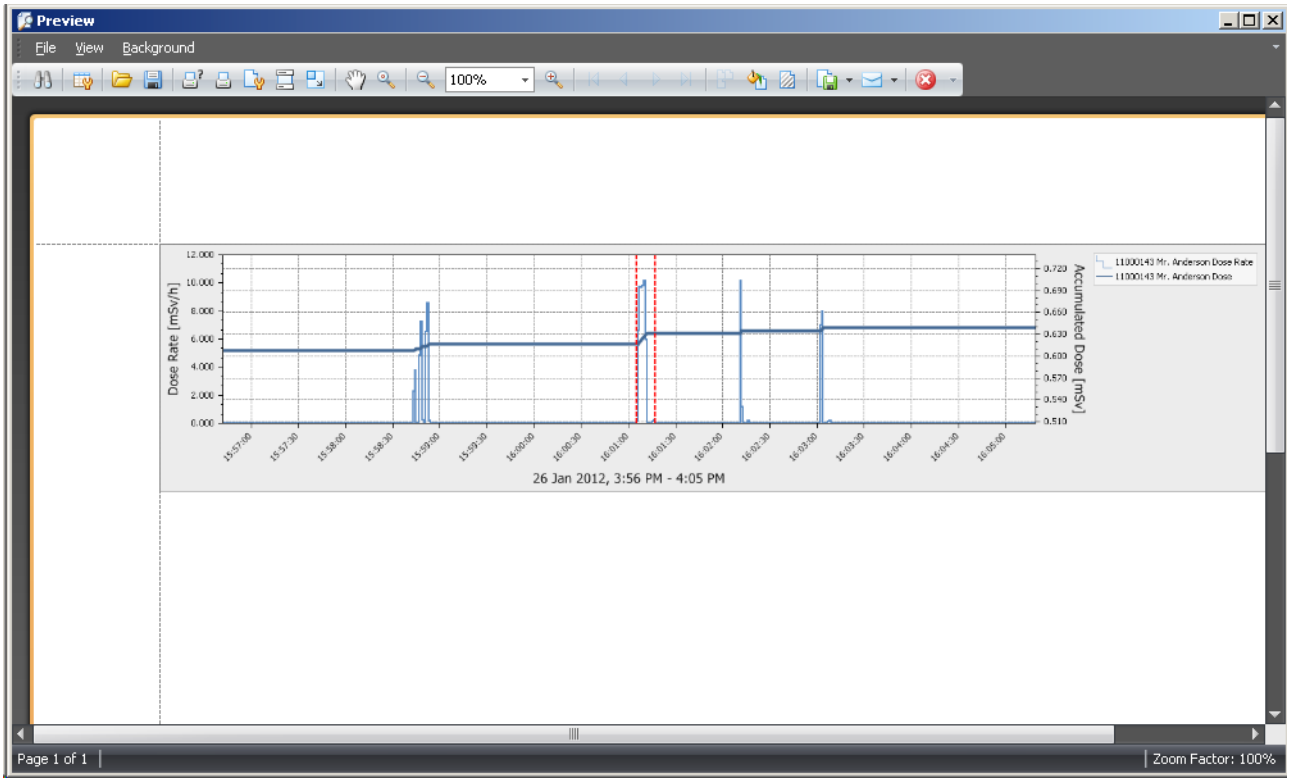

Figure 28. Print dose history

The currently viewed dose graph or dose table can be printed. The same data that is displayed will be printed. Follow the instructions below to print:

1. Enter the application menu and either select Print or continue with steps 2 – 3.
2. Select Print Preview to preview and customize the print area. In this menu you can also find tools to export and e-mail the current view.
3. Select Print.

EXPORT DATA FROM A DOSE TABLE

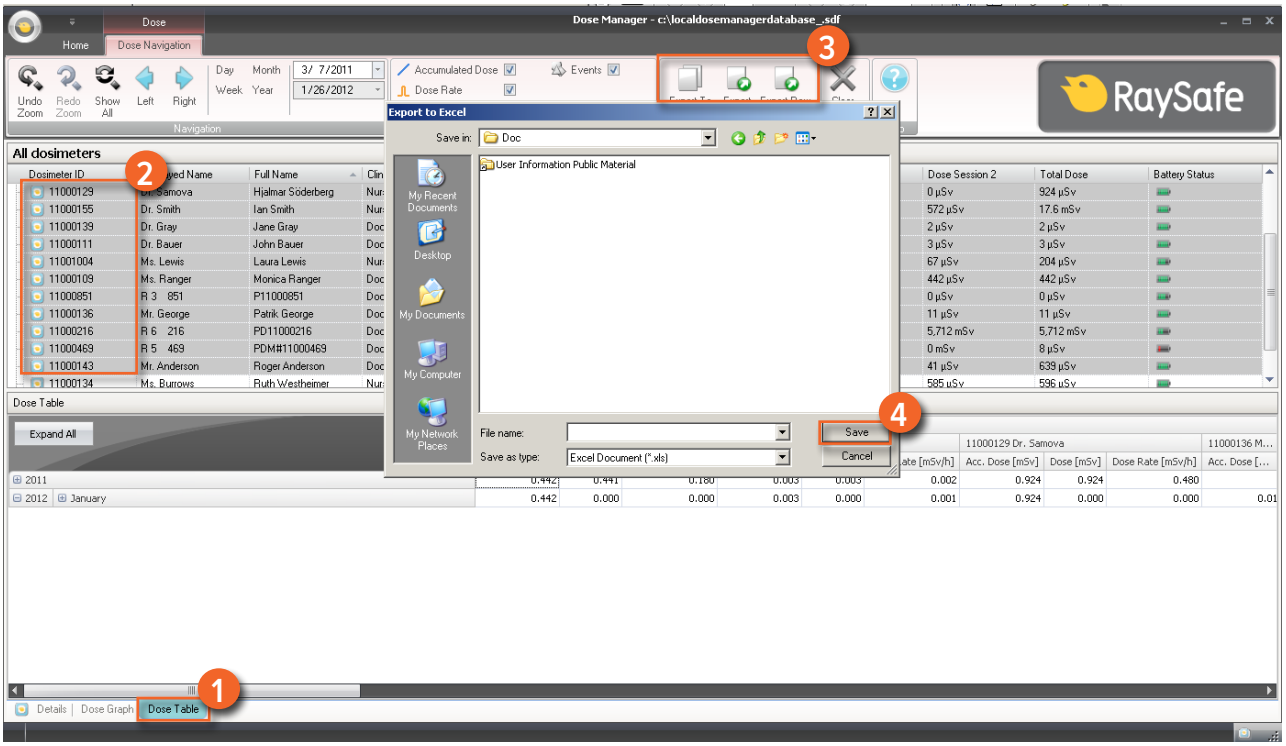

Figure 29. Export data from dose table

Follow the instructions below to export data from a dose table for further analysis:

1. Make sure that you are in the Dose Table view.
2. Select the dosimeter(s) from which you want to export data.

Note that all dosimeters in a selection may not have been exposed to radiation during the same time.

3. Click the Export button and select your preferred file format.
4. Save the document on your computer.

NOTE *Only the data that is currently visible in the dose table will be exported. Click the button Expand all to make all data visible.*

COPY SPECIFIC CELLS IN A TABLE

1. Make sure that you are in the Dose Table view.
2. Select the dosimeter(s) from which you want to export data.

Note that all dosimeters in a selection may not have been exposed to radiation during the same time.

3. Select the cells that you want to copy by clicking on the first and last row that are going to be included.
4. Copy the cells with the command ctrl + c.
5. Paste the copied cells in the target document with the command ctrl + v.

EXPORT DATA TO A TAB-SEPARATED TEXT FILE

1. Make sure that you are in the Dose Table view.
2. Select the dosimeter(s) from which you want to export data.
3. Note that all dosimeters in a selection may not have been exposed to radiation during the same time.
4. Click the Export raw data button.
5. Save the document on your computer.

NOTE *Only the data that is currently visible in the dose table will be exported. Click the button Expand all to make all data visible.*

ANALYZE DOSE DATA FROM SEVERAL DOSIMETERS

VIEW DOSE HISTORY AS A GRAPH

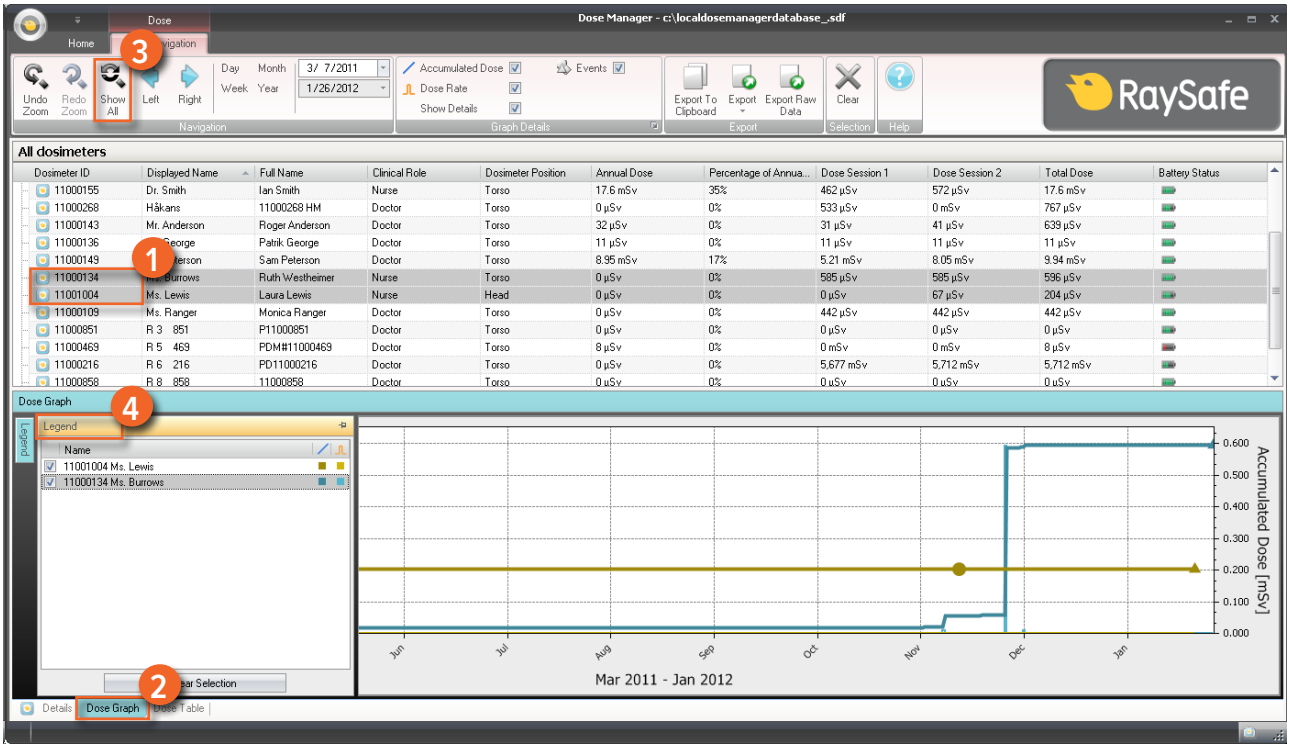

Figure 30. Analyze dose history from several dosimeters

Follow the instructions below to view dose history from several dosimeters as a graph:

1. Select **either**:

   - Several dosimeters in the All dosimeters window by holding down Ctrl while clicking on the dosimeters.

   Or

   - A group of dosimeters.

2. Click the tab Dose Graph to see the dose data presented as a graph.

3. Click Show all.

All available data for the selected dosimeters will appear. The time range will start the first date any dosimeter received dose and stop the last date any dosimeter received dose.

4. Click the button Legend to the left of the graph to see the graph legend.

To make the graph legend permanently visible, click the pin in the upper right corner. Click the pin again to hide the graph legend.

To change the graph colors, select a dosimeter and right-click on it. Select either dose graph color or dose rate graph color and choose your preferred color and click OK.

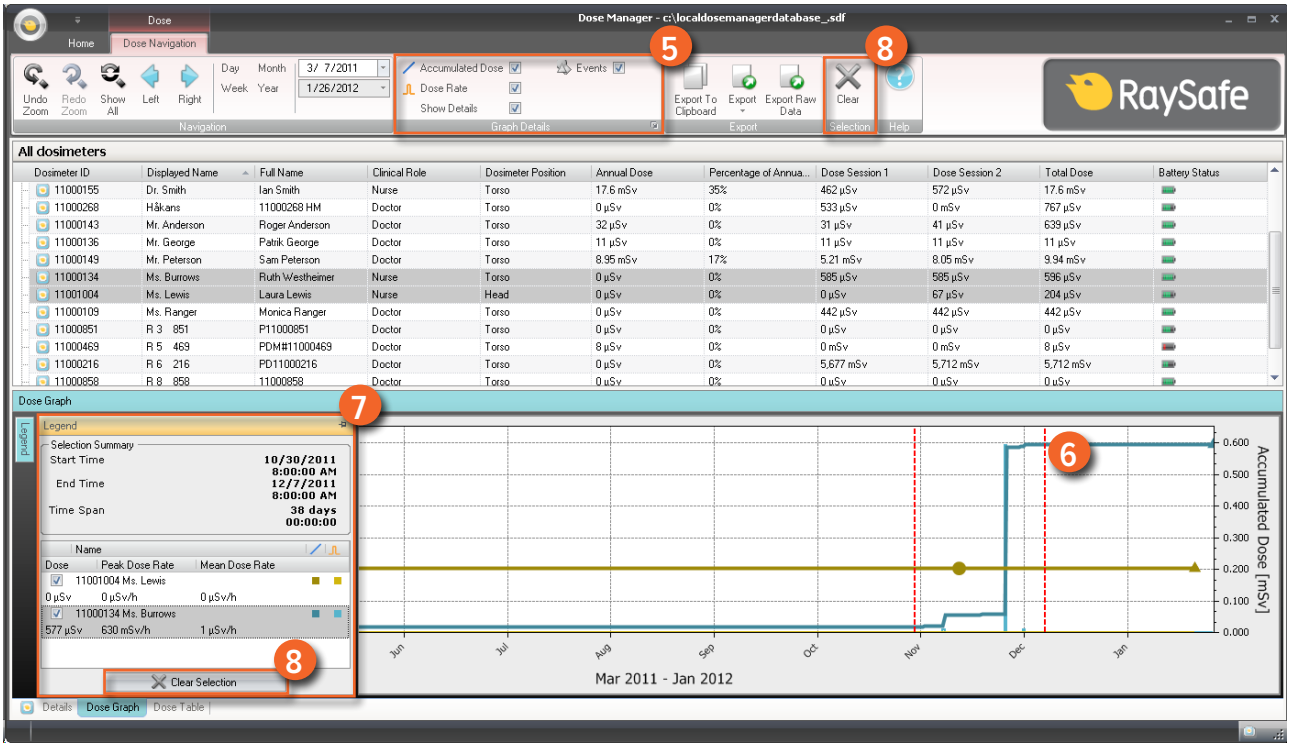

Figure 31. Make a selection in a graph

If you want to analyze a certain part of a graph further, follow the steps below to make a selection:

5. Make sure that the graphs you are interested in looking at are selected.
6. Click Shift in combination with using the mouse to left click and drag in the graph.

This makes a selection in a time span in the graph. The selection is indicated with vertical red dotted lines.

7. View information about this selection in the graph legend.
8. Click Clear, either in the graph legend or in the Dose Navigation toolbar, to clear your selection.

VIEW DOSE HISTORY AS A TABLE

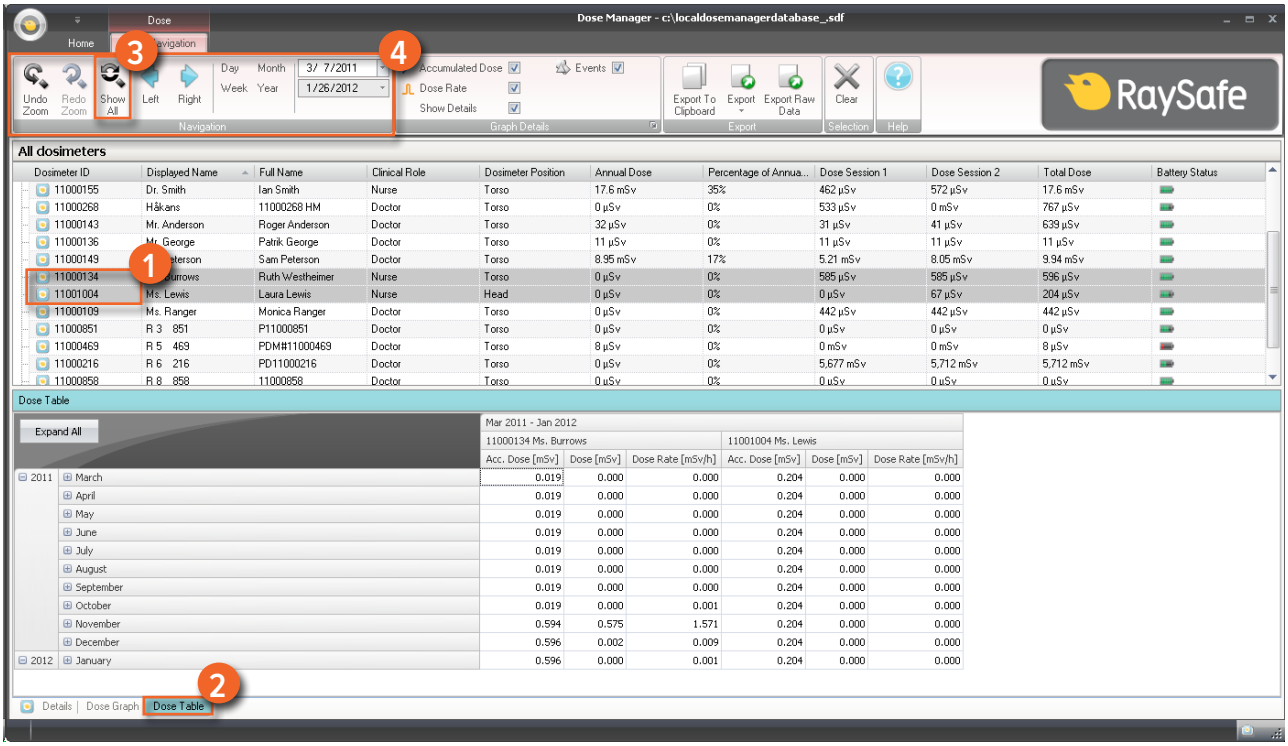

Figure 32. View dose history as a table

Follow the instructions below to view dose history as a table:

1. Select **either**:

   - Several dosimeters in the All dosimeters window by holding down Ctrl while clicking on the dosimeters.

   Or

   - A group of dosimeters.

2. Click the tab Dose Table to see the dose data presented in a table.

3. Click Show all.

All available data for the selected dosimeter will appear. The time range will start the first date the dosimeter begun to measure dose and stop the last date the dosimeter was synchronized.

4. Use the Navigation and Graph details toolbars in the Dose Navigation toolbar to customize the table and navigate in it.

NOTE *The data presented in the table depends on which time span is used.*

PRINT DATA FROM A DOSE GRAPH OR DOSE TABLE

See section “Print data from a dose graph or dose table” on page 43

EXPORT DATA FROM A DOSE TABLE

See section “Export data from a dose table” on page 44

REPORTS

You can easily create reports for further analysis of both separate dosimeters and groups of dosimeters.

CREATE REPORTS

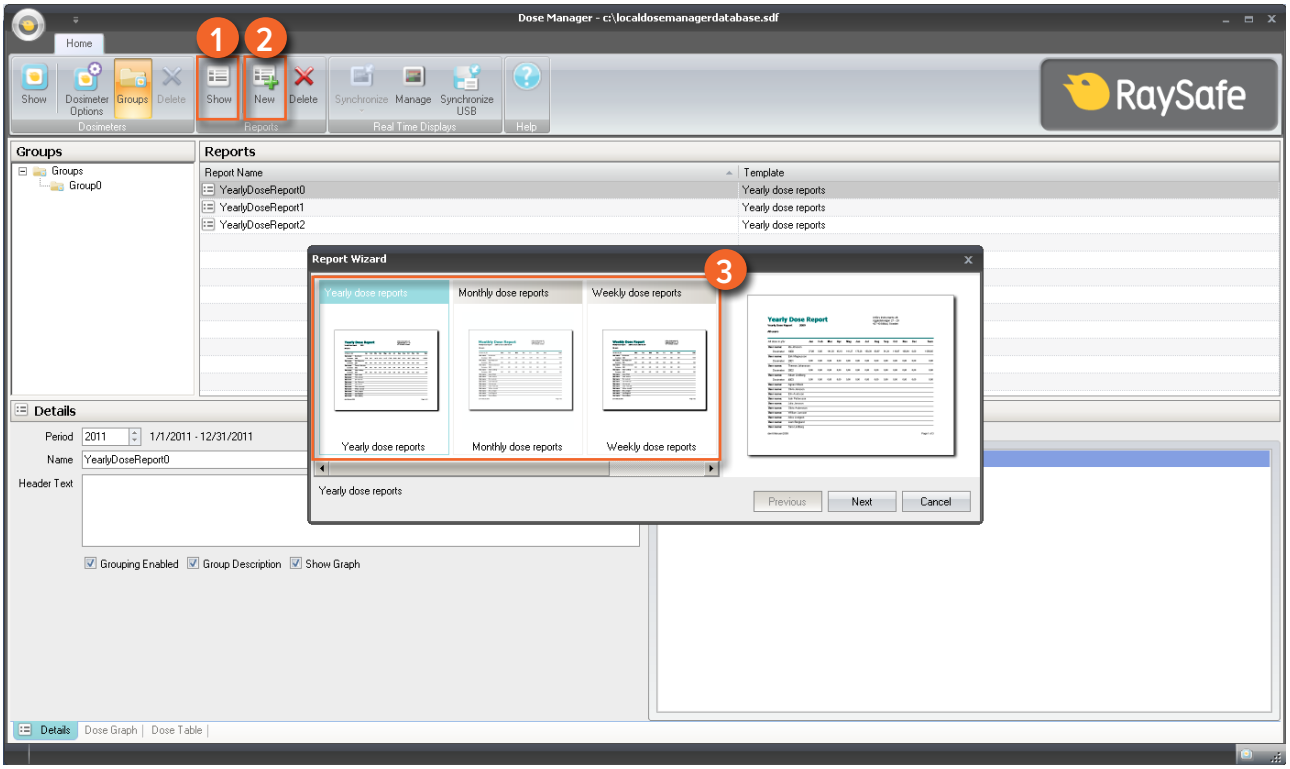

Figure 33. Create a report

Follow the instructions below to create a report for dose data:

1. Click the Show button in the reports group.
2. Click New.

Dose manager will open a Report Wizard.

3. Select one of the standard templates and press Next.
4. Select which dosimeter(s) and/or group(s) of dosimeters to include in the report by using the arrows and press Next.
5. Select the time range for the report.

If the end time for the report is in the future, for example if you make a report for the current year before it is ended, the report will be dynamically updated each month.

6. Click Create.

7. Access the report preview mode by double-clicking it in the Main toolbar. Exit the report preview by clicking Close.

EXPORT OR E-MAIL A REPORT

NOTE *To be able to e-mail a report you need to have an external e-mail client installed on your computer.*

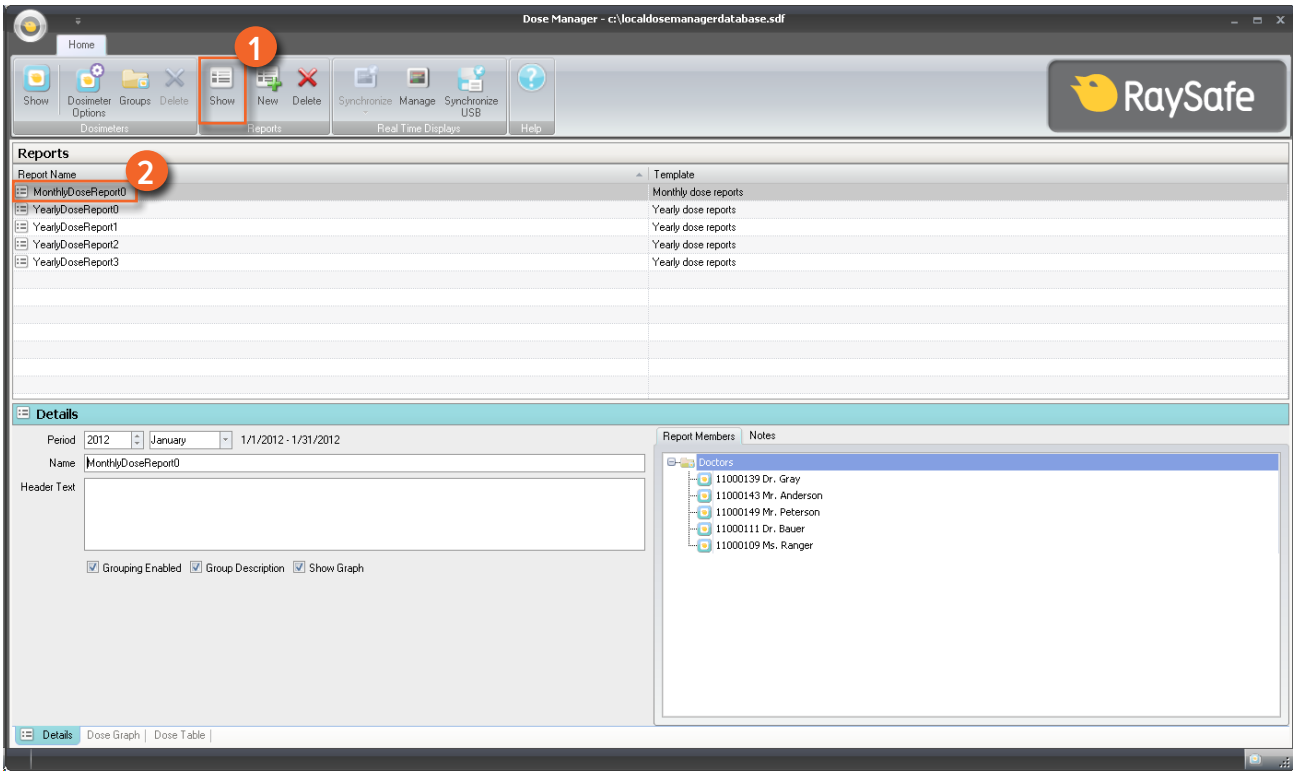

Figure 34. Select a report to export or e-mail

Follow the instructions below to export or e-mail a report:

1. Click the Show button in the reports group.

2. Double-click on the report you would like to export to enter the report preview mode.

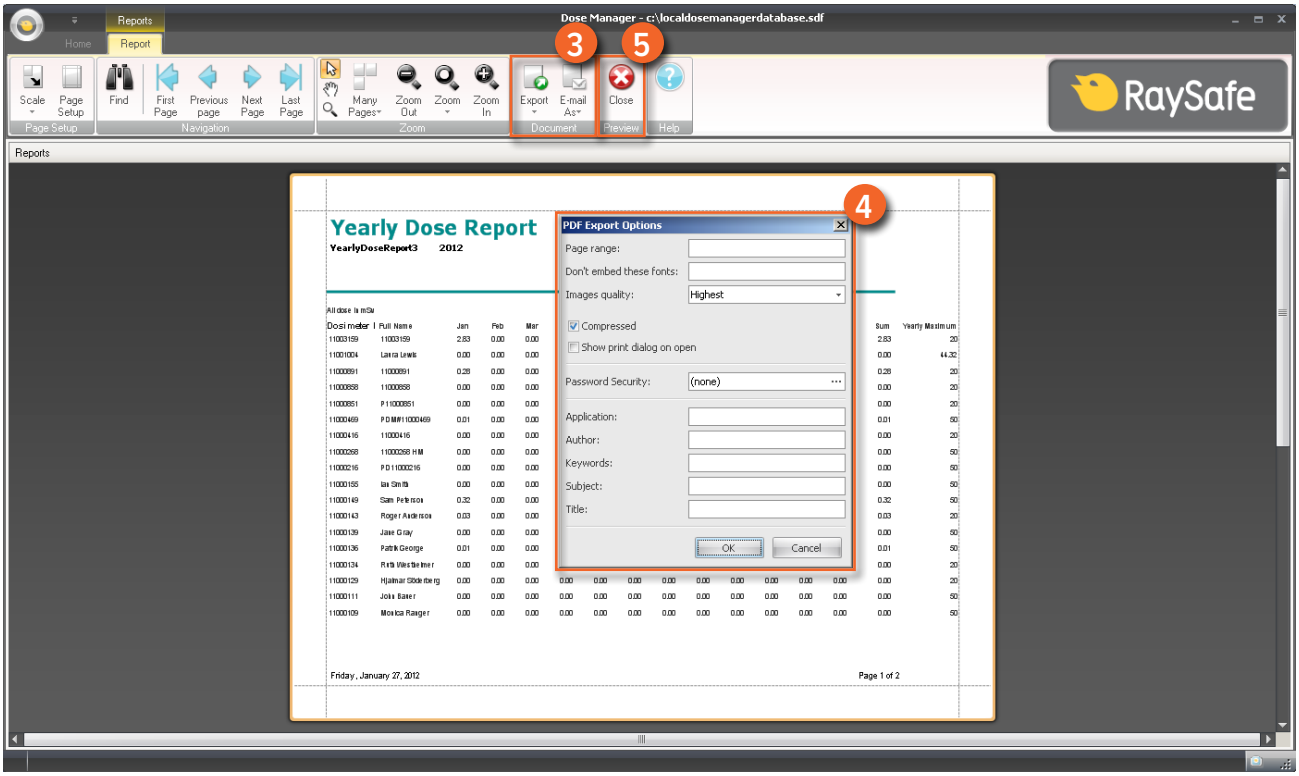

Figure 35. Export or e-mail a report

3. Select either Export or E-mail as in the Document toolbar and select the preferred file format.
4. Enter export options.
5. Click Close to exit the report preview mode.

DOSE MANAGER OPTIONS

SET PASSWORD

To protect the information stored in dose manager, it is possible to set an optional password that will be required when dose manager is launched. Follow the instructions below to set a password:

1. Click the Application menu.
2. Select Options.
3. Enter a password in the field New Password.

NOTE *Contact you local administrator for password guidelines.*

4. Repeat the password in the field Verify Password.
5. Click OK.

CHANGE PASSWORD

Follow the instructions below to change the current password:

1. Click the Application menu.
2. Select Options.
3. Enter your current password in the field Current Password.
4. Enter a new password in the field New Password.
5. Repeat the new password in the field Verify Password.
6. Click OK.

CHANGE LANGUAGE

Follow the instructions below to change the user interface language:

1. Click the Application menu.
2. Select Options.
3. Select your preferred language in the drop-down menu.
4. Click OK.
5. Re-start dose manager to apply the change.

DOSE MANAGER LICENSE

Dose manager shall be used only on the designated hardware and at the site of the licensee as specified in the Customer Software License Agreement. A separate dose manager is required per each designated hardware on which the dose manager is to be used.

USING THE DOSIMETER

INTRODUCTION

Figure 36. The dosimeter

The dosimeter is an active dose meter designed for maintenance-free usage throughout its lifetime.

You can personalize the dosimeter's appearance by attaching one of the 8 inlays of different color, which are delivered together with the dosimeter. (Select which color to show on the real time display, using the dosimeter options dialog, see "Figure 5. Dosimeter options, information tab" on page 13.)

The dosimeter measures staff dose. The optimal usage for the dosimeter to measure dose is to use it unshielded from any X-ray protection garment.

GETTING STARTED

Follow the instructions below to start using your dosimeter:

1. Make sure that the dosimeter's power mode is set to "On", see section "Change dosimeter information and settings" on page 33.
2. Attach the dosimeter on your clothes using the clip, which is located on the back of the dosimeter, or the lanyard holder that is provided with the dosimeter.

The dosimeter now records dose values and transmits them to real time displays within range. You can also read out the recorded dose values by using dose manager via the cradle (see section "Collect data from dosimeter" on page 35).

See section "Technical data" on page 58 to learn more about dosimeter memory.

USING THE CRADLE

INTRODUCTION

Figure 37. The cradle

The cradle is a dock station that lets you connect a dosimeter to a computer for data read out as well as dosimeter options writing into the dosimeter.

GETTING STARTED

NOTE *Do not connect the cradle to the computer unless dose viewer/dose manager and the cradle driver are installed on the computer.*

1. Start the dose manager application.
2. Connect a cradle to your computer's USB port.
3. Put a dosimeter in the cradle.

Within a few seconds, dose manager will detect the dosimeter. This is indicated at the top of the dose manager window by a note "Connected to dosimeter 100001158", where dosimeter 100001158 is an example of a dosimeter ID.

Dose manager will start loading the dosimeter dose history. This may take up to a few minutes. You can follow the progress on the progress bar at the bottom of the dose manager window.

TROUBLESHOOTING

DOSE MANAGER AND CRADLE

Table 24. Dose manager and cradle troubleshooting

PROBLEM	SOLUTION
The dosimeter does not appear in dose manager	Check that the dosimeter is correctly fitted into the cradle
Dose manager does not detect the cradle	• Check the USB connection between the cradle and the computer. • Install the cradle driver manually. All the driver files are located on the installation CD in the folder “CradleDriver”. These files are also copied to the application installation folder when dose manager is installed. When Windows detect a connected cradle and the dialog about driver installation is displayed, select to use the driver files located on the CD or in the application installation folder.
I have forgotten my password	Contact your local administrator, who will have to re-install the software

SYSTEM REQUIREMENTS

- Operating systems: Windows 7, Windows Vista or Windows XP.
- .NET 3.5.
- At least one USB port available.
- At least 2 GB of system memory available.
- At least 1 GB of hard disk space available.
- Recommended screen resolution at least 1280 x 1024.

OTHER USER MANUALS

- Dose viewer is described in a separate user manual, which can be found from the Help menu in dose viewer software.
- The dosimeters are described in a quick guide, delivered together with the dosimeter.

- The real time display is described in the system user manual..
- More information about installation and maintenance can be found in the service manual, delivered with the system.

TECHNICAL DATA

DOSIMETER AND REAL TIME DISPLAY/DOSE MANAGER MEMORIES

Dose rate samples that have been overwritten in the dosimeter's dose rate memory may still be available in the real time display and dose manager memories.

If there are no dose rate samples neither in the real time display or dose manager memories, nor in the dosimeter dose rate memory, the real time display and dose manager will instead display mean dose rate values based on accumulated dose values.

Lack of dose rate samples in the real time display and/or dose manager memories occurs when the:

- Dosimeter is not within range of the real time display when it is exposed to radiation.
- Dose rate samples in the dosimeter dose rate memory are overwritten.

TIME MANAGEMENT

The dosimeter logs dose history in local time with no daylight saving time adjustments. Daylight saving time adjustment is done in the real time display, dose viewer or dose manager when the dose history is presented.

The following happens when the daylight saving time is changed:

- When going to summertime, one extra hour with no dose data will be added to the dose log.
- When going to wintertime, two hours of dose data will be merged into one hour. This hour contains no dose rate details. When changing from summertime to wintertime, dose date details in the two merged hours will not be displayed.

SECURITY AND PRIVACY REQUIREMENTS

NETWORK PORTS

The following ports and protocols are open on the real time display for communication with the dose manager:

TCP/UDP	PORT NUMBER	PROTOCOL	ADDITIONAL NOTE
TCP	8070 g	SOAP httpd 2.7	Used for regular (bidirectional) communication between real time display and dose manager

TCP/UDP	PORT NUMBER	PROTOCOL	ADDITIONAL NOTE
UDP	8060	Proprietary discovery protocol	Protocol (bidirectional) used for real time display discovery

ENCRYPTION

RaySafe i2 data is encrypted during transmission, at rest on the real time display and is stored in an encrypted dose manager database.