

EOD-Tec

Manual



9000-608-74/30



DO NOT CROSS POLICE LINE

MADE IN GERMANY



Content

1. General	4	7. Image processing	56
Symbols used	4	General	56
Intended purpose	4	Graphic- and Image-Processing	56
Trademarks	4	Overview of Functions	57
Registration	4	8. Print	69
Storage of the data carriers	4	Setting up a printer	69
Data backups	4	9. Image archive	71
Effect on the computer	4	General	71
Copyright	4	Suitable archiving drives and storage media	71
Licence agreement for EOD-Tec software	4	Archive management	71
Operation	5		
EOD-Tec main window information	6		
System Requirements	8		
Installation	9		
Data backups	10		
2. Configuration	12		
Central activation of the software	12		
Configuration of the modules	15		
Configuration/Operator	15		
Configuration/organisation	18		
Configuration/language	21		
System info	22		
Short cuts	23		
Configuration/modules	24		
Module EOD-Tec (main module)	24		
Module "Project" (project tab)	26		
X-ray module	27		
Viewer module (light table)	28		
Archiving module	31		
Module CR Scanner	32		
3. Project index	34		
General	34		
Functions	34		
4. Light table	38		
General	38		
Global Image Search	38		
Functions	39		
6. X-ray	48		
Functions	49		
What to do after a PC crash	55		

1. General

Symbols used



Warning

Intended purpose

Capturing and management of X-ray images and their allocation to the project.

Trademarks

Windows XP and Vista are registered trademarks of Microsoft Corp.

DirectX™ and DirectDraw™ are registered trademarks of Microsoft Corp.

All other brands and product names are trademarks or registered trademarks of the respective manufacturer.

Registration

As a registered user of the EOD-Tec program, you are entitled to all the program functions (according to your ordered package) and a wide range of technical support services. You have to activate the registration in the EOD-Tec program, check the desired configuration, print out the registration form or enter the information in the registration form in the Annex if no printer is connected to your system. Send the completed registration form to Dürr NDT by fax or mail.

Dürr NDT GmbH & Co. KG

Höpfheimer Straße 22

D-74321 Bietigheim-Bissingen

Dürr NDT will then send you the valid activation code for your system. The software is not copy-proof. However, only one copy may be produced for backup purposes. Duplication of publication of the software or software documentation is not permitted without the prior approval of Dürr NDT.

Storage of the data carriers

According to the manufacturers, protect from

- Direct magnetic radiation (permanent magnet or electromagnet)
- Temperatures outside the admissible range
- Humidity outside the admissible range
- Physical damage (scratches, breakage, deformation, etc.)

Data backups

We recommend you carry out a complete backup of the software already installed on the computer before installation of the software. If the X-ray module is used (e.g. with CRScan), a regular backup of the EOD-Tec database file directory is imperative. Instructions on how to proceed can be found in chapter "Further information" (section "Data backup").

Effect on the computer

We do not assume liability for any effect on any software already installed on the computer.

Copyright

Copyright 2007 by Dürr NDT

Licence agreement for EOD-Tec software

– The Licensor grants the Licensee the non-transferable, non-exclusive right to use the "EOD-Tec" program in his/her organisation. Any other form of use, in particular any transfer to third parties, is not permitted. The EOD-Tec program may only be used by the Licensee when a legally valid licensing contract has been concluded. It is concluded by the payment of the software royalties and corresponding provision of the activation code.

- All rights to the software supplied and the manual, in particular duplication in any form or manner, are reserved by Dürr NDT GmbH & Co. KG. In the event of any infringement of the above-mentioned contract conditions, Dürr NDT GmbH & Co. KG shall be entitled to terminate the licensing contract without notice and to prohibit the further use of the software. Dürr NDT GmbH & Co. KG warrants that the software supplied to the Licensee is suitable for the intended use. Should faults occur in the program during the warranty period of 12 months, Dürr NDT GmbH & Co. KG will remedy these free of charge or supply new software. In the event that the remedy or replacement supply fails to overcome the faults in accordance with the applicable rules, the Licensee shall be entitled to return the software and demand the refund of the purchase price.
- No claims for damages will be accepted except in cases of intent or gross negligence or in the event of an infringement of cardinal contractual obligations by the Licensor. If data are lost in the Licensee's EOD-Tec database during the use of the software, Dürr NDT GmbH & Co. KG shall be liable for the damage caused only if the Licensee has backed up the data at intervals adequate to the application, but at least once a day, in a suitable form so that these can be recovered with a reasonable amount of work.
- Dürr NDT GmbH & Co. KG assumes no liability for material damage or personal injury of any kind resulting from the use of the software.

Operation

General

The operation of the program follows the Windows conventions. Attention will be drawn to any special operations at the corresponding point in the manual.

Mouse

Click:	Click left mouse key once and release it
Double click:	Click left mouse key twice
Right click:	Click right mouse key once and release it
Drag&Drop (drag left):	Position mouse pointer on the object, press the left mouse key and keep it pressed while moving the mouse. Release the mouse key when reached the desired position.
Take&Drag&Drop :	Click on object, move object by means of the mouse and release the object by clicking again.

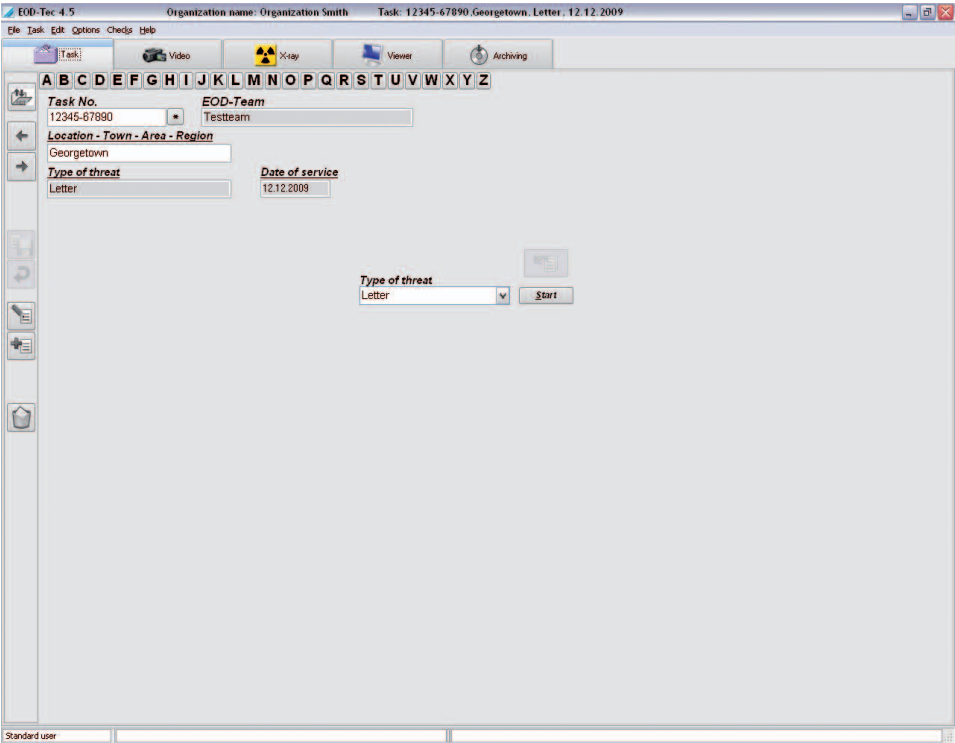
The following description refers to Windows default settings (right-hand mouse)

Click:	Activate or initiate a function. Select a menu item or function.
Double click on the object:	Activate object or image-related functions (e.g. image processing).
Right click:	Load the context menu.
Drag&Drop :	Move or copy objects between Drag&Drop-capable objects or applications.
Take&Drag&Drop :	Draw graphic objects with start and end points. (e.g. luminance/contrast controls)

Keyboard

Via the keyboard you can activate the menus of EOD-Tec and make inputs.

EOD-Tec main window information



The main window is divided into:

- 1. Header bar (top)
- 2. Menu bar with the menus "File", "Project", etc.
- 3. Modules (tab sheets) with the tabs "Project", "Video", etc.
- 4. Function bar (left-hand column)
- 5. Status bar (bottom)

The organisation name and the currently selected project are displayed in the header bar.

The user logged in and the last logged in project are displayed in the status bar.

Error log

Errors or messages occurring during the program run are logged by a Logserver that is also started at each program start; the log is automatically written to a file on closing the program. These files (logx.rtf) are saved to the directory ".\EOD-Tec\bin" and can be consulted in the event of problems. The Logserver can be seen in the Windows taskbar in the bottom right-hand corner during the running of EOD-Tec.



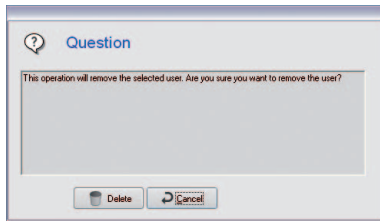
You can view the Logserver by double clicking to show all the messages due to errors or warnings. Right clicking on the Logserver icon in the Windows taskbar allows you to quit the Logserver via the menu point "Quit".



Please do not quit the Logserver while EOD-Tec is running!

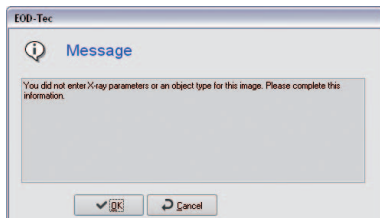
Dialog window

Question



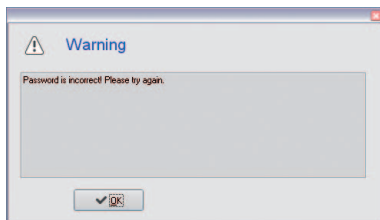
A question window appears as a safety feature that allows you to confirm, deny or cancel an action.

Message



Messages give information relevant to an instruction that has been carried out.

Warning



A warning appears when an instruction could not be carried out or could only be carried out in part.

General Menus/Functions

Quit (File menu)

Returns to the login status to change user information or to end the program.

Configuration (Options menu)

Under this menu point you can activate and deactivate the display of the configuration tab.

Contents (Help menu)

Contents.

Help (F1) (Help menu)

Displays help on the current module.

About EOD-Tec (Help menu)

Registration of the program and display of the registered modules and versions.

System Requirements

Hardware and Software

The PC and its components (monitors, printers, etc.) must conform to IEC 60950 (EN 60950). The safety demands on the PC system may differ, depending on the combination with other peripherals (video camera, scanner); further information can be found in the respective user manuals.



Operating systems are constantly developed further to meet the growing requirements of the users. Today Windows XP and Vista offer professional operating systems with sufficient multimedia functions. We recommend one of these operating systems for reasons of system stability and data security. If more systems are connected to the PC, the minimum requirements may change. Observe the minimum requirements of all connected systems.

CB

PC

See document "Minimum requirements of computer systems for imaging"

Data backups



Archiving is not for data backups. It serves only for backing up image data from the EOD-Tec database. The EOD-Tec database must be backed up with the daily data backup.

NTFS is urgently recommended as file system for the storage medium of the EOD-Tec database, DBSDATA! An existing FAT32 file system can be converted to NTFS with the Convert.exe Windows program!

DirectX Version 8.x or higher

Extension for Dürr NDT X-ray recording system, CRScan



The Dürr NDT X-ray recording system, CRScan, uses important data whose loss may, in some cases, necessitate a new X-ray image. The program was designed to avoid data loss if possible. In order to guarantee this stability, the following minimum system requirements are demanded for operation of the Dürr NDT X-ray recording systems: Long-term archiving system using storage media with long-term stability (MOD, WORM, CDR, DVD-RAM). Recommended: MOD with high-speed PCI-SCSI-2 controller

Monitor

17" monitor with 0,26 mm pitch

Horizontal frequency to 92 kHz, vertical frequency to 160 Hz

TCO 95, MPR II, TÜV-GS, CE mark and X-ray Ordinance



Depending on the graphic card monitor combination used and its settings (e. g. resolution, depth of colour, contrast, brightness) the quality of the monitor display can be very different. Particularly the grey levels and the detail precision can differ. If the on-screen display of X-ray images is to be used for analysis purposes, it is necessary to determine during the consistency check whether the monitor has a sufficient display quality.

Printer

In principle, all printers that can be activated under WINDOWS

Installation

General

We recommend you carry out a complete backup of the software already installed on the computer before installation of the software.

In order to install the software on your system, it must satisfy the data stipulated in chapter "System requirements".

Place the EOD-Tec CD-ROM into a suitable drive. The installation program starts automatically.

Should this not be the case, start the file install.exe from the main directory of the EOD-Tec CD-ROM.

Stand-alone installation

To carry out a stand-alone installation, select "Application and database" at the beginning of the installation. You will be guided through the routine and can change the default paths suggested by the program. After successful installation you will find EOD-Tec under the item of the Windows Start menu selected during the installation and as an icon on the desktop.

Network installation



If the program is installed in a network, all workstations need to be linked to the database drive in the same way.

You have to assign a drive letter to the server path (drive) at each workstation using the same DBSWIN database. This drive letter must be identical on each station. In order that there are no conflicts with existing drives, you should select a drive letter near the end of the alphabet (e.g. X, Y or Z). Keep in mind that all access rights for the new drives must be set.

First workstation / database

During the installation of the first workstation, select "Application and database" to set up the first workstation and at the same time the database on the server. All inputs up to the page "Database directory" of the installation refer to the local workstation installation. Now assign the database directory to the drive letter which was assigned to the server path before. The next window that appears is "Note for multi-workstation systems". Please note down the path shown, because you will need it for the installation of other workstations. Select all remaining directories and complete the installation.

Other workstations

To install a further workstation for operation with the network database, select "Application only". All inputs up to the page "Find data directory" of the installation refer to the local workstation installation. On this page, select the directory that was displayed during the database installation under "Note for multi-workstation systems". Select the EOD-Tec icon from the corresponding group of the Start menu.

Data backups

Necessity



A backup of the data is absolutely necessary since the failure of the system can lead to a loss of data. A data backup also protects you, however, against data losses caused by operator errors or destruction (fire, water, etc.) of the system. The data backup must not be confused with the EOD-Tec archiving, because only images with the corresponding data can be backed up using the archiving.

EOD-Tec data

The image and project data of an EOD-Tec standard stand-alone installation are located in the directory C:\EOD-Tec\dbsdata. If you have not used the standard installation, you can check in the configuration menu under tab “Organisation” where the data of an organisation are stored. Details can be found in section “Configuration”.

Methods

If you wish to back up the data on your hard disk to a streamer tape or other backup medium (streamer, external hard disk, etc.), you do not necessarily have to copy all the files at every backup. Once installed, the program files (e.g. Microsoft Windows, Microsoft Excel, etc.) generally remain unchanged. It is not necessary to back them up on tape every day. On the other hand, it should be possible to restore all changes and new files of a working day at any time. You should organise your data backup optimally using a combination of the following backup methods.

Full backup

All files are saved from all sub-directories of a selected drive. Every backup program allows certain files or directories to be excluded even from a full backup – e.g. the backup program proper (because this would have to be installed from the CD-ROM anyway in the event of a system crash) or temporary working directories.

Incremental backup

An incremental backup - unlike a full backup – saves only those files which have been changed since the last backup. In addition to the file name and the file date, every file has an identifier or archive flag. In a full backup this identifier is deleted, it will be set again by each subsequent write access to the file. You can restore the condition of your PC to an arbitrary day by using a full backup. This is particularly useful if you notice a deficiency in a database or a virus infection some days later. The latest backup could include already deficient files. The incremental backup alone holds a risk however. In order to completely restore your PC, you first have to restore an old full backup. Then you have to read in all created incremental backups in succession. Only in this way is it possible to be sure that all changes are really reconstructed. This can be extremely time consuming. Therefore, it is useful to intelligently combine incremental backups and full backups.

Backup strategies

With a combination of full backups and incremental backups, you can restore the data at any time up to three months. Should even one backup media streamer tape be destroyed, the procedures described here guarantee that you will not be left with a loss of any great consequence – and never a total data loss. Only the changes of a single day may be lost. The procedures described are suitable, of course, for every backup medium, e.g. for Zip drives or streamer tapes. To ensure high data security, you will need nine streamer tapes (or changing media). Label these as follows:

- Tape 1 : Monday
- Tape 2 : Tuesday
- Tape 3 : Wednesday
- Tape 4 : Thursday
- Tape 5 : Friday 1
- Tape 6 : Friday 2
- Tape 7 : Friday 3
- Tape 8 : Month 1
- Tape 9 : Month 2

Start with the backup on a Friday by writing one full write backup onto the Friday 1 tape. Carry out an incremental backup on the corresponding media on Monday, Tuesday, Wednesday and Thursday of the following week respectively. The following Friday start another full write backup, but this time use the Friday 2 tape. The following week write an incremental backup each day onto the Monday to Thursday tapes accordingly without deleting the backups already stored on these tapes. On the following Friday start a full backup again and use the Friday 3 tape for it. The schedule remains unchanged for the week after this; instead of the Friday 4 tape that is not available, use the Month 1 tape for the full backup. This backup schedule is repeated for a month, then write a full backup to the Month 2 tape. The cycle then begins again from the beginning. All media on which full backups have been written (Friday 1, Friday 2, Friday 3, Month 1 and Month 2) must be deleted or typed over before you can use them again. You should only delete the media with the incremental backups if the size of the incremental backups requires this every four weeks. Simply changing database files each day maximises the incremental backups enormously. The data compression of the backup software also works more effectively here.

Simplified Backup

For smaller amounts of data this backup schedule can be simplified; then only four tapes are necessary. Label these as follows:

Tape 1 : Monday / Wednesday

Tape 2 : Tuesday / Thursday

Tape 3 : Week 1

Tape 4 : Week 2

Start on a Friday with a full-write Backup to the tape Week 1. Write the daily updates Mondays and Wednesdays on tape 1, Tuesdays and Thursdays on tape 2. On the second Friday, use tape 4 for a full-write backup. The cycle starts from the beginning again. With this scheme the data of up to three weeks can be restored.

Equipment

Due to their data capacity and low data security, diskette drives are not suitable as backup devices in EOD-Tec. In principle any drive can be used for backup. Here are some examples:

- Tape drives (streamers)
- External hard disk drives (Syquest, Iomega, ...)
- Iomega Zip drive
- MO drives (Fujitsu, 3M, HP, ...)
- CD-Writer/-Rewriter
- DVD-RAM
- DVD-R
- DVD+R
- Blue Ray disc (BD-R)

2. Configuration

Central activation of the software

In order to be able to use EOD-Tec 4.5 with the desired range of functions, you have to carry out the activation. Without activation, you can only manage 1 project even with the full range of functions of the software. Furthermore, only 50 program starts are possible.

To carry out the activation, proceed as follows.

Transmission of the registration data

Note that additional costs can accrue during the registration. The prices can be found in the latest Dürr NDT price list or obtained from your dealer.

Start the EOD-Tec 4.5 software.

The "EOD-Tec" registration window appears.



You can also call up the registration later in the menu "Help" with the menu item "About EOD-Tec".

Click on the "Register" button.

The "Activate" dialog window appears.

Registration

EOD-Tec-Registration
 Dürr NDT GmbH Co. KG
 Hopfigheimer Str. 22
 D-74321 Bietigheim
 E-Mail: info@duerr-ndt.de
 Tel. 07142/99381-0 Fax. 07142/99381-299

System
 Helmut Tanner
 TANNER AG
 Microsoft Windows XP
 1042 MB RAM
 Intel(R) Pentium(R) 4 CPU 2.40GHz
 Station No. CPU-Cores: 1
 744046677

Your Address
 Name
 Street
 Postcode Town/City
 Country
 Tel.: Fax:
 E-Mail:

Dealer's Address
 Name
 Street
 Postcode Town/City
 Country
 Tel.: Fax:

Serial numbers (please fill in as necessary)
 Camera basis station VistaProof
 Camera handpiece
 CRScan
 CRRay

EOD-Tec v4.5 Build 6487 (Unregistered)	You have now	You would like to buy
Video Module	No	<input type="checkbox"/>
Xray Module	No	<input type="checkbox"/>
EOD-Tec V 4	No	<input checked="" type="checkbox"/>
Expert Module Image Processing	No	<input type="checkbox"/>

Please fill-up the formula, print it out and fax it to Dürr!

✓ Ok ↻ Cancel

The buttons in the left area can be used to reach the further dialog window in order to enter the data.



Form

With this button you switch to the dialog window in which you enter the necessary order data.

Enter the necessary data in the "Your address" field and in the "Serial numbers" field.

In the lower part of screen in the column "You wish to purchase", activate the check boxes of the modules you wish to activate. In the column "You now have" you will see any modules that have already been activated.

The EOD-Tec module is selected as standard and has to be activated.

Carry out the registration by telephone, per fax or per e-mail.

For registration by telephone, keep the data on the order form and the "Station no." ready at hand.

The station number is specified in the "System" field.



Print order form



Export order form



Send the order form per e-mail

Enter the release code centrally



Code

With the button, change to the dialog window in which you enter the "DBS Code" that you receive from Dürr NDT.

When you have received the code from Dürr NDT:

Start the EOD-Tec 4.5 software and call up the registration window.

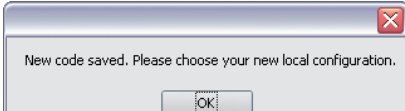
Click on the "Code" button.

Enter the "DBS Code".

The central activation code can be entered at any workstation in the network.

Confirm the input with "OK".

A message appears.



Confirm with "OK".

The dialog window for activation of the locally available modules appears.

Configuration of the modules

General

At the start of EOD-Tec, the tab "Configuration" is deactivated. The tab "Configuration" is displayed by clicking the menu "Options/Display configuration" in the menu bar. Basic properties of EOD-Tec can be polled and set in the tab "Configuration".



Please note that incorrect settings may result in malfunction and loss of data!



Configuration/Operator

General

Under the tab "User", various persons can be authorised for the use of EOD-Tec. It is possible to assign different users to each organisation. Each created user can have individual or all access rights of individual organisational divisions.

Login required

If you deactivate the check box "Login required", the program start and fundamental changes to functions and performance features of EOD-Tec can be made in EOD-Tec without the input of a password. With the help of the "Login required" check box, you can generally control the use of the device by authorised persons. The input of a password is requested at the start of EOD-Tec and in the event of changes to functions and performance features of EOD-Tec.

Meaning of the displayed dialog fields

"Status":	Name of currently logged in operator
"User":	List field with created users for the current organisation
"Password":	Password of the operator
"Full name":	Full name of the operator
"Abbreviation":	Short form of the operator name
"Organisation":	List field with created organisations
"Function":	List field with function designations
"Access rights":	List of the access rights to organisations

The Login window



The organisation of the selected user is displayed. If the user is assigned to several organisations, the desired organisation can then be selected from the list.



Entering passwords
If the names for user and password are identical, the password does not have to be entered at login (e.g. "User" = Brown, "Password" = Brown). If the check box is empty, EOD-Tec can be started without input of the user and password. Please note that this option does not allow any security with regard to unauthorised access.



Change operator

There are two ways of changing the active EOD-Tec user.

In the program

The active user is displayed in the status bar at bottom left. By clicking on the "Name"; if a user is logged in, another user of the current organisation can be selected.

Starting and ending with Login window

End the program up to the login window. Choose the required operator name from the list displayed and enter the correct password The organisation of the selected user is displayed. If the user is assigned to several organisations, the desired organisation can then be selected from the list. Confirm your selection by pressing the "Login" button. The operator is now logged in. The current operator name is now displayed at the bottom left of the screen.



If a user is not assigned to the selected organisation, the system switches automatically to the organisation to which the user is assigned.



Edit operator

You require the corresponding administrator rights for editing users and access rights in EOD-Tec. The edit mode is activated by clicking the "Edit operator data" button. Make changes in the text fields for full name, abbreviation, organisation and function.



Save operator

On completion, changes are saved by clicking the "Save" button. The changes will be rejected by clicking the "Reject" button.



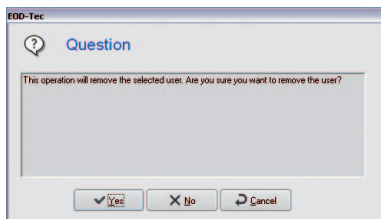
New operator

You require the corresponding administrator rights for editing users and access rights in EOD-Tec. Clicking the button "Edit user data" activates the edit mode and all text fields are emptied. Make entries in the text fields for full name, abbreviation, organisation and function.



Delete operator

You require the corresponding administrator rights for deleting users and access rights in EOD-Tec. Choose the appropriate operator name from the list. Click on the "Delete operator" button to start the deletion process.

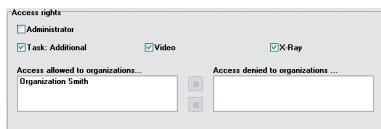


The operator will be definitively deleted by clicking the button "Yes".



Authorised access

The access rights in EOD-Tec can be set individually for each user. Care should be taken to allow only a small number of suitable users to have Administrator rights.


"Administrator":	Creating or editing user data Creating or editing organisation data Configuration
"Project: Extra":	Display the additional information on the current project by clicking the button "Info"
"X-ray":	Access rights to x-ray module



By marking the individual functional areas of EOD-Tec, you can assign individual access rights to each user. If the "Administrator" function is assigned, this operator will have full access. If the user is to have access to several organisations, click on an organisation name in the right-hand selection list.

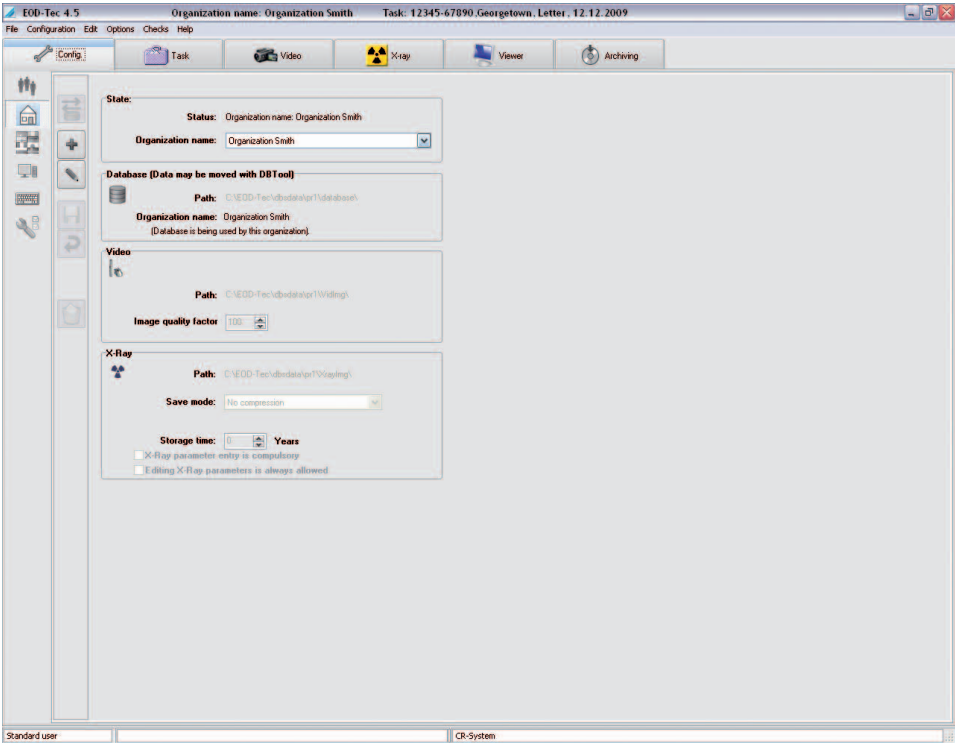
A click on the button  assigns the organisation to the user.
To delete an entry, click on an organisation name in the left-hand selection list and then click the button .

On completion, save the changes by clicking the button .

The changes will be rejected by clicking the button .

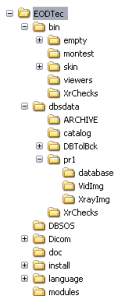


Configuration/organisation



The directories for database, video and X-ray images can be found under the tab "Organisation". This is necessary if you wish to create and manage further organisations. The directory entries are kept separately for each organisation.

Directory structure within EOD-Tec



A database directory "..\dbsdata" is created for each organisation (first organisation = \pr1\..., second organisation = \pr2\..., etc.). The corresponding database can be found in each organisation directory under the subdirectory "..\database". In the organisation directory, the video images are also stored in the subdirectory "..\Viding" and the X-ray images in the subdirectory "..\Xrayimg". Each organisation is assigned an organisation identifier when the organisation name is created.

Moving the database

The complete directory "..\dbsdata" can be shifted to another path (also in the network) using DBTOOL. The directory "..\dbsdata" must then be linked again using DBTOOL at the other EOD-Tec stations.



Create new organisation

To create a new organisation, click the button "Create new organisation". The data fields are emptied and you can now enter a name for the organisation or database to be created. The program paths will be automatically suggested. However, it is possible, to enter your own program paths. Repeat these steps for the X-ray path.



Save

Save any change by clicking the button "Save new or edited/changed user data". The changes will be rejected by clicking the "Reject" button.



Edit organisation

To edit the current organisation data, click the button "Edit organisation data". You now have the possibility to change the organisation name and to assign new paths. This is necessary if the position of the files has changed (directories were moved, backed up). On completion, changes are saved by clicking the "Save" button. The changes will be rejected by clicking the "Reject" button.



Delete current organisation

If you have administrator rights, you can delete individual organisations. Select the organisation to be deleted and click the button "Delete current organisation". The appropriate entry will be deleted.



Only the path instruction will be deleted and not the paths themselves. This must be carried out manually, in this case via Explorer.



Change organisation

To change to another organisation, click on the pull-down field alongside the currently displayed organisation. A selection list is displayed with all the organisations available within EOD-Tec. If available, select an item from the list and confirm with left click. To change to the selected organisation, click the button "Change organisation". The active organisation is displayed at the top edge of the program window.



X-rays

In the field "Storage time" you can set how long X-ray images are to be stored in the database. X-rays produced within this period cannot be deleted. You can select whether the entry of X-ray parameters is necessary for an X-ray image or not with the "X-ray parameters are mandatory entries" check box. If you want to change these parameters later, the "X-ray parameters always changeable" check box must be set.

There are three methods of storage for X-ray images (the file size and image quality values are not fixed, they are dependent on a number of factors):

- No compression (100% file size)
- Loss-free compression (50–60% file size)
- Lossy compression (100 = 40–50% file size; 90 = 20–30% file size)

X-Ray

Path: C:\Eod-tec\Dbdata\p12Vrayimg\

Save mode: No compression

Storage time: 0 Years

☒ X-Ray parameter entry is compulsory

☐ Editing X-Ray parameters is always allowed

X-Ray

Path: C:\EOD-Tec\dbdata\p1\Vrayimg\

Save mode: Lossy compression

Image quality factor: 100

Storage time: 0 Years

☒ X-Ray parameter entry is compulsory

☐ Editing X-Ray parameters is always allowed



The compression ratio chosen will depend on national regulations concerning storage of dental images!
We recommend that "No compression" is set.

In general, the image loading time will increase, the lower the compression ratio. With the lossy compression, an image quality factor of 100 means that the image information will be theoretically 100% restored.



The images must be saved loss-free to ensure a lasting valuability of the X-ray images.

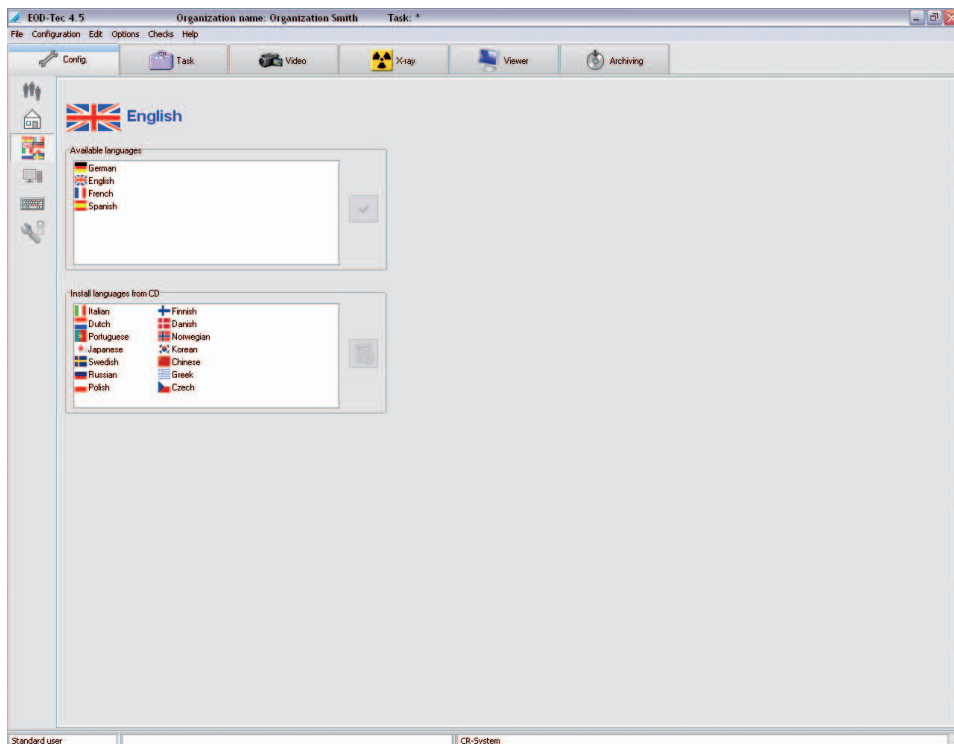


Database

Here the path to the currently used database and the organisation identifier linked to this database are displayed.



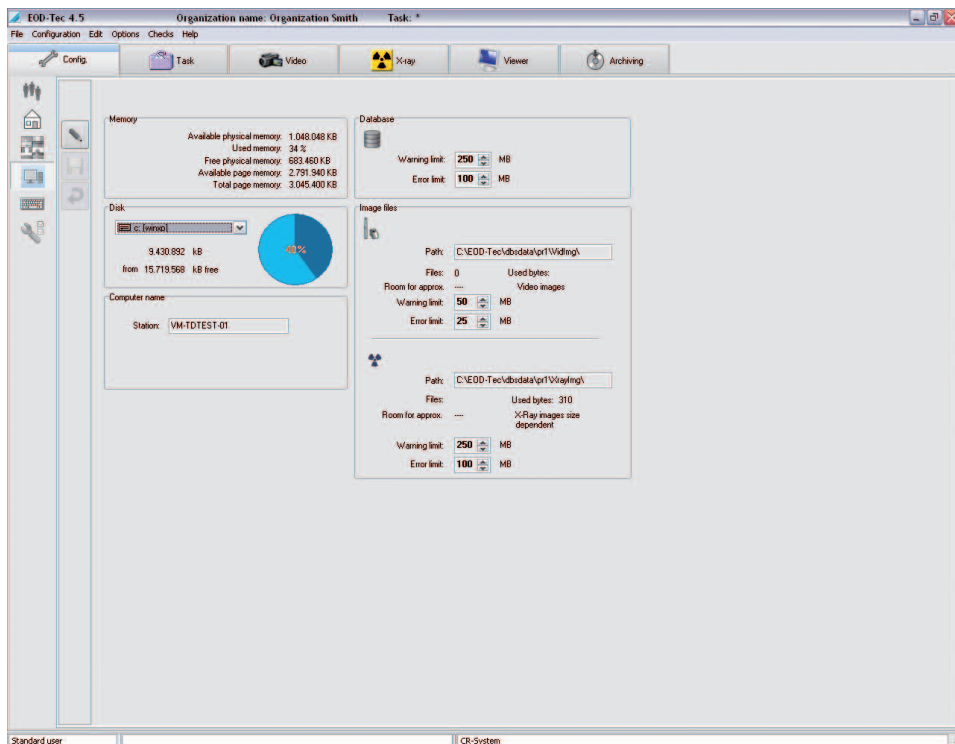
Configuration/language



EOD-Tec supports several national languages. During the initial installation, the two languages German and English are installed. To switch to the required language, left click (left-hand mouse button) on the appropriate language in the upper table. Confirm the selection by pressing the "Change language" button (on the right-hand side, next to the "available languages" selection list). The changeover to the new language takes effect the next time the program is started! National languages not yet installed can be selected in the lower selection list with the left mouse key and install these from the EOD-Tec CD-ROM by clicking the button "Install selected languages from CD-ROM" (on the right of the selection list "Install languages from CD-ROM").



System info



Information such as memory occupancy and system utilisation is displayed on this page. The following fields can be edited by the administrator. Click the "Edit system info" button. The name of the computer can be edited. Each station computer should be assigned an individual and unique name for identification purposes when working in a network.

Warning/error limits

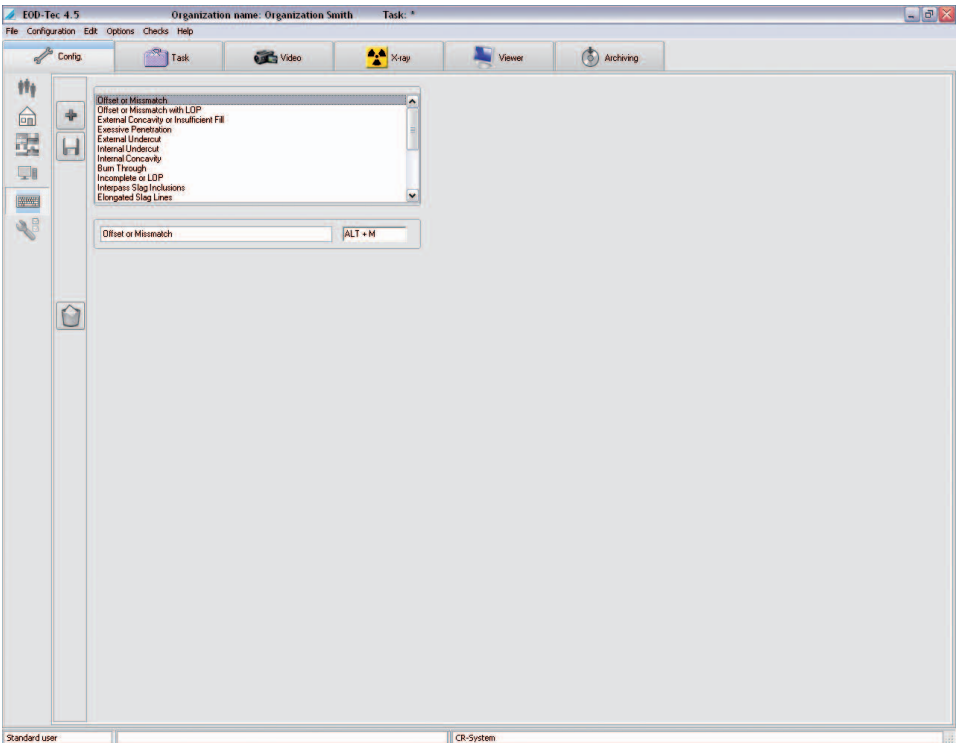
Warning or error limits can be set in the "Database" field or in the "image files" field. In the case of available memory not being sufficient and falling below a preset value, the system then sends a warning message. In the case of the error limit being reached, no more new data or images can be entered.



Set the Warning Limit to a value that gives you sufficient time to react, for example, to rearrange data storage or provide a new data carrier.



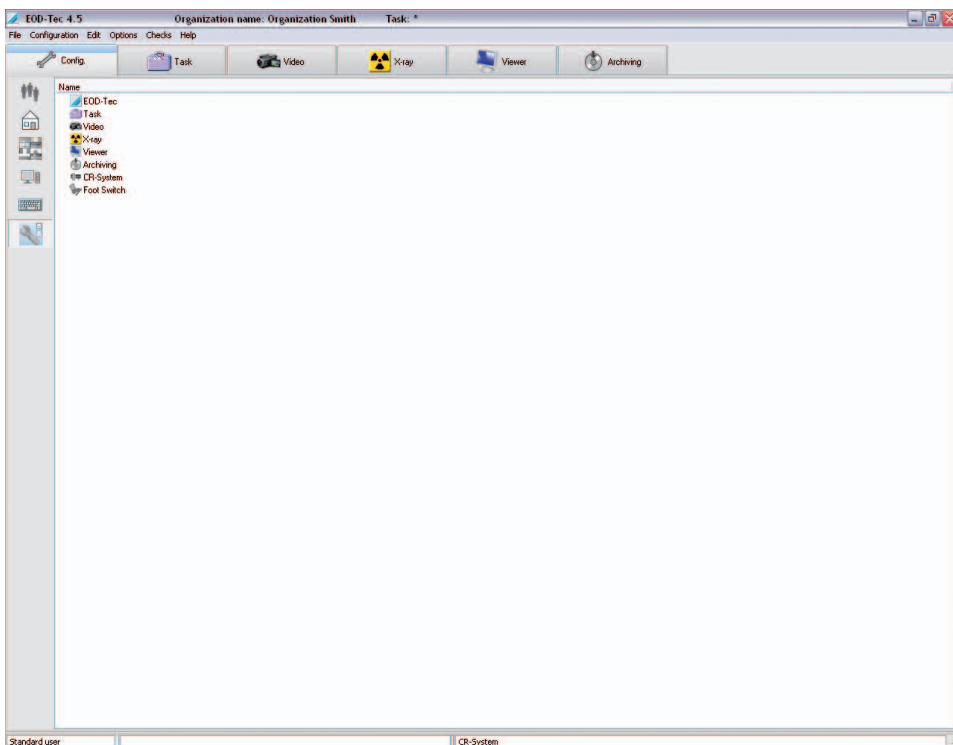
Short cuts



The short cuts allow you to enter comments or evaluations in the image information box more quickly. The assignment of the short cuts can be amended here. You can edit existing terms in the edit field under the selection box and add new terms by clicking the button "Create new short cut". The right field displays the key combinations entered. Save your inputs by clicking the button "Save short cuts". In order to delete an entry, select it from the list and click the "Delete short cut" button (recycle bin).



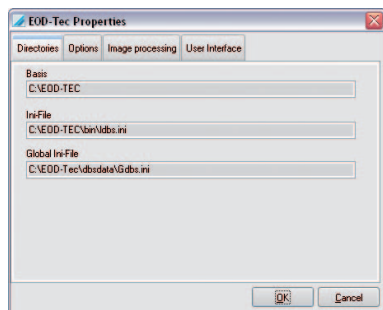
Configuration/modules



Settings for the individual program modules are made under the tab "Modules".

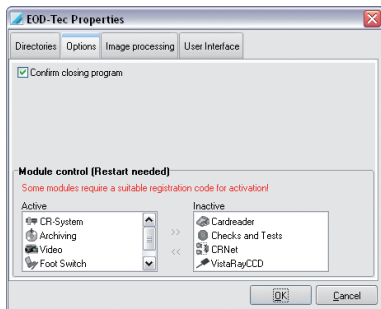
Module EOD-Tec (main module)

Directories tab



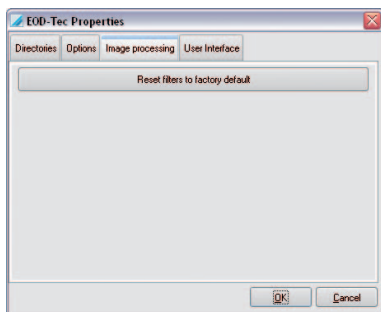
Displays the program directories and position of the initialising files LDBS.INI and GDBS.INI.

Options tab



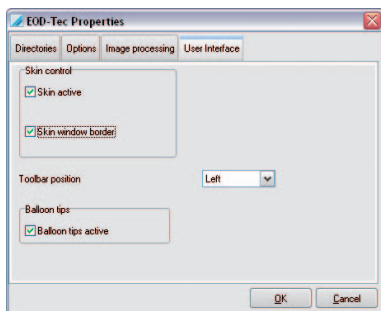
If the check box "Confirm program end" is activated, you will be asked again on quitting EOD-Tec whether you really wish to quit the program. The module control allows you to activate or deactivate modules. Select the desired module and click the button "Activate module" (double-arrow to the right) or "Deactivate module" (double-arrow to the left). If a change is made, a restart of EOD-Tec is necessary!

Image processing tab



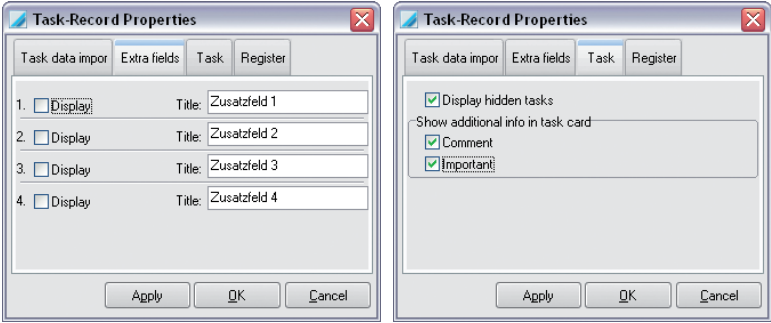
The settings of the image processing filters are reset to the factory settings. Current settings can be replaced.

Skin tab

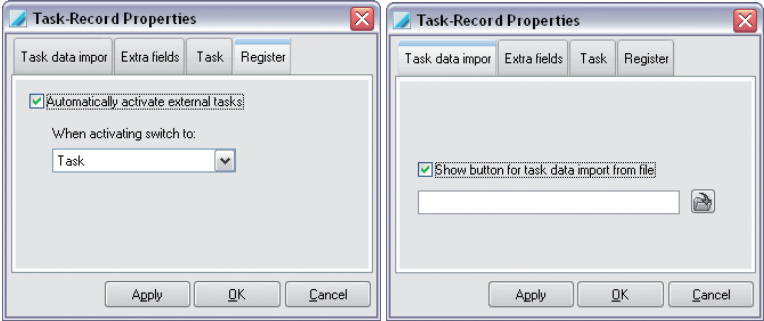


The two check marks under "Skin control" must not be removed. Under "Position of the function bar" you can set where the function bar is to be positioned. If the check box "Balloon tips active" is activated, tips are displayed at the mouse pointer when the mouse is pointed at a button.

Module "Project" (project tab)



Under the tab "Extra fields" (Fig. left) you can select which or how many additional fields are to be displayed in the project tab and can edit their designations. Under the tab "Project" you can select whether projects marked as hidden in the database are to be displayed again in the project search list.

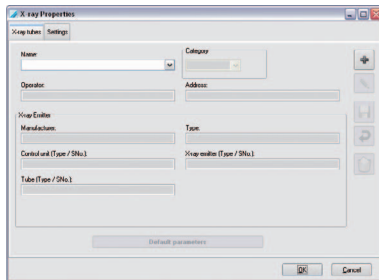


The automatic program change on activation of a project can be set in a selectable module under the tab "Login". If you wish, for example, to jump immediately to the module "X-ray" when logging in a project via an external program, then select "X-ray" and activate the check box "Automatically activate external projects". A login selection list is generated when several projects are handed over by an external program and the check box "Automatically activate external projects" is not activated. The list is then displayed under the project tab during the project import.

Under the tab "Project data import" you can activate the display of the button "Project data import" under the project tab. You can specify a file that is to be automatically loaded when the button is clicked.

X-ray module

X-ray tubes



- "Name": Designation of the X-ray stations, list
"Manufacturer": Name of the manufacturer of the X-ray appliance
"Type": Name, type, serial number of the X-ray appliance or the source
"Category": Category of the X-ray appliance
"Owner" / "Address": Name and address of the owner

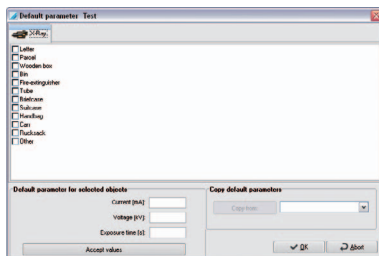
All mandatory fields must be completed. The parameters for different X-ray sources can be set under the tab "X-ray stations". By clicking on the button "Edit name or default parameter" you can set the name and the parameters of the current X-ray system. Clicking on the button "Create new X-ray station" you can create a new X-ray system to be stored in DBSWIN. The contents of the "Manufacturer", "Type", "Owner" and "Address" fields are automatically adopted in the forms of the checks.



For measurement purposes (length and angle measurement) in X-ray images, the image must be calibrated using a reference image object! The accuracy will depend greatly on the distortion of the projection onto the particular image viewer surface.

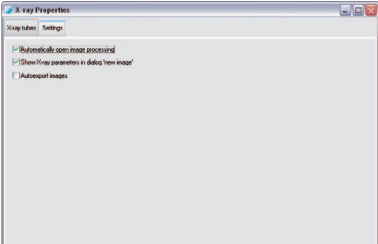
The parameter input is the same for both procedures described above. Select the category and then click on the button "Input parameters" to start the parameter input.

Standard values



In the section "Input values", enter the input values for current, voltage and exposure time and then click the button "Save value(s)" so that the values are saved. If you have installed several X-ray systems, you can take over the values of other systems by clicking on in section Copy Default parameters. Click with the left mouse key on the button in section "Save input values". If available, select an item from the list and confirm with a left click.

Settings



"Automatically open image processing" check box

If the check box "Automatically open image processing" is checked, the image processing box will be opened with the corresponding X-ray image standard functions immediately after an X-ray exposure.

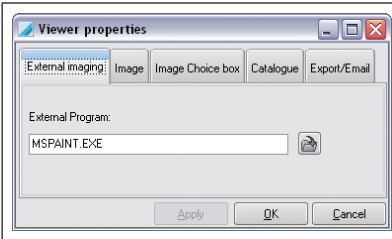
Check box "Display X-ray data in the mask New image"

If this check box is checked, the X-ray parameters are displayed in the parameter mask of the X-ray modules and can be edited.

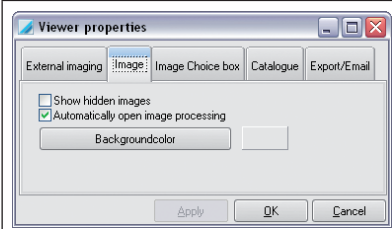
"Automatically export images" check box

If this check box has been selected, any saved images will automatically be exported additionally to the X-ray module. The export format for X-ray images and the export path is defined by the mode "Autoexport" that can be configured in the module Light table/Export e-mail/Export options.

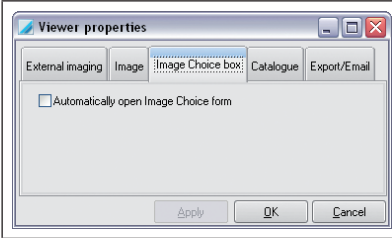
Viewer module (light table)



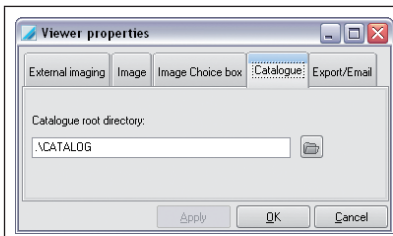
You can enter your preferred processing software for your images under the tab "External image processing".



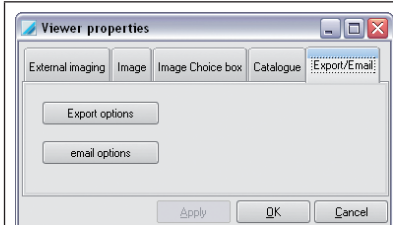
Under the tab "Image" you can select whether images marked in the database as hidden are to be displayed. The background colour of the light table can be selected.



Under the tab "Image selection box" you can set whether the image selection box is to be opened automatically on activation of the light table.



Under the tab "Catalogue" you can select the path for the EOD-Tec image catalogue. The catalogue is available for the storage and subsequent calling up of a selection of example images which may be stored in a variety of addresses. The images can be loaded to the light table with the menu item "Light table/Load/Catalogue". Images on the light table can be saved to the catalogue with the Export function.

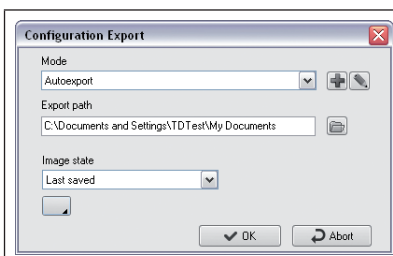


The export or sending of an image by e-mail can be configured under the tab "Export/e-mail".

Export options

The settings for Export and e-mail will be assigned the appropriate mode name. The mode name should therefore reflect the function as well as possible, for example:

"AutoExport" Settings are used for the autoexport of X-ray and video images. This mode name is predefined and cannot be changed!



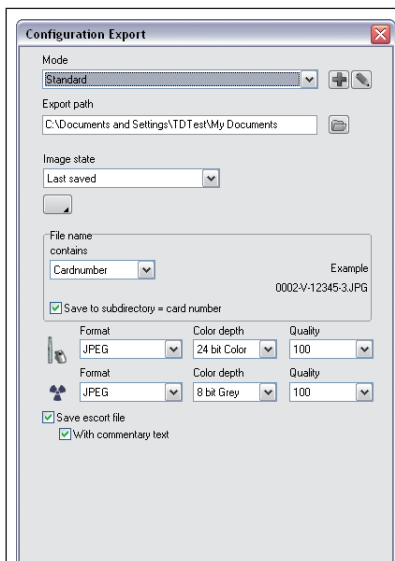
Create new mode



Edit mode



Further functions can be displayed using this symbol or can be hidden. This is possible only for users with administrator status!



images

Selection of the export path to which the images are to be saved.
Not available with e-mail.

"Image status": Status of the image to be exported



Display/hide extended options

"To subdirectory ...": Images are saved to the export path subdirectory = Order number.



Set format, depth of colour and quality of the compressed image formats

"Save image info file": The image info file is saved to the image with the image file name+ -info.txt in the export path (Xnnnn-nnnnnn.JPG-info.txt).

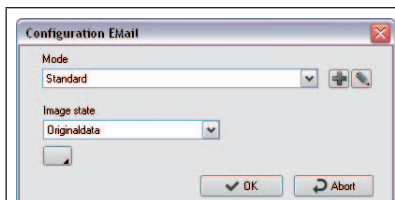
"With comment text": Image comment texts are written to the image info file.

For video and X-ray images it is possible to select an image format from a list. Depending on the format it is possible to select the colour intensity and the quality of compressed images.

A "rule-of-thumb" for the quality of image which is available after compression of the image file:

- 100 – Original data
- 90 – Practically negligible losses
- 80 – Minor visible losses
- 70 – Visible losses

E-mail options (e-mail configuration mask)



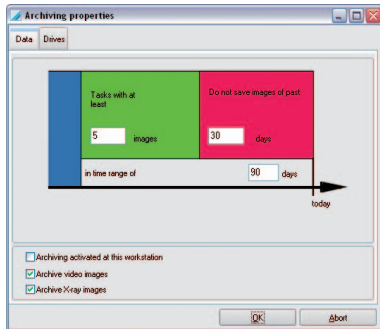
The Export path field is no longer available under e-mail configuration.

Should the image be too large to send by e-mail, cut out the relevant image detail with the Crop function and then send this detail. Check your IT directives for the largest image size that can be sent by e-mail.



Do not send large image files by e-mail! If any problems are encountered, select a larger compression ratio. Lossy X-ray images must not be used for evaluation in Germany!

Archiving module



There are two tab sheets: It consists essentially of two tabs: The tab "Data" for setting the archiving parameters, and the tab "Drives" with the parameters of the archiving drives. These settings are default values used by the Archiving module.

Archiving parameters

Check box "Archiving at this station"

You can define whether archiving will be allowed at this workstation. For security reasons it is recommended to enable archiving only at one station! For performance reasons the archive drive should be located at this workstation. Transfer back is possible at all stations.

Check box "Archive video images"

Determine here whether you want to take video images into the long term archive.

Check box "Archive X-ray images"

Determine here whether you want to take X-ray images into the long term archive



The images to be taken in consideration for archiving are defined as follows :

- All images within the blue time period are always selected for archiving.
- Images within the red time period are not selected for archiving.
- Images falling within the green time zone and fulfilling the criterion "Project with at least n images" are selected for archiving.

Examples

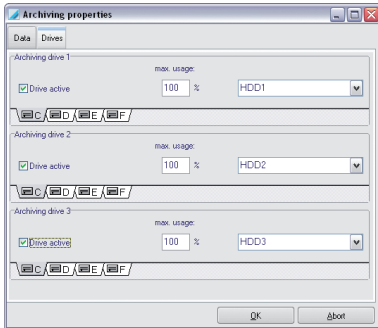
Quarterly long-term archiving of all images:

Grey zone: 90 days
Green zone: 1 image
Red zone: 0 days

If you wish to preferably save only patients with at least 10 and more than 20 days' old images on one medium:

Grey zone: 90 days
Green zone: 10 images
Red zone: 20 days

Archiving drives



The archive module can manage 3 drives at most. These drives must be accessible by assigning drive letters. Before you can make any setting, you must register the drive in the archive module by clicking on the "Drive active" checkbox.



The drives must be filled in ascending order (Drive-1, -2, -3)!

Procedure

- Choose the drive letter for the drive that you want to use for archiving or backing up (e. g. CD-ROM, CD-R). In a network, the drive that is to be used for archiving must be on the server computer.
- Choose the corresponding drive type for your drive in the selection box. Regarding data security a MO-drive type should be used for archiving.
- By filling out field "max. utilisation" you control the maximum percentage of drive capacity that is allowed to be used by the archive module.

Example for drive configuration

"Archiving drive 1": If the write-/read-drive for archiving and reading back the medium that has not yet been closed. In a network, this drive must be installed on a server computers that can be accessed by all EOD-Tec-systems.

"Archiving drive 2" and "3": These can be a global CD-ROM drive on the server, a global CD-ROM Jukebox or a local CD-ROM drive for reading copies of closed archive media. Using a local CD-ROM drive but does not allow fast access to long-term archived image data (without an expensive Jukebox system)!

Module CR Scanner

In this module, the controller for the scanner of EOD-Tec can be configured and tested with the program CRScanConfig.

Further functions available in this program may only be carried out by trained and qualified technicians. The program CRScanConfig offers the following functions:

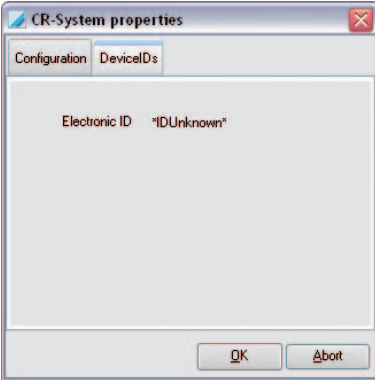
Standard functions

- Check and set the existing interface (connection)
- Read in and display (test) an exposed image plate
- Check ambient light conditions (Oscilloscope mode)

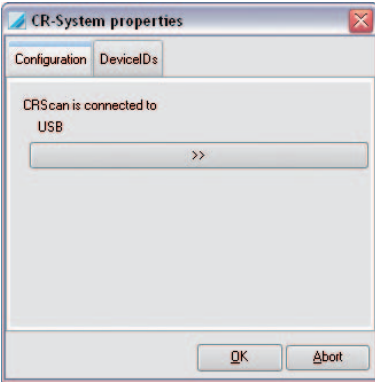
Further functions

- Adapt or expand existing parameter sets
- Carry out test functions of the scanner (System check/Manipulation)
- Create and save available and current test reports (System check/Reports)
- Calibrate

Standard functions



With the scanner connected, register "DeviceIDs" shows the respective Electronic-ID of the scanner.



The USB interface that is used is shown in register "Configuration".

Program CRScanConfig

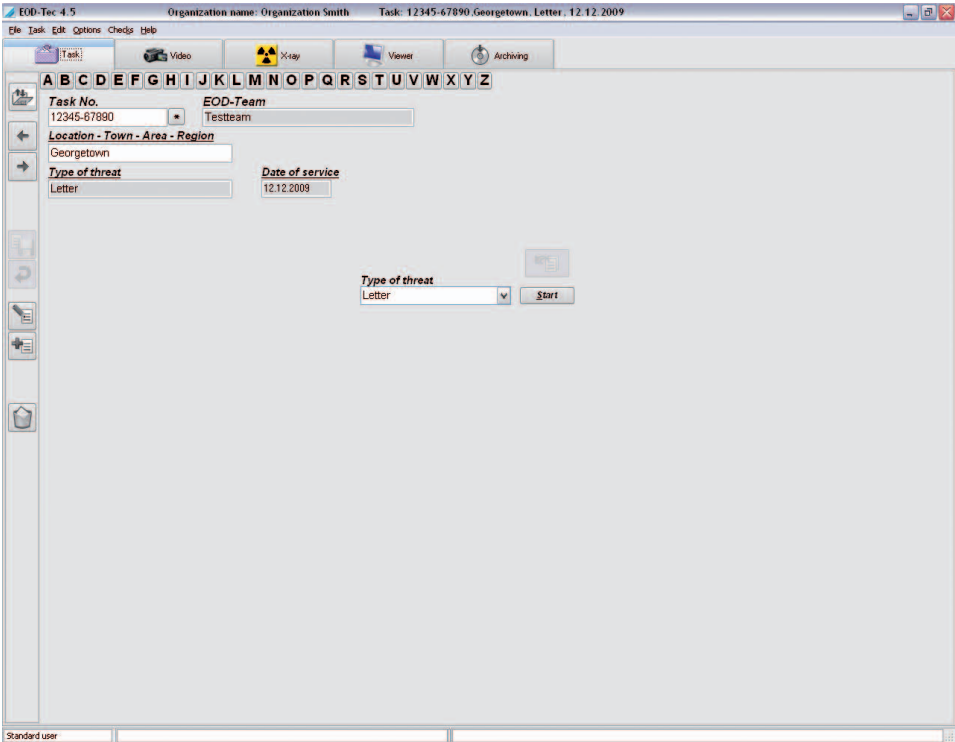
By clicking button "Configure", the program CRScanConfig is called.

3. Project index

General

In the project index, project data can be created, changed, deleted and selected. All project-related data and an overview of the existing recordings are shown on the register sheet.

Project view



Functions



Login/open project (Project menu)

By clicking on the "Project Login/Logout" button, the currently selected project is registered in EOD-Tec and the respective data is shown in the status line.

All functions can not be executed for the selected project (Carry out image recording, View images on the light table). You can then select the previously registered project again by clicking on the project entry in the status line without having to search for the project again. The "Open/Close Project" button then switches to "Log out project" again. If a new project is selected and registered, this new project is shown in the status line. Externally imported projects are always registered!

Logout/close project (Project menu)

The currently registered project and all data fields are cleared.



Switch to previous project



Switch to next project




Save project (Project menu)

Saves the current changes to patient record.



Create new project (Project menu)

Click on button "Create new project", to create a new project. Fill in the data form. You can save the project by actuating button "Save project or changes" . The field "Order number" is a mandatory field. If the mandatory field is not filled out or has been filled out improperly, an information window appears. You can also cancel the entry by clicking the "Cancel entries" button.



Edit project data (Project menu)

By clicking on the button "Edit project data", you can change the project data. Save your changes by clicking on the button "Save project or changes".



Discard changes (Project menu)

Exit edit mode without saving any entries.



Delete project (Project menu)

To delete a project, select it from the database and click on the button "Delete project". The selected project is then deleted from the active database. If images belong to this project in the database, you are notified during the deletion process that you cannot delete the project if there are any X-ray images that must be stored or if archived images exist. In this case, the project is hidden, which means that the project is no longer displayed. The "Display hidden projects" checkbox must be activated in "Configuration/Module/Project" so that you can select a hidden project again. Hidden projects can then be shown in the search list again (and in the "Hidden" column). The attribute "Hidden" is reset as soon as a hidden project is selected. The project can then be seen as normal.

Show and record information (Menu Project/Info...)

You can record or change additional information in the fields "Important" and "Comment|" in editing mode for every project.

Find project

To search for a project in the database, click on the card tab with the start letter for the project.

The 'Task List' window has a title bar with standard Windows controls. Below the title bar is a search bar with a dropdown menu set to 'Task. No.' and a search button with a magnifying glass icon. The search results are displayed in a table with four columns: 'Task. No.', 'Location', 'Threat-Type', and 'Dol'.

Task. No.	Location	Threat-Type	Dol
/ 12345-67890	Georgetown	Letter	12.12.2009

All projects with this start letter are shown in the search window "Project list". You can move through the list to select the desired project. If the list contains several entries, enter more of the name in the "Search text" field. Start the search by clicking the "Search" button. You can select the "Order No." or the "Location" as search criteria in the search field to make it possible to select the project using the number or location that you manage.

You are also able to call up the extended search. Here, you can enter the "City - State/Prov. - Region" as well as the "Type of hazard" to narrow the results of the search.

The 'Task List' window is shown with the 'Extended Search' dropdown menu selected. This reveals additional search criteria fields: 'Location - Town - Area - Region' and 'Type of threat'. The search results table remains the same as in the previous screenshot.

Task. No.	Location	Threat-Type	Dol
/ 12345-67890	Georgetown	Letter	12.12.2009

Start the search by actuating the enter key or by clicking on the "Search" button.

If you click on button "Project search using the job number" (Star icon next to the job number), all projects are shown.

Note: The job number is a maximum 15 place character sequence that is evaluated from left to right! For example: The search character sequence "001T-A0" produces a result list "001T-A0*", whereby * is an optional character.



Import project data

By clicking on this button, you can import the stored project data from a file.



Start recording from project (Quickstart)

By clicking on the button "Start", you can start a recording directly from the project mask. The display changes to page "X-ray" and the preview window appears.

4. Light table

General

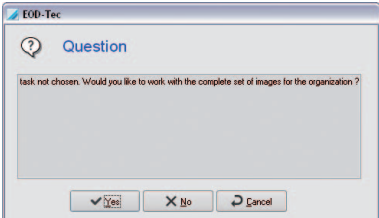
The light table allows free arrangement of images selected. You have the possibility to choose between a preset order, to arrange images as required, to move, to enlarge and to process them.

Global Image Search

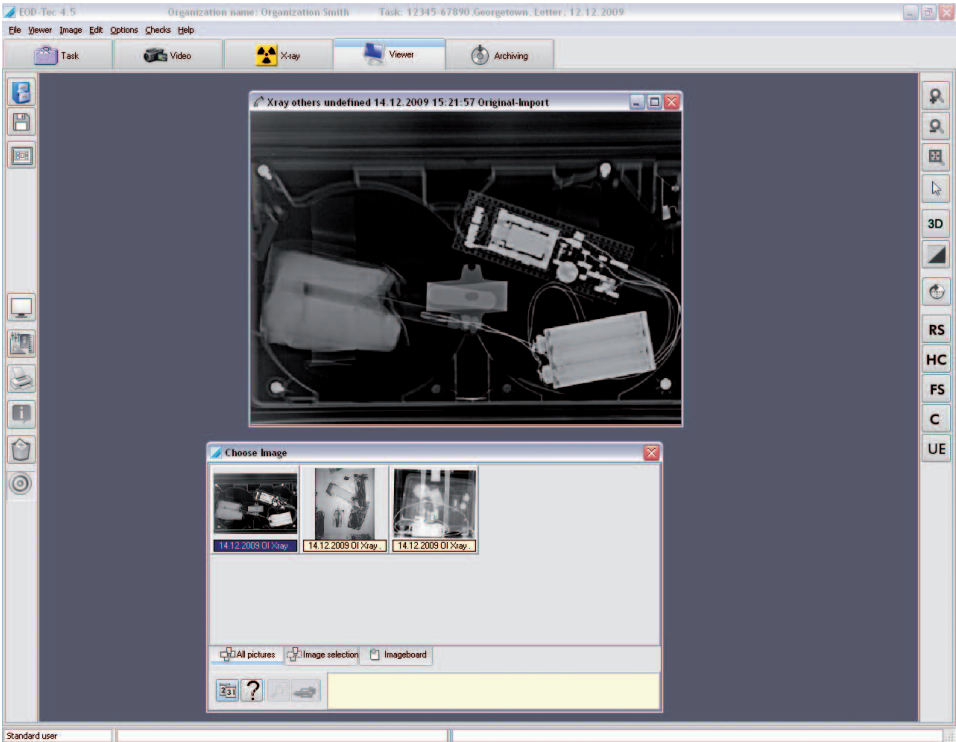
If no project is selected when switching from the project module to the light table, then you can also work with all image data. With a search for certain images for instance.



The process can take a while if all images of the organisation are shown in the image selection box.



View



Functions



Load an image (Light table menu)

To load an image from the database onto the light table, click the "Open image selection box" button. The image selection box appears.

If you double click with the left mouse key on an image in the image selection box, it is opened in full size on the light table. You now have the possibility of loading several images side-by-side onto the light table. Click on the desired image in the image selection box and Drag&Drop the image onto the light table. The image selection box disappears and you can drop the image in any position on the light table in "Free mode". In "fixed mode" you can drop the image only in an existing image frame. If no empty image frames are open on the light table, load a mask first. After putting the image in place, the image selection box appears again and you can open more images. Images can only be opened once. This is shown by the image information line which has a coloured background.



Store image (Image menu)

Stores the active image, or its changes, to the archive.



Gather images on the light table (Menu Light table)

Several partial captures of an object can be combined as a complete image.

By pressing the button, all of the open images with no borders on the light table are opened on a separate light table with a white background. The recorded images can be moved and rotated so that the respective edges overlap to match with one another. This makes it possible to create a large image of a single object from several partial recordings. The newly created layout can then be saved as a new image or as a group.

In this display mode, more buttons appear in the left-hand icon bar:



Optimise image size



Save layout as group



End display mode (View changes to light table again)



Rotate clockwise/counter-clockwise



Zoom in view



Zoom out view

Clear Light Table (Light Table menu)

Clear the light table (all images and frames are removed)

Fixed mode (Light Table menu)

Activate "Fixed mode" by clicking on the option "Fixed mode" in the "Light Table" menu. The image frames cannot be moved in "Fixed mode".

Using drag & drop, images can be moved from one image frame to the other. Move an image from its frame to a new frame that is occupied and release, the two images will switch places.

Freehand Mode (Light Table menu)

Activate free mode by clicking on the option "Fixed mode" again in the "Light Table" menu, which unlocks it. Images can be moved around on the light table in free mode.



Full screen

Shows current image without additional elements as Full Frame Groups

Groups

Individual images of a project can be put into groups to e. g. combine the important image captures for a sitting or sitting sequence.



Save a Group (Menu Light Table)

When the current sequence of images on the light table is to be saved, select from the light table menu the option "Save as Group". You will now be asked to assign a name to the new group. Information concerning the group can be entered in the window below. Then click "Save". A group thus saved, can be loaded or changed and then saved under the same or under a different name. The "Save layout as group" button is only visible if the images are moved together on the light table.

Load a Group (Menu Light Table)

For loading a group, select the option "Masks/Load group" from the light table menu. The load menu with the available groups will be opened and the required group can be selected from the list. Place the mouse pointer over the group names in the list and click the left mouse key and then click "Mask/Group".

Delete a Group (Menu Light Table)

For deleting a group, select from the menu the option "Light table/Delete/Group". The list with the available groups will be opened and the required group can be selected from the list. Place the mouse cursor over the group name in the list and press the left mouse button and then click on "Delete".

Masks

A number of different masks (empty frames) can be organized on the light table simultaneously. Standard image arrangements, for example, can be quickly created in this way without having to sort the images on the light table.



Images which are within the image frames will not be saved! Masks can be used for every project.

Save a Mask (Light Table menu)

To produce a new Mask, arrange the images in the desired sequence on the light table. Select from the light table menu the option "Save as Mask". You will now be asked to assign a name to the new mask. Afterwards click "Save".

When saving, only the image frames without images are saved. If you want to load defined object image recordings automatically when loading the mask in the respective image frame, these image frames must be allocated with object type numbers before saving. You can achieve this by copying a respectively available X-ray image (object type number) and inserting it again. The imported image must now be assigned the required object type by using the Image info function. This procedure must take place for all desired objects. After saving under an appropriate name this layout will be available for the automatic loading of all the newest, matching images.

Load Mask (Light Table menu)

For loading a mask, select from the light table menu the option "Load Mask". The load menu with the available masks will be opened and the required mask can be selected from the list. Place the mouse cursor over the name of the mask to be opened and click the left mouse key, then click "Load".



If you want the mask to automatically select the latest matching images, mark the appropriate option field "Load latest images".

Delete a Mask (Light Table menu)

To delete a mask, select the "Light table/Delete/Mask" option in the menu. A list with the available masks will be opened and the required mask can be selected from the list. Place the mouse cursor over the mask name in the list and push the left mouse button. After that click the delete field.

Load catalogue (Light table menu)

With command "Light table/Load/Catalogue", you can load an external image catalogue from a directory. In a catalogue, you can combine and call up several images in a project.



Image processing (Image menu)

You can edit an activated image by clicking on the "Edit active image" button or by double clicking on the image. Read more on the functions in "Image processing".



Print (Light Table, Image menu)

This option in the light table menu allows an image or number of images on the light table to be printed. For more information, read the manual in chapter "Printing" or in Help.



Image information (Image menu)

To enter, edit or display information on the active image, press the "Image information on active image" button. The image information box appears for the respective image.

You can enter text information on the image in the "Comments" tab. The texts of the hotkeys can be copied to the text area with the right mouse key. The first comment can only be entered once and cannot be changed after saving.

The image type, image size, object type and object range are displayed on tab "Image info". By clicking on button "Selection" in the middle window area "Type", you can select where the image should be allocated and confirm your selection with "OK". In defining the object range, the previously selected main object is displayed with a blue background. All marked objects are displayed in text in the "Range" field.

You are provided with a view of the creation data for the image in the "Creation" tab. In addition, the operator responsible for the image is also listed.

The previously entered values are shown in the "X-ray" tab and can be changed if necessary.

You can find information on the creation, the last change, the file name and the resolution in the "Image status" tab.



Delete an Image (Image menu)

An image can only be deleted if it has not yet been archived in the EOD-Tec long-term archive and is not subject to any legal storage term (e. g. X-ray images)! EOD-Tec queries with each image, whether the image should only be hidden. That means that the image is no longer shown in the image selection box until the field "Display hidden images" is set in "Configuration/Module/Light table". As soon as the image is loaded on the light table, the hidden status is eliminated and it will always be displayed in the image selection box.



Drop Surface

If individual images or several images are moved out of the image selection box by means of Drag&Drop, then the following functions are displayed in a list for selection for the image or images.

- "Export...": Export image(s)
- "e-mail...": Send image(s) by email
- "Image clipboard": Copy image selection box in the image clipboard



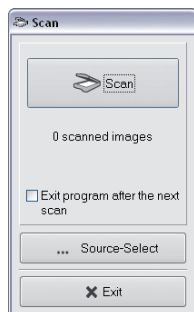
In order to send e-mails an SMAPI Client (e. g. Outlook Express) must be installed !

CB

Scan an image (Menu Light Table)

This menu item enables you to accept images from a TWAIN source (e. g. scanner). After the selection of a menu point, the EOD-Tec scan window opens, in which you can select the TWAIN source and open the image capture. The number of images taken is shown. After closing the EOD-Tec scan window, these images are displayed on the light table.

To put the image in the database, click on "Save active image" (Diskette). You must now assign an image type to the imported file, otherwise the image cannot be saved.



Activate an Image

Single left click activates the respective image. (The colour of the image bar changes to silver.)

Marking Images



Mark image with red checkmark

How to mark an image:

- Individual images: Ctrl. button and mouse click in the image range
- All images: Mouse click in image range, call context menu "Mark/Mark all"

Eliminate the marking for individual images or all images in the same way.

The image to be marked in this way can be in the Image selection box or on the light table. If an image is marked from the light table, then the thumb image in the Image selection box will also be marked and vice versa. Several images can be marked at once.

An image or all images marked in the Image Selection Box or on the light table can then be saved, saved as a group, deleted, exported, sent as e-mail or copied to the image store in the Image Selection Box.

The functions for marked images ("Save", "Save as group", "Delete", "Export", "Send mail" and "Image store") are available via the following menus:

- Ctrl button + Drag&Drop
- Context menu/"All marked"
- Main menu/"Light table/All marked"

Image processing functions (right icon bar)

The most important image processing functions of the toolbox are also shown separately on the right-hand icon bar for fast access.. More information can be found in chapter "Image processing".



Zoom in view



Zoom out view



Call up magnifier (Zoom window)



Select standard mouse pointer



Emboss image



Invert grey-/colour-values



Rotate image by 270°



Increase contrast medium-sized structures



Greatly increase contrast medium-sized structures



Greatly increase contrast fine structures



Increase contrast fine structures



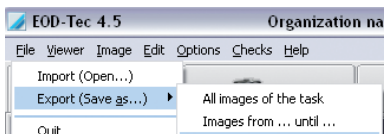
Compensate for underexposure

Import (File menu)

This menu function allows images to be imported. After the selection of this menu point, a load window opens, in which the respective image file can be selected. Then click the "Open" menu. The image is now depicted on the light table and can be processed. To put the image in the database, click on the "Save active image" button. You must now assign an image type to the imported file, otherwise the image cannot be saved.

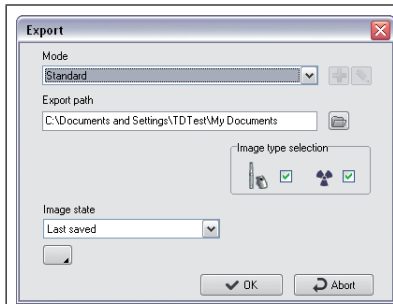
Export (File menu)

This function allows images in various formats to be exported, e.g. to process these further or to make them available to others.



You can either confirm an available export mode (setting under "Configuration/Modules/Light Table") from the list and select or confirm the directory where it is to be sent. If you want to use a different mode than that proposed in the predefined Image status for export, this can be selected from the list of options under Image status. Detailed information concerning the image formats can be found under "Configuration/Modules/Light table/Export-e-mail." Further selection criteria are partly explained in the following section.

Export functions



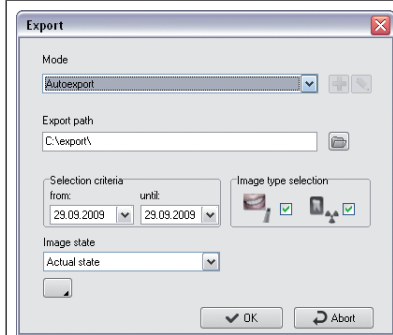
All images of the project

"Image type selection": Selection for video-/X-ray images

"Image status": Image status of the exported image

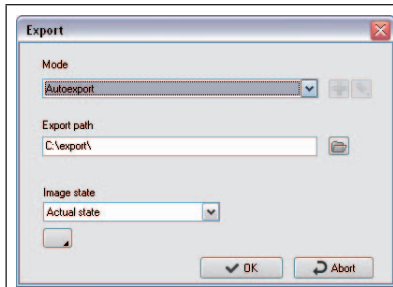


: Activate extended function view!
Only visible for users with administrator rights



Images from ... to ...

"Selection criteria": Selection of the period of the images to be exported



Selected image on viewer

– Only the active image (blue image bar) is exported.

Marked images on the light table

– All images marked with a red checkmark are exported (Ctrl + Left click).

The system administrator has the possibility of amending all the parameters for current image export using the further options menu point.

Any changes made to the current mode will not be stored. This can only be done under "Configuration/Modules/Light table/Export-e-mail"!

Image status

The five different image states "Original", "First save", "Diagnosis", "Last saved" and "Current status" can be exported.

All visible coloured graphic elements presented in the image on the light table will be added to the exported image (burned-in)!

The image process box supports the following four levels of drawing, whose graphic elements can either be visibly presented singly (control box On) or all together (control box All) or be set as non-visible:



Angle measurements



Length measurements of lines and polygons






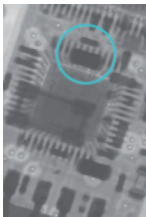
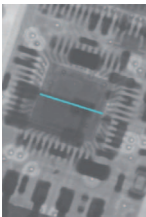
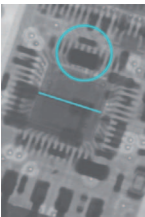

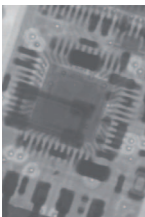
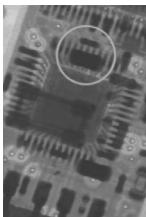
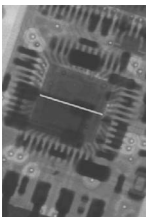
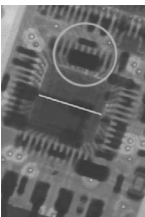


Text, line and closed line elements

Examples of images exported under varying image status

Not visible = drawing level is not visible or no graphic element is present

Not possible = image status does not support drawing level

Display	Original status	Initial storage	Evaluation	Last stored image	Current status
	Not possible	Not visible	Not visible	Not visible	Not visible
	Not possible	Not visible	Not visible	Not visible	Visible
	Not possible	Not visible	Visible	Not visible	Visible
Light table image					
export. Image					

Duplicate an Image (Image menu)

Creates a duplicate of the active image on the light table.

Assign an Image (Image menu)

Open the project list to allocate an image to another project located in the project base. Archived images can no longer be reassigned!

Sort Images (Menu Light Table)

Automatic sorting of all images which are on the light table at the moment.

Imaging (Menu Light Table)

The active image is transferred to an external image editing program as a call-up parameter. The external image editing program available must be entered in "Configuration/Modules /Light Table/Imaging. After ending the imaging program, the changed image is displayed on the light table and can be stored as a duplicate!



Image selection box

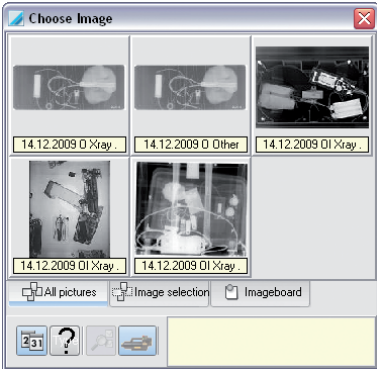
You can vary the size of the image selection box by dragging the box at the borders, edges or separation line of the image section. The size of the comment area can be adjusted by dragging the upper border of the comment field with the mouse (mouse pointer changes from arrow to double arrow). These settings will be stored till the next change.

The Image Selection Box can be brought up to date under Contextmenu/Update (right hand click). This means that those images which may have been taken at other stations in the meantime are also displayed. The image selection box is displayed by pressing the "Open image selection box" button. The Image selection box enables you to choose the required image from those saved for displaying on the light table.

Example – One line

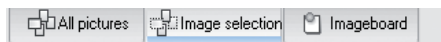


Example – Two line



Display Bar

Here, you can switch between the display of all images, a selection of images and the images in the image clipboard.



The image clipboard serves to store selected images temporarily. If images are sent to the light table (e. g. from project-, video- or X-ray module), then they are stored in the image clipboard as copies. This allows immediate access to the images. It is also possible to copy a particular image from the image selection box or from the light table onto the image clipboard. The current content is deleted as soon as new images are copied into the image clipboard.

The pushbutton "Image board" is inactive when it contains no images.

The button for image group "X-ray" and the number of images are shown under buttons "All images", "Image selection" and "Image clipboard". By clicking on the buttons, the images of the group are shown in the image selection box.



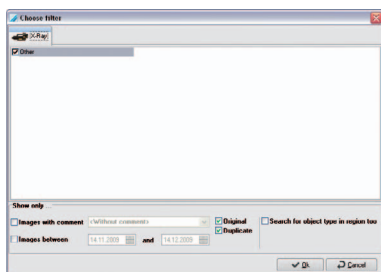
Sorting of images by date/object type

The images can be sorted in the image selection box according to date of creation or to object type. Within the sorting according to object type images are also sorted according to date of creation. You can display particular images only by using a filter on the stored images. This is especially useful if many images are created for a project.



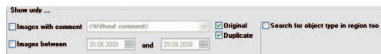
Advanced image selection filter

After actuating the button "Filter selection (detailed image search)", the expanded filter selection box is shown for all image types.



The available recordings are displayed in the list plan. You can select these with a click. You can make separated selections so that only the desired images from the existing recordings are shown in the image selection box.

Additional selection criteria for filtering the display of images can be entered and activated for all types of image.



6. X-ray

General

In connection with the X-ray imaging system CRScan, X-ray images can be digitalised and saved. Every X-ray image is allocated to the currently selected project. All X-ray images are saved as original data and are no longer changed by EOD-Tec. If X-ray images are edited with the image processing functions, this does not affect the original image. Information is simply added and can be undone any time as desired. If you have allocated an X-ray image to the wrong project, it is possible to assign it to the correct project. This can be carried out at the following two places:

In the X-ray module, before saving with menu point "2nd image/Save under another project"

In the light table under the "Reassign image" menu item. In the original image, this action is documented with the entry of the data for the operating project and the initial project.

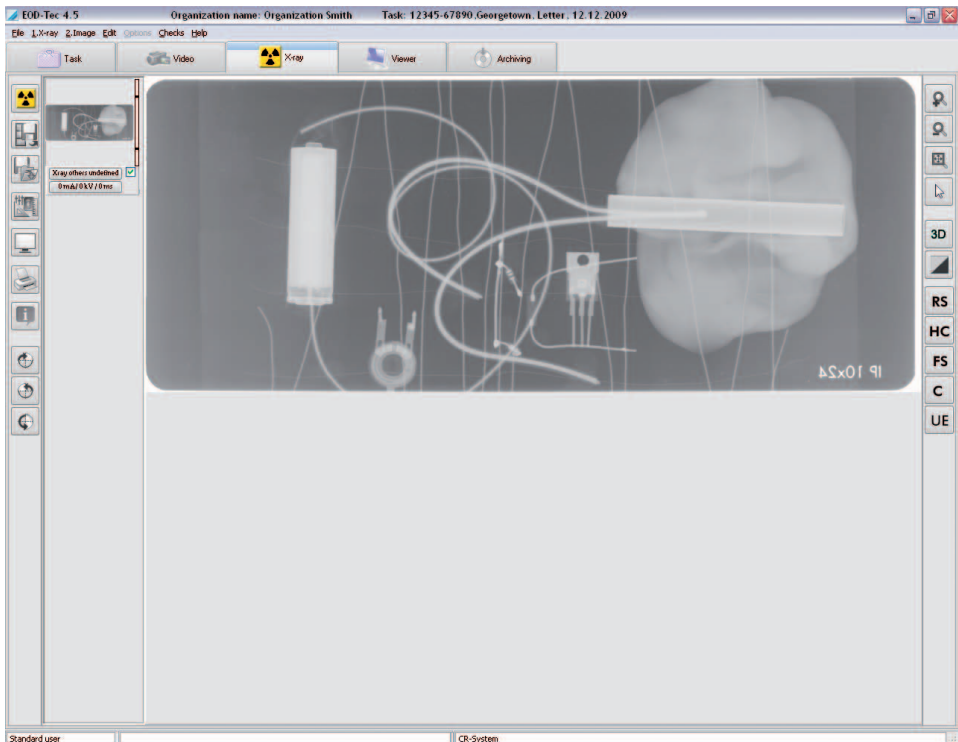
Measurement of X-ray images

Utilising the processing module, X-ray images that have been recorded with a recording device (image plate, CR scan, X-ray scanner), can only be measured after calibrating using a defined object (e. g. metal ball, metal pin). The measurement precision in this case, depends heavily on the positioning of the image plate (relative to the object and source of radiation). Please go to chapter "Image processing" and read the warning information on length- and angle-measurements.

Data backups

As a general rule, you should back up your data regularly. If the X-ray module is used (e. g. CRScan), a regular backup of the EOD-Tec database file directory "..\dbsdata" is absolutely imperative! Please read the "Data Backup" section in the "Further Information" chapter.

View



Functions



Take X-ray image (X-ray menu)

Taking an X-ray image is initialised by clicking the "Take a new X-ray image" pushbutton".

X-ray image configuration

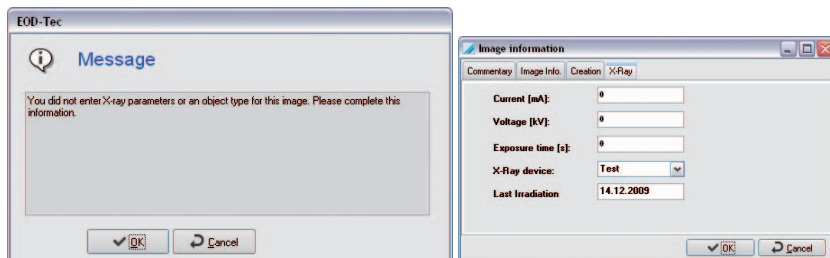
Before an X-ray exposure can be performed, the "Record image" dialogue window appears, in which the recording parameters can be entered or selected.

The standard recording mode for the selected X-ray imaging is displayed and can be changed (standard mode can be defined in "Configuration/Module/CR scanner").

An image object can be selected before or after the recording. In the left-hand lower corner of the window, the recording system is shown (red marking).

Compulsory entry of X-ray recording parameters

If the marking field "X-ray parameters are mandatory" is marked under "Configuration/Organisation" in section "X-ray", at least the X-ray dose parameter must be defined (mA, kV, ms). At the latest when saving the entry you will be prompted to enter these once more (figure below on left) if these parameter fields contain no data (figure below on right). X-ray parameters can only be changed after saving the image, if the marking field "X-ray parameters can always be changed" is marked under "Configuration/Organisation" in section X-ray images!



Entry of X-ray dose parameters

EOD-Tec suggests the exposure parameters, if a saved image exists for the selected object with the currently set X-ray device. If this is the case, the existing values are used as the parameters. Otherwise, EOD-Tec takes the standard settings for the selected X-ray device that is defined under "Configuration/Module/X-ray" for the object. If you use different recording values for the X-ray device, these are to be entered manually.

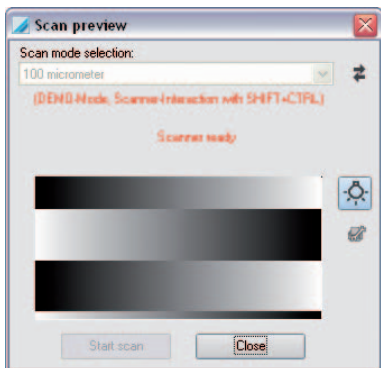
The standard setting of established X-ray parameters can be set for each X-ray device and every object type under "Configuration/Module/X-ray". Please note that these standard settings can only be modified by users with the required access authorisation (administrator)!

Read an image

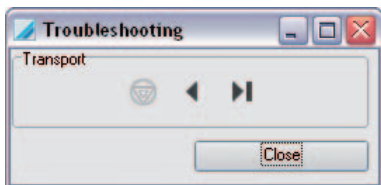
After entering the X-ray parameters, click on the "Read" button and a recording window appears.

CRScan recording window

CRScan goes to recording readiness (LEDs illuminated in green), if the button "Start scan" is activated. As soon as image plates are read in the CRScan, this window shows the current line information and the image flow through CRScan in the recording window. Providing this window is not closed, further image plates can be fed into the system.



If problems (e. g. image plate not transported all the way out) occur during or after scanning, the scanning process can be ended and called up with the button "Error recovery" (Open-end spanner icon) for dialogue "Problem solving". Here, you can control the film transport.



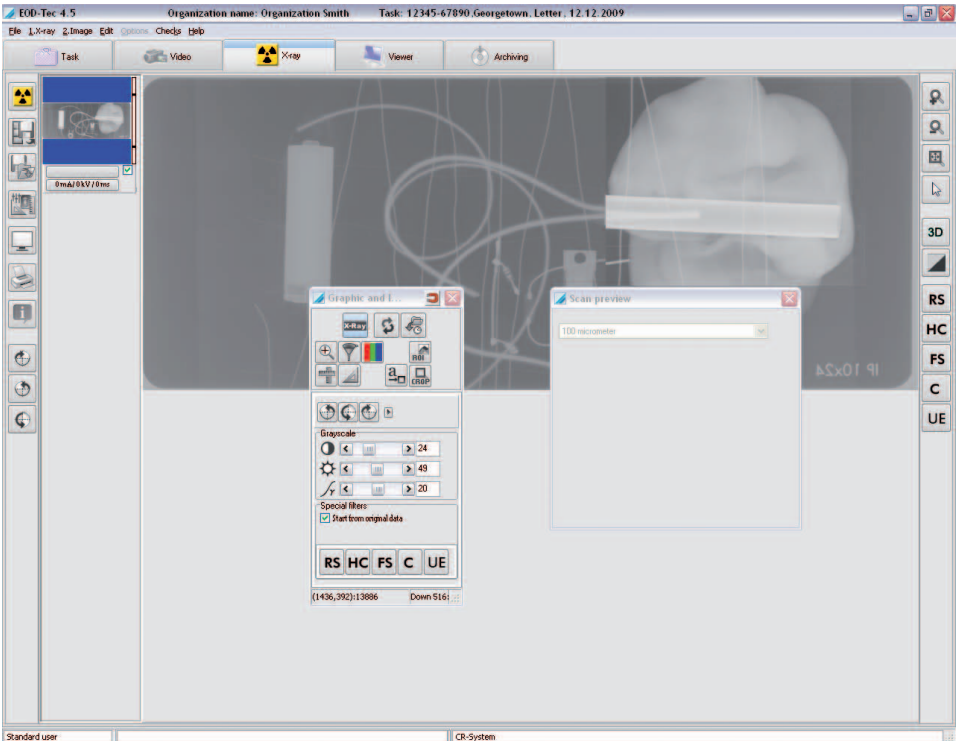
Using button "Switch delete function on or off", you can switch the delete function on the scanner on/off.

Message "Light exposure too high"

Avoid direct exposure to halogen lights and sunlight.

Check lighting conditions (≤ 1000 Lux) at the input area of the scanner and reduce light in the close-up range if necessary.

While the recording window is displayed, all X-ray images that are recorded are shown in the image strip on the left.



The image that is taken last (blue background in the image strip) is shown large in the right-hand window and can be analysed with the image processing functions. By clicking on another image in the image strip, the active image can be changed. All images stored in the image strip also show a colour bar to the right: this displays the Dose Equivalent Value of the image. This value serves only as a guideline for the optimal setting of the dose parameters (only possible if there is no extreme overexposure or underexposure). A good setting is displayed with a green bar, a critical setting with a red bar. There is a lower and an upper critical limit (slash in the bar), as of which the bar colour is red.

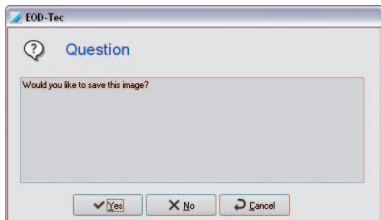
Procedure in the event of a red bar:

- Bar red and low: Increase X-ray dosage or amplification in recording system
- Bar red and high: Decrease X-ray dosage or amplification in recording system



Save images (X-ray menu)

If you click on this button, all images that are selected and assigned to an object type are stored in the database. Before you save images for the currently selected project, you should make sure that the object type is allocated correctly. If you discard an image, you must first remove the marking and answer the question on the following displayed dialogue with "NO".



Save and open on the light table (X-ray menu)

If you click on this button, all images that are selected and assigned to an object type are stored and transferred to the light table for further processing. There they appear in the image clipboard of the image selection box and can be put on the light table using drag&drop. Before you save images for the currently selected project, you should make sure that the object type is allocated correctly.



Image processing (Image menu)

You can process the active image by activating the processing box. To do this, press the "Image processing" button, double click in the image area or click with the right mouse button within the image to open the context menu and select "Image Processing". The exact descriptions of the functions are available in the manual or in the online Help in chapter "Image processing".



Full screen

You can also display the image in the main window in full screen mode by clicking on the "Full screen display" button. Switching to normal view is done with a right click with the Full frame context selection or with the ESC button.



Print (Print menu)

Click on the "Print" button to prepare the image for printing. Read more on the subject in the manual or in the online help in chapter "Printing".



Image information (Image menu)

To enter, edit or display information on the active image, press the "Image information on current image" button. This displays the image information box for the current image.

You can enter text information on the image in the "Comments" tab. The texts of the hotkeys can be copied to the text area with the right mouse key. The first comment can only be entered once and cannot be changed after saving.

The image type, image size, object type and object range are displayed on tab "Image info". By clicking on button "Selection" in the middle window area "Type", you can select where the image should be allocated and confirm your selection with "OK". In defining the object range, the previously selected main object is displayed with a blue background. All marked objects are shown in text in the field "Range", whereby combined objects are displayed within a rectangle between the start and end object for the range.

You are provided with a view of the creation data for the image in the "Creation" tab. In addition, the operator responsible for the image is also listed.

The previously entered values are shown in the "X-ray" tab and can be changed if necessary.



Rotate 90° clockwise

The active image is rotated by 90° to the right (clockwise).



Rotate 90° counterclockwise

The active image is rotated by 90° to the left (counterclockwise).



Rotate 180°

The active image is rotated by 180° to the left (counterclockwise).

Image activation (X-ray menu)

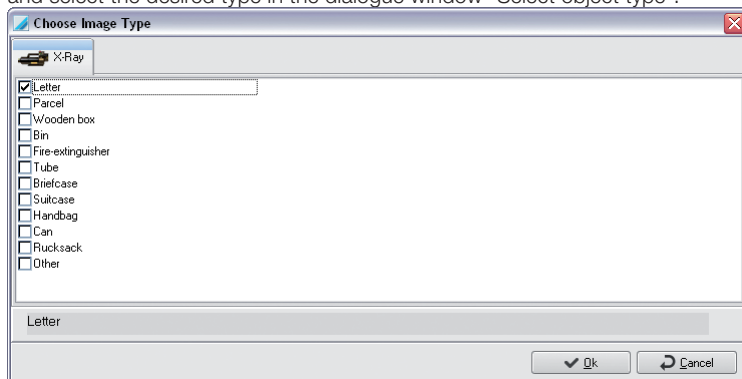
Click on an image in the image strip to display it in the main window. You can activate the previous image if you activate menu sub-point "Previous image" in menu "X-ray".

Mark image to be stored

There is a check box below the bottom border of the images which are displayed in the image strip. Clicking on this box allows the image to be selected or deselected for storing purposes. Only images that are checked are saved or transferred to the light table.

Assigning images

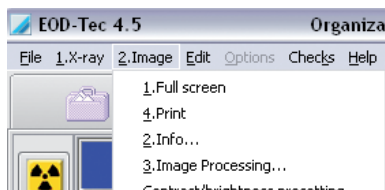
The images in the image bar can be assigned the X-ray image type, the object type, the X-ray parameter and other image information. Undefined object types should be assigned to X-ray-UNDEF! To define the object type, click on the button in the lower border of the desired image in the image strip and select the desired type in the dialogue window "Select object type".



You can also click on button "Info" and define the image type via button "Selection" in the dialogue window "Image information". The X-ray parameters and other image information can either be entered by clicking on the button in the lower border of the desired image in the image strip or with the "Info" button.

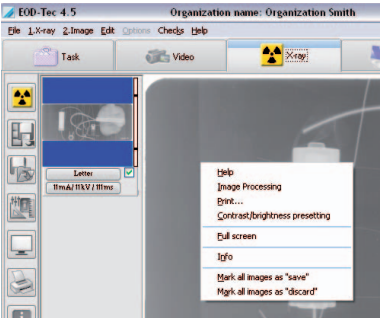
Assigning an image to another project (Image menu)

If an image is not to be assigned to an active project, you can assign the active image to a project that can be selected from the project list via the menu bar under "Save 2nd image/under another project".



Defining brightness and contrast values new image captures with CRScan

The image processing box must be closed! After right clicking in the image area, you can activate the respective window in the context menu with menu point "Brightness/Contrast default definitions".



The changes to brightness-, contrast and gamma values are shown directly in the current image and can be saved for newly captured images of the same CRScan mode or for all modes of the same type.

Contrast/brightn...

Settings for
Image source:
Image category:
100 micrometer

Settings of current image

Brightness: 45
Contrast: 50
Gamma: 20

Accept values for current mode
Accept values for all Unknown modes
Abort

"Settings of current image": Set desired brightness, contrast and gamma values.

: Reset brightness, contrast and gamma values.

"Accept values for current mode": Save current setting values for the currently selected CRScan mode

"Accept values for all unknown modes": Save current setting values for all modes

Image processing functions (right icon bar)

The most important image processing functions of the toolbox are also shown separately on the right-hand icon bar for fast access.. More information can be found in chapter "Image processing".



Zoom in view



Zoom out view



Call up magnifier (Zoom window)



Select standard mouse pointer



Emboss image



Invert grey-/colour-values



Rotate image by 270°



Increase contrast medium-sized structures



Greatly increase contrast medium-sized structures



Greatly increase contrast fine structures



Increase contrast fine structures



Compensate for underexposure

What to do after a PC crash

If the computer crashes while you are in the X-ray program module during or after an X-ray recording, the images recorded are not lost!

When restarting EOD-Tec, a message appears that provides general information indicating that image data still exists in the X-ray imaging system or temporarily on the hard drive, which has not yet been stored finally in the EOD-Tec database.

After selecting the program part "X-ray", a dialogue is displayed that informs you that there are still one or more images of a project that have not been stored in the database. This dialogue is only displayed if the image that was found also belongs to the currently defined organisation. The program instructs you to select the corresponding project so that the images can be read in.

7. Image processing

General

The Image Processing function allows the operator to control and amend the image parameters. There is also the possibility to add elements to the original image. These are then stored with the image, but can later be removed if necessary.

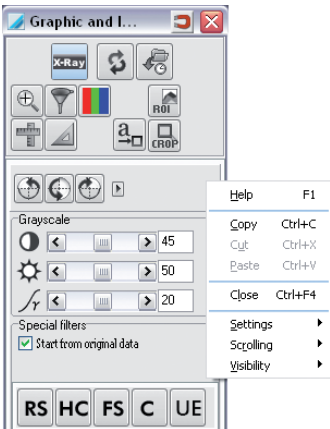
Graphic- and Image-Processing

The image processing is performed with dialogue window "Graphic and Image Processing". Many important functions can also be accessed directly via button in the right-hand function bar. The dialogue window for image processing can be adapted in the start-up image.

Click on the "Process active image" button or on the "Image processing" entry in the "Image" menu. The dialog window appears.

Context menu

Right-click on the dialogue window to open a context menu.



Unfold

The dialogue window can be folded up partially or completely if not being used.

Right click on the dialogue window.

Select "Unfold".

Three options can be selected here:

"Always open": The toolbox is not folded up.

"Half open": The additional functions are folded up.

"Fully closed": All functions are folded up.

Visibility

The dialogue window can be made transparent over the background with option "Transparency". To have the function active, the option "Half open" must be selected in menu "Unfold".

Right click on the dialogue window.

Select "Visibility".

Four levels can be selected here:

100 %, 75 %, 50 %, 25 %

Depending on the selected level, the dialogue window is shown with transparency.

Note: The "Transparency" function only works in conjunction with the "Unfold" function. If the "Always open" option is selected in "Unfold", the "Transparency" function is automatically deactivated.

Overview of Functions



Function area with image processing functions

In the upper area of the image editing box, clicking on the appropriate symbol allows you to select either one of the global functions or one of the function groups.

In the upper area of the image editing box are shown the individual editing functions according to the function or function group selected.



Undo/restore last image processing function

Click the pushbutton "Undo/repeat last image operation" to revoke the last image processing function or to restore it by clicking again.



Load image status

By clicking on button "Load image status" ("Main menu/Image" or "Image context menu"), select entry "Load image status". One of the currently available image statuses can be selected from the list and can be displayed on the screen.

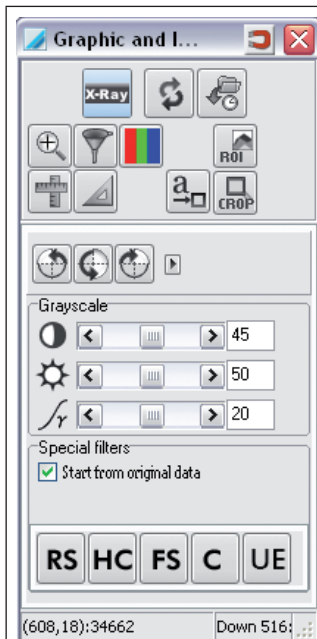
An image can have one of the following four statuses:

- Last save: Image at last save process
- Evaluation status: Image when saving the initial comment (Diagnosis etc.) in the image info box
- First save: Image at initial save after the image creation in the X-ray module. If no image processing function (Rotate, brightness, contrast stretching etc.) was used on the original image, this image status corresponds with the original image.
- Original image: Image after the image capture




X-ray image – main functions

All the principal functions for image editing of X-ray images are displayed in the functional area. Further functions can be selected where necessary.



The settings for individual images can be altered using the sliding bars (brightness, contrast, gamma) as required.

Alternatively, you can change the brightness (horizontal mouse movement) and contrast (vertical mouse movement) intuitively in the active image (mouse icon in the

image area: ) with the left mouse key pressed.

Evaluation support

The evaluation support is performed with the original data if the marking field "From original data" is set. In all other cases the filter is selected matching the current type.

Structures or objects in the image that are significant to the respective evaluation can be highlighted (contrast amplified) without decreasing the image sharpness. These interesting structures are seen at a glance within the image displayed.

The use of the following filter is limited to images up to a maximum size of 50 MBytes. To filter areas of larger images, the respective area can first be cut out using the crop function and then the cut-out area can be filtered.

By using the following filter, an optical change of the displayed edges is possible.

The following filters are also accessed directly via button in the right-hand function bar.

Regular Structure



Contrast of medium-sized structures is increased.

High Contrast



Contrast of medium-sized structures is greatly increased.

Fine Structures



Contrast of finer structures is greatly increased.

Custom-made



Contrast of finer structures is increased.

Underexposed



Compensates for underexposure.



Image rotating & mirroring

In addition, the mirroring functions are hidden and shown with the button

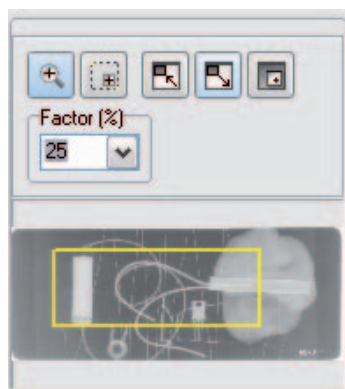


Depending on which of the symbols has been selected, starting with the current image, the image will be rotated 90°, 180° or 270°.

The last rotation or mirroring can be revoked/repeated when clicking the pushbutton "Undo/repeat last image operation" (main functions).



Zoom Tools



The zoom tools allow you to view the complete image or, alternatively, a section of the image either enlarged or reduced in size.



: To display the image with a magnification factor, please press on the magnifier. Clicking the left mouse key within the image enlarges it, clicking the right mouse key reduces it.

"Factor": Alternatively, you can enter or select percentages in the list field.



: Using function "Draw rectangle", you can draw a rectangle, displayed in the preview window as a yellow frame. You can move the yellow frame in the preview image with the mouse. In the image frame, this selected part can be displayed larger.



: With the function "Set image window size to image size", the frame is adapted for the magnified image.



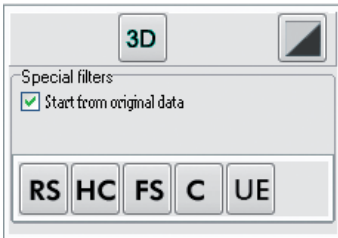
: With the function "Adapt image to window size", the image is adapted to the frame size.



: With the function "Magnifier (local zoom window)", you are provided with a magnifying window on your image, which you can magnify and move as you wish. The zoom factor is selected using the sliding scale at the side of the screen.



Filter Functions



The filter functions can be selected by clicking the relevant active filter function symbol. Filter operations can be revoked/repeated by clicking the pushbutton "Undo/repeat last image operation" (main functions). To get back to the original image, please press the "Load image status" button in the upper selection bar. The original image can be restored after saving by clicking the "Load image status" button.

Drawing levels

The image process box supports the following four levels of drawing, whose graphic elements can either be visibly presented singly (control box "On") or all together (control box "All") or be set as non-visible:



Angle measurements



Length measurements of lines and polygons



Text, line and closed line elements



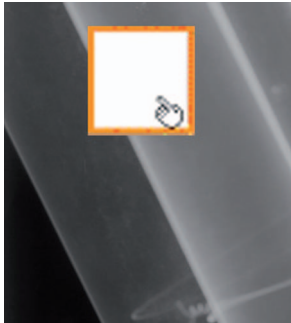
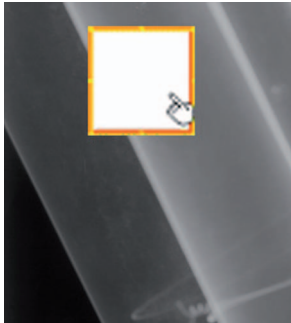
CROP tool (cut-out of image parts)

Create graphic elements

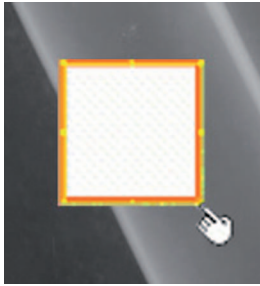


In order to create a new graphic element, select the elements required and click the appropriate symbol. Define the start position of the element by clicking with the left mouse key on the desired image area. Now, you can change the size and alignment of your element by moving the mouse. It is locked with a single click of the left mouse key.

After any creation the last used graphic element is always the active one. This is displayed by a dotted line surrounding the element and a hand as cursor. You can now change the parameters of the elements, for example colour, size, layout and background colour.

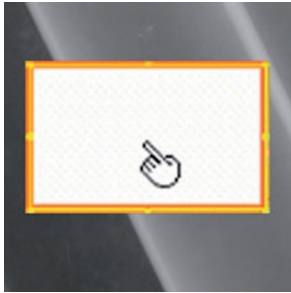
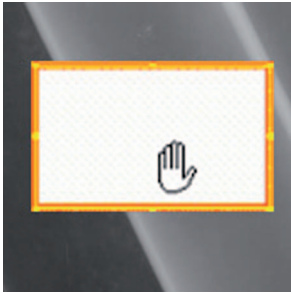
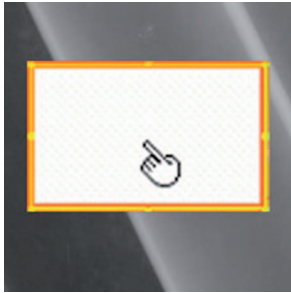
Activate graphic elements

1. Left click on element with pointer finger mouse pointer. Holding down the Ctrl key allows other graphic elements to be activated.	2. Marking frame with drawing points of active element is visible
	


Alter graphic element size

1. Set pointer finger tip of the mouse pointer on a drawing point of the active element + Left click	2. Double arrow mouse pointer appears. Determine element size with mouse movement + Left click to end.	3. Link select mouse pointer (finger symbol) appears again.
		



Move graphic element






1. Left click on element with pointer finger mouse pointer	2. Hand mouse pointer appears. Move element with mouse movement + Left click to end.	3. Link select mouse pointer (finger symbol) appears again.
		





Common functions at drawing level

 <p>Graphic overlay</p> <p>Icons: Delete, Undo, Redo, On (checked), All (checked)</p>	<p>"Delete...": Deletes active graphic elements</p> <p>"Undo delete": Undoes the delete of active graphic elements</p> <p>"Delete graphic": Deletes all graphic elements</p> <p>"On" check box: Make current drawing level visible or invisible</p> <p>"All" check box: Make all drawing levels visible or invisible</p>
--	--

Text, line and closed line elements







 <p>Graphic overlay</p> <p>Background</p> <p>Pen</p>	 : Create closed line element <p>"Pen": Pen colour can be set; Pen thickness can be set via list field</p> <p>"Background": Colour of background pattern can be set; Background pattern can be set</p>
---	--

 <p>Graphic overlay</p> <p>Background</p> <p>Text</p> <p>Example</p> <p>Example text</p> <p>Text attributes: B, U, 9, colour, size</p>	<p> : Create text element</p> <p>"Background":</p> <p> : Text background pattern filled</p> <p> : Colour of filled text background</p> <p> : Text background pattern transparent</p> <p>"Text": Text can be input or changed</p> <p>Text attributes: bold, underlined, colour, size</p>
---	--

 <p>Graphic overlay</p>  <p>Pen</p> 	 : Create line elements
--	--



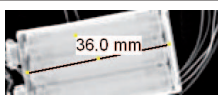
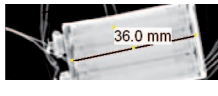
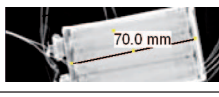
Length measurements of lines and polygons

<p>Line</p>  <p>Graphic overlay</p>  <p>Pen</p>  <p>Length</p> <p>0 mm</p> <p>Calibration length</p> <p>0 mm</p> <p>10.0 Pixel / mm</p>	<p>"Line":</p>  : Create simple line  : Create polygonal line <p>"Length": Define actual length of path and unit: pixels, cm, mm, inches Attention: A calibration must always be carried out for cm, mm or inch! "Calibration length": Select or enter calibration length in the field.</p>  : Accept calibration length Attention: For unit = Pixels not possible!
---	---



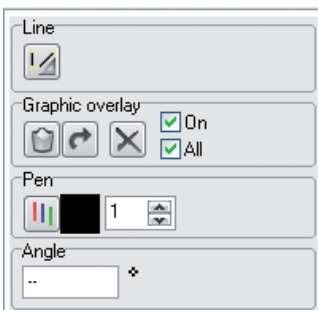
In order to estimate lengths and angle in X-ray images, the image must be calibrated using a reference object. Despite calibration, this estimation does not indicate the accuracy of a measurement and must not be used as the measured result. The accuracy will depend greatly on the distortion of the projection onto the particular image viewer surface. In video images, no estimation of lengths and angles can be done to scale!

Calibration with an object of known size as reference object

	<p>Length: 36.0 mm</p> <p>Calibration length: 36.0 mm</p> <p>2.8 Pixel / mm</p>	<p>Measure the defined reference object distance e. g. Unit = select mm and enter path.</p>
	<p>Length: 36.0 mm</p> <p>Calibration length: 70.0 mm</p> <p>2.8 Pixel / mm</p>	<p>The calibration length must be selected! Set calibration length = 70.0 mm. Accept calibration length by clicking the button "Use selected line for length calibration".</p>
	<p>Length: 70.0 mm</p> <p>Calibration length: 70.0 mm</p> <p>1.5 Pixel / mm</p>	<p>All future measurements will be based on this calibration. This calibration can be repeated at any time!</p>



Angle measurements



"Line": Create an angle
"Angle": Included angle is displayed
(in example: "85°")

Create side 1

Left click.

Drag route from A to B in the direction of the apex with the mouse.

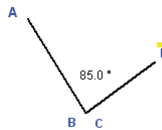
End side 1 in point B with left click.

Create side 2

Left click in point C.

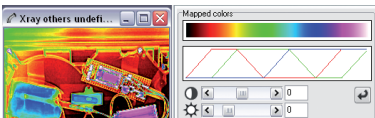
Drag the mouse from point C to point D.

End side 2 in point D with left click.



Pseudo coloured image

You can set the pseudo colour using the sliders. The pseudo coloured image will not be stored! The basic colours can be selected individually to get your optimum of colour transitions by clicking on the stripe base colours within the colour you want to be replaced by another colour. The Windows colour selection box appears where you can select the new colour. The available colours are shown in the stripe mapped colours which can be extended using the sliders.

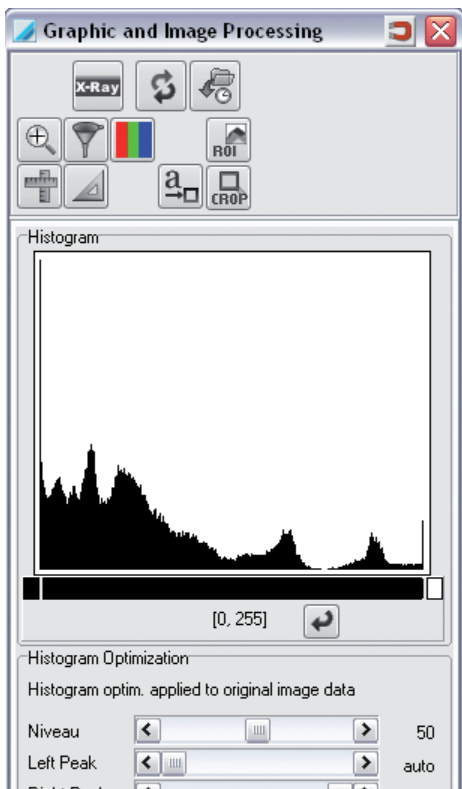


With button "Set Standard", the base colours and the slide controller are reset to the standard values.

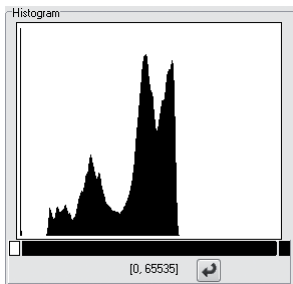


ROI Histogram

This function sets the grey scale distribution of the image. Among other things, it enables stretching the existing intensity values over the entire area. This way, differences in intensity that are too small to perceive with the human eye are intensified so that they can be detected.



16-bit grey scale images



16-bit grey scale images from CrScan: Low dosage = 0; High dosage = 65535

Histogram stretching

The histogram is shown in the upper area. Here you can perform a histogram stretch. The display is changed to grey scale during the process.



Optimally extended original images cannot be extended any further!

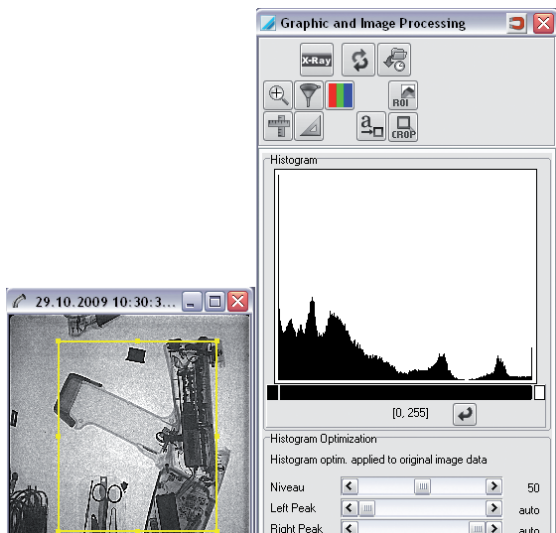
Procedure

Click on the black bar under the histogram and define the length with the left mouse key pressed.
or:

If you only want to view a certain image area (ROI = "region of interest"):

Draw a frame in the image.

The contrast stretching area is then set with a minimum and maximum grey value within the drawn frame.



If you move the frame, the contrast stretching range is adapted automatically.

The levels of grey in the area of the black bar are always displayed at 256 grey levels for display on the monitor.

By pressing the "Set Standard" button



the entire grey scale range is shown (bar extends across the entire area).

Histogram optimisation

In the lower area, you can perform a histogram optimisation. During the optimisation, the histogram of the image is changed ("Histogram equalisation"). The optimisation is defined using the slider control.

"Level": This slider control defines the height at which the peaks are cut off in the histogram.

"Left Peak"/inner: The setting of the slider control corresponds ideally with the grey value of the

"Right Peak": Edge of the two peaks at the edge of the histogram. If both controls are not moved, the area is calculated automatically. The display on the right, next to the controller then shows "auto". If you move one of the two slider controls, this value is used instead of the calculated grey value.

"Weight Sqrt. ": This slider control setting defines the weight (from 0 % to 100 %) of consideration of the root curve in the information of the histogram.

Procedure

1st Step: (with slider control "Level")

Reduce the contrast of the grey value range that corresponds with the peaks of the histogram curve, compared with a standard histogram equalisation.

2nd Step: (with slider control "Left Peak" and "Right Peak")

Suppress peaks on the left and right edges of the histogram. These peaks correspond with the image border or the object background. In addition, the contrast area in the grey value range is decreased outside the value defined by the slider control.

3rd Step: (with slider control "Weight Sqrt.")

Average histogram.

8. Print

Setting up a printer



Before you begin setting up a printer in EOD-Tec, a printer should already be installed under the Windows operating system. More information for setting up a printer under Windows is located in the Windows Online Help or in the Windows manual. Setting up a printer under EOD-Tec must be done at each workstation!

The dialogs or menu items described below can be activated if there is at least one image on the light table.

Calling up the Print dialog window

You have the following options to activate the Print dialog:

Open it via the menu bar under "Image/ Print" or "Light Table/ Print".

Click on the "Print" button.

A context menu appears with the selection "Image" or "Complete light table".

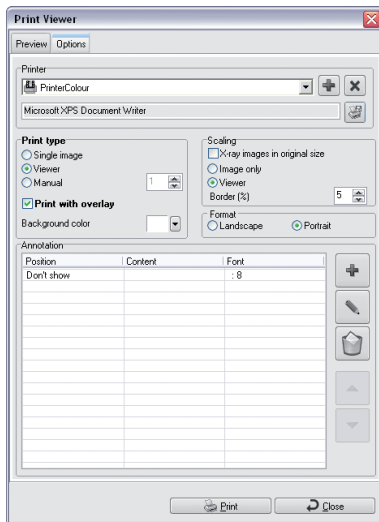
Image...

Complete viewer...

Select a menu point.

The "Print single image" or "Print light table" dialog window appears. Choose between "Single image" or "Light table" if necessary.

With activated dialogue window "Print": Click on the folder "Options", so that further settings can be made.



Printer / : Create new printer profile

- Click on button "Create new print profile".
- Click into the text field and name the new profile.
- Configure all settings as described from "Select printer profile".

"Printer" list field: Select printer profile

Click on the pull-down button and select the desired profile.



: Select printer

Click on the printer button and select the desired printer.

Print type: Select print type

Single image:

The marked image is printed.

Light table:

All images on the light table are printed.

Images per line:

When activating the button "Images per line", the images for printing are sorted in lines and columns.

Print with overlay:

If a checkmark is set with "Print with drawings", drawings that were inserted with the toolbox are also printed.

Frame / Background colour:

Choose any colour for the image background.

Scale: Select output range and scale

X-ray images in original size:

If a checkmark is set with "X-ray images in original size", the images are printed in original size.

Light table:

The button "Light table" scales the print-out of the entire light table to a full page.

Image only:

In activating the marking field "Image only", the smallest possible frame is determined to surround all images and the printout is scaled to a page.

Border (%):

The setting "Border (%)" determines, with which border width (relative to the image size) to surround an image. This has an effect the print of several images, as it also defines the margin between the individual images.

Format": Select format

Select portrait or landscape format.

Annotation: Select information

In this selection field, the images for printing can be automatically supplemented with information, e. g. Project name, Job number, etc.

- Click on button "New Annotation".
- Under "Position" select where the information is to appear.
- Under "Character set", select font, font style and font size.
- In the pull-down menu of the "Content" field, select the information that is to be supplemented. Multiple definitions possible.
- Confirm with "OK".

"Preview" tab

Select the "Preview" tab to check the pre-settings.



Depending on the used printer model, printer setting (e. g. Fast-print mode at reduced quality) and paper grade can cause the quality of the printout to be very different. These factors also influence the reproduction of details and number of grey levels. If printouts of X-ray images are to be used for diagnostic purposes, it is necessary to determine whether the print quality is sufficient by printing out a grey scale test image (EOD-Tec\GREYTEST).

9. Image archive

General

Unlike the backup function, which is designed to helping you to restore the last backup level (working status) in the event of a total system failure, the purpose of the archive module is to build a long-term archive of the video and X-ray images and to permit direct access (random access) to the images archived. On the one hand, such a long-term archive reduces the storage requirements on the working partition while, on the other hand, it fulfils the legal requirements regarding the obligation to preserve X-ray images for a specified period.



A long-term archive should be created on a separate data storage medium (e. g. MO-drive, CD burner). If you set up a long-term archive on a work partition, on which the operating system and other user programs are installed, there is a danger of there not being sufficient storage area for the operating system and any other possible programs. This may result in problems during program execution.

Immediately before or after an archiving process, a backup of the database directory "..\db\data" must be performed so that all data can be restored consistently after an irreversible drive crash!

Suitable archiving drives and storage media

Based on the present state-of-the-art engineering, a magneto-optical drive, abbreviated MO drive, is to be recommended for long-term archiving. The manufacturer should guarantee data readability for up to 30 years. The access times to files are also reasonable. CD recorders are less suitable since the manufacturers can only guarantee a max. medium readability period of 10 years. Moreover, the life of a CD greatly depends on ambient conditions. Note that only CD burners that can be accessed with special driver software (e. g. Adaptec Direct-CD > V2.0) can be used as a file system. The storage medium must be formatted before using.



While hard disk drives are a possible storage medium, they should only be used in cases of emergency or for testing since they are not suitable for long-term archiving! Tape drives are unsuitable for long-term archiving since they do not support direct access to data.



When archiving security-relevant X-ray images (e. g. in nuclear power plants), the X-ray images must be recopied after the shelf-life of the media specified by the manufacturer has elapsed.

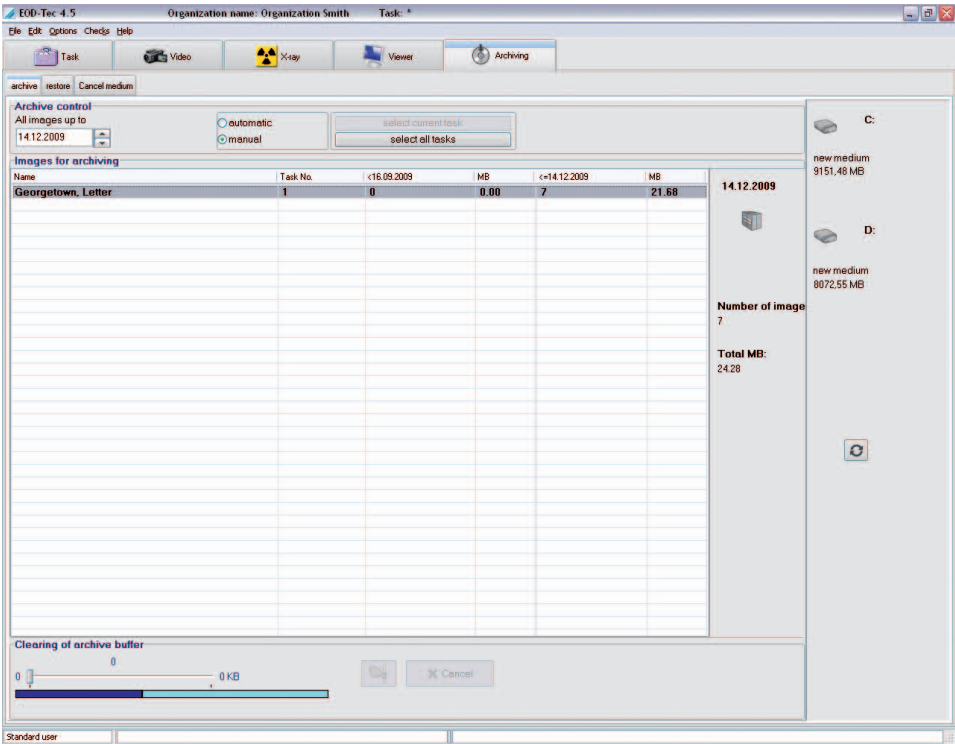
Archive management

The archive module tab contains the tabs "archiving", "restoring" and "delete medium". The field "Archive control" is located underneath. It contains the entry field "All images to", archiving mode "automatic" and "manual" and the button "Select current project" and "Select all projects".



Before starting an archive procedure, the archiving system must be configured properly ("Menu/Configuration/Module/Archiving").

Archiving



"Images for archiving": Image list with project numbers and other information



Archive packet with date information, number of images and size



Archive drive (example) with available size

Automatic creation of the archive image list

As long as you are in automatic mode, the buttons "Select current project" and "Select all projects" are blocked and in the date filed "All images to", the date limit is displayed as the set value between the green and red area of the configuration setting. This is the mode of operation that should generally be used.

In the above described automatic mode, the program determines the images to be archived using the configuration setting. You can however change the time period in the area "Archiving control" with date field "All images to" for this archiving process.





Every date change must be confirmed with the button "Date OK?" so that the image list is updated.

Under this field is the image list "Images for archiving". This image list shows all the images that match the selection criteria. If at least one image to be archived is displayed, the archive module creates a package in the first field on the right. Click on this packet and Drag&Drop it on the desired archiving drive shown in the right-hand field. If no archive disk drive is present, then this must be configured under "Configuration/Module/Archive/Drive".

Manual creation of the archive image list

The manual and automatic archiving procedures in the procedures only differ in that you define the project images to be archived yourself, from the list. Only select this operating mode if you want to do project-oriented archive!

Here, you are provided with the two buttons "Select current project" and "Select all projects". If the button "Select current project" is deselected, you have either not selected a project (Project module) or there are no images that can be archived for the current time period.

Procedure

- You can select the projects as usual in the Explorer, also using the mouse, the Shift or Ctrl buttons or with the buttons already indicated.
- If you have selected at least one project, the respective images are tied into an archive packet, which you, as already indicated, Drag&Drop onto the desired archive drive.
- Other procedures are the same as automatic archiving.

Closing of archive media

The program automatically closes each medium if the medium becomes full after or during an archival storage. If you want to close the medium in advance (e. g. a copy should be made), select the respective medium closing from the context menu. Display the context menu by clicking on the medium symbol in the drive display area with the right mouse button.



Once a medium has been closed, it can no longer be used for archiving!

Labelling of archive media

Always label a new medium immediately after the first successful archival storage with the archiving number displayed below the medium in the field to the right. The first 6 numbers (from the left) are unique and should be recorded.

Copying of archive media

The archive medium to be copied must be closed to guarantee data consistency! Copies should be made for protection against data loss (due to mechanical destruction or disappearance of the original medium).

Archives disk drives

The second field contains the drive icons for the existing archive drives and information on their current status:

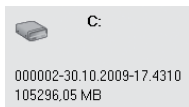
- | | |
|-----------------------|---|
| Closed: | Each medium on which at least one archive has been stored can be closed. If this is the case, click on it with the right mouse button to open a context menu which enables you to obtain additional information on the drive or to close the drive. Closed means that you cannot perform any further archiving procedures on this medium. |
| Outside organisation: | An EOD-Tec archive data storage medium, the archive of which does not belong to the current organisation was inserted. |



No write access!

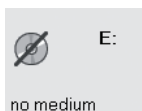
The currently inserted storage medium does not permit write access. Any data already present on one of the archive medium can be read!

In the case of an MO disk or similar storage medium, this means that the write protection function has been activated. A recordable CD has been closed using the file system, or a CD-ROM drive has been configured.



Indication of media ID and free storage capacity on this medium

This medium may be used as the first one for the next archival storage. Should the capacity remaining be insufficient to hold all the data to be archived, you will need additional media to continue the archival storage. The number of media required is estimated before the archiving operation starts. The number of media indicated is the maximum number of media needed; this number will never be exceeded.



No medium

If an archiving drive does not contain a medium (e.g. no CD in CD-ROM drive), this is indicated by a thick diagonal line.



Refresh drives

A double-click on this field updates the drive display (e. g. after changing medium).

Archive buffer

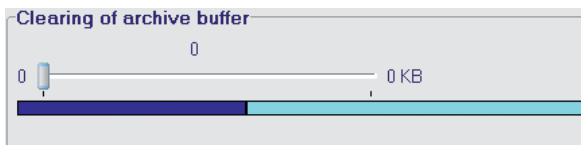
Long-term archiving is based on a two-phase procedure. In the first stage, the images are copied to the archive medium and are then left in a normal image directory (these images are referred to as archive buffer to follow), from which they can be loaded into EOD-Tec at any time.

To do this, move the slide control to the right to determine the size of the storage space to be cleared. Click on the "Delete" button to close the process.

The coloured bar shows the current storage allocation of the drive on which the organisation data is stored.

This bar consists of three sections identified by different colours:

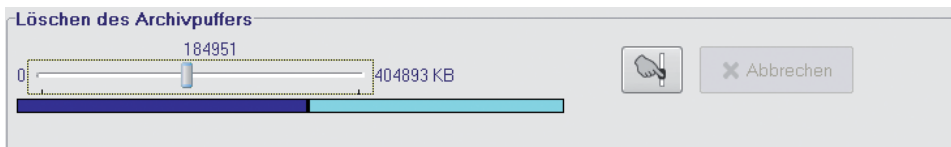
- Blue = unusable hard disk space
- Olive green = storage space occupied by archive buffer
- Green = usable hard disk space



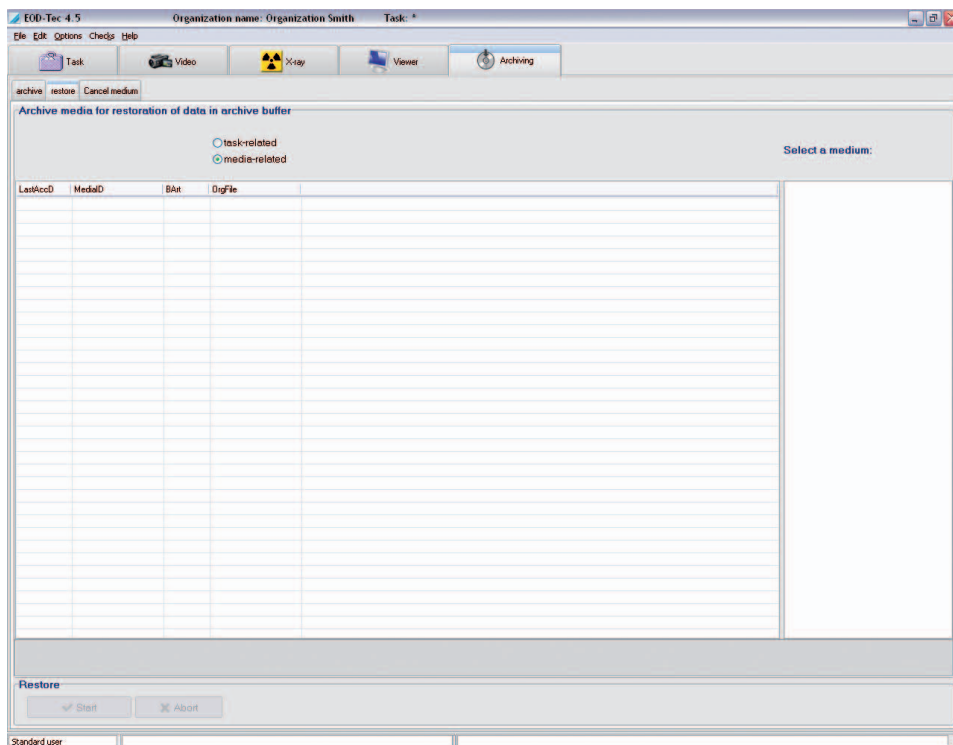


You should only delete these images in the archive buffer if you absolutely require memory on the drive (e. g. for new image captures).

In the following example, the slide control was moved to the right to clear 184951 Kbytes of the 404893 Kbyte archive buffer. This storage space is released (cleared) by clicking the "delete" button.



Restore of archived images



You are able to restore medium-based or project-based. If a medium restore is to be performed, the archive module searches all drives configured for archive media. When restoring by project, all archive media that belong to the currently selected project are shown in the field "Select a medium" next to the list field and can be selected there. As limitation, up to which day the images are to be restored can be entered via the date field. Once a medium has been selected, all matching images are displayed. The recording date, medium ID, image type and file name are shown for each image. After you have selected a medium, you can then restore all of the images shown in the list back into the archive buffer with the "Start" button.



The project-based restore is always a good idea if you are preparing the next organisation days. This always guarantees that all required images are always available on the drive and do not have to be tediously read during a sitting from archives on one or more media!

Cancellation of archive medium



Use this function only in case of loss of or damage to an archive medium or for a migration to larger storage media!

Only the image data of the archive medium still found in the archive buffer can be archived again after the cancellation. A cancelled archive medium must always be deleted before it can be used for archiving again. All registered archive media are displayed for selection. After selection you can see if there are images already deleted in the archive buffer. These images will be lost if the archive medium is totally damaged or lost. If the archive medium is only partially defective, you must restore as much data as possible (Function: Restore archive) before you cancel it.

All data must be restored for a migration to new archive media. (Attention: There must be sufficient drive space for images.) You must check that all the images are available before cancelling the medium. After that all the data can be archived on the new archive medium.

Dürr NDT GmbH & Co. KG

Höpfigheimer Straße 22 · D-74321 Bietigheim-Bissingen

Tel: +49 7142/99381-0 · Fax: +49 7142/99381-299

info@duerr-ndt.de · www.duerr-ndt.de

