

DICOMReader

USER MANUAL

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0 REVISION HISTORY

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1 CE CONFORMANCE STATEMENT

IMAGE Information Systems Ltd. does not accept liability for the wrong or unprofessional use of the described software (see the End User License Agreement).

DICOMReader is certified as a medical device according to Council Directive 93/42/EEC concerning medical devices.



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All patient names used in this manual are completely fictitious.

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We assume no responsibility for information and description as far as third-party products are concerned.

We are dedicated to improving and enhancing this software. Consequently, the information in this manual is subject to change without notice. Current information about product improvements can be received from the DICOMReader homepage <http://www.dicomreader.com> or IMAGE Information Systems homepage www.image-systems.biz.

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2 INTRODUCTION

The DICOMReader is a software tool that scans any removable data carrier (e.g. CD/DVD or USB) inserted into your computer automatically for images.

All contained files will be checked; DICOM images will be analyzed and converted if necessary. Afterwards, valid DICOM images will be transmitted via DICOM STORE to your viewer or PACS.

The DICOMReader allows parallel processing (multi-threading) of multiple media at a time as well as adaptation of external data to your local range of patient IDs and accession numbers.

The DICOMReader is available in two different versions, which you will find explained in the Administration Guide, chapter 3 "INSTALLATION AND LICENSING". It will run as a **PRO** version for **15 days** after the installation and **15 days** thereafter as a **basic** version. After these 30 days, the application stops working unless a full license is obtained and the software is activated with a specially created activation key.

2.1 System Requirements

DICOMReader Software is running on Intel-compatible computers and runs at least on a Microsoft Windows 2000 Operating System (or higher versions). A network device has to be configured for the usage of the TCP/IP network protocol.

Minimal system requirements are:

- Windows XP
- Pentium III 1 GHz
- minimum 512 MB main memory
- minimum 5 GB hard disk (for program files and the volume of the data to be saved temporarily)

2.2 DICOMReader features

2.2.1 BASIC features

- Easy import of external patient CD/DVD/USB media by:
 - CD/DVD media detection
 - USB media detection
 - Completely automatic media scan or manual scan of directories
- Optimized use of screen display by minimization of the icon to the system tray bar
- Support of lossy and lossless JPEG and JPEG 2000 as well as lossless RLE compressed encoding and fully automatic compression
- Manual assignment of own accession numbers and IDs to read-in exams for reliable retrieval
- Acceleration of the HIS/RIS workflow by:
 - Configuration of an unlimited number of DICOM destinations, also by defining rules
 - Automatic sending of images to a standard destination (automatic creation of accession numbers)
 - Database to store media imports/exports
 - User-defined status monitor

- Enhanced workflow windows:
 - Different modification levels (patient or study level)
 - Possible assignment of same accession number to all studies of a particular patient on a medium
- Comprehensive, configurable log system with flexible password protection(Enhanced logging features for all actions)
- Optional anonymization of DICOM patient data for usage in multi-center studies

2.2.2 Pro features:

- Easy import of external patient CD/DVD media by:
 - Intuitive tree-based selection process of studies, series or images
 - More compatibility by automatic exclusion of defined DICOM objects
- Acceleration of the HIS/RIS workflow by:
 - Assignment of exam and patient data by Worklist and PACS query
 - Automatic matching of patient data between PACS or Modality Worklist server and the data carrier according to demographic data
 - Rule-based automatic modification of DICOM tags
- Verification of demographic data with existing PACS data while reading
- Consistent documentation of all applied changes in DICOM tags
- Legal disclaimer for external data optionally burned onto each image or added as first image of a series

3 INSTALLATION AND LICENSING

For detailed information regarding the installation and licensing / activation of the software, please refer to Chapter 3 of the DICOMReader 4.0 Administration Guide.

Please note that at least the Adobe Acrobat Reader must be installed on the system.

4 CONFIGURATION

For instructions concerning the configuration and setting up of the application as well as hints regarding trouble-shooting problems please refer to the DICOMReader 4.0 Administration Guide.

Please note that at least the Adobe Acrobat Reader must be installed on the system.

The Administration Guide covers, among others, the following topics:

- Installation & Licensing
- Option settings
- FAQ

5 USAGE OF THE SOFTWARE APPLICATION

5.1 DICOMReader in open window mode



DICOMReader main window

When you start DICOMReader for the first time, the main window with open status list is the first thing you will see. A lot of relevant information can be found in here. You can change the behavior of the DICOMReader application startup by editing the options (see Chapter 4.1 of the DICOMReader 4.0 Administration Guide for more information).

5.1.1 Status, counter and configuration

(Screenshot LED blue) The status LED in the top left corner of the main window indicates the current status of the DICOMReader application. If the color of the LED is blue, this indicates that the DICOMReader is currently inactive and has no open jobs to do. If the color is green, this indicates that a job is currently being processed.

| | | |
|---------------|-------------------|--------|
| Scanned media | Transferred files | Errors |
| 0 | 0 | 0 |

Next to the status LED you can see the different counters showing how many different media have been scanned by the DICOMReader, how many files have been successfully transferred to any DICOM node and how many errors have come up during all jobs done so far. You can also set back these counters by right-clicking in

the area of the counter and choosing "reset global counter". The counter starts at zero at applications start.



In the upper right part of the main window you can find the "Manual media scan" button. A click on this button opens an explorer dialog where you can choose a directory which you want to scan. You can also choose if you want to scan recursively through all subfolders of the chosen folder.



In the top right corner of the main window you can find the "Options" button. A click on this button will open the configuration dialog of the DICOMReader. For more information about the configuration itself, please refer to the DICOMReader 4.0 Administration Guide.

5.1.2 Status list

The screenshot shows the DICOMReader 4.0 main window. At the top, there's a title bar with the application name and version. Below it, a status bar shows 'Scanned media: 3', 'Transferred files: 8', and 'Errors: 0'. The main area contains a table with the following data:

| # | Activity | Date | Time | Status | Progress | Destination | Files | Valid | Transferred | Patient names |
|---|----------|------------|----------|----------|----------|-------------|-------|-------|-------------|-----------------|
| 1 | ● | 2009-11-16 | 16:30:54 | Stopped | | | 4 | 2 | 0 | |
| 2 | ● | 2009-11-16 | 16:31:09 | Finished | | IQ-VIEW | 5 | 2 | 2 | Hodgkin, Sabine |
| 3 | ● | 2009-11-16 | 16:31:19 | Sending | 10% | | 41 | 37 | 4 | |

Status list with jobs

A very important part of the main window is the status list. All active, finished, stopped or failed jobs can be found in here. Furthermore, you can get various kinds of information about every single job:

- # - shows the number of the current job.
- Activity - shows a status LED for the current job.
- Date - shows the current date based on the system date. (format: yyyy-mm-dd)
- Time - shows the current time based on the system clock. (format: hh:mm:ss)
- Status - shows the status of the current job. The status can be: Scanning, Processing, Sending, Finished, Stopped, Failed
- Progress - shows a progress bar in case the current status is Scanning or Sending.
- Destination - shows the name of the DICOM station configured in the options (see Chapter 4.1.4 of the DICOMReader 4.0 Administration Guide). Only if the current status is Finished, the

| | | |
|---------------|---|--|
| | | name of the destination will be shown. |
| Files | - | shows the number of files that are processed. |
| Valid | - | shows the number of valid DICOM files of all files that are scanned in this job. |
| Transferred | - | shows the number of files that are successfully transferred to a DICOM station. |
| Patient names | - | shows the name(s) of the patient(s) that are processed in a job. |

Additionally, you can manually add more table headers to the status list or delete existing ones from it by right-clicking on one of the table headers, selecting a new one or unselecting an existing one:

| | | |
|---------------|---|--|
| Date and Time | - | shows a combination of Date and Time in one row. (format: yyyy-mm-dd hh:mm:ss) |
| Patients | - | shows the number of patients processed in this job. |
| Studies | - | shows the number of studies processed in this job. |
| Series | - | shows the number of series processed in this job. |

By right-clicking into the table you also have the possibility to filter the jobs. You can select between different options here to show only jobs from specific time spans, starting with "All" jobs and ending with all jobs of "This year".

Furthermore, you can stop the media scan by right-clicking on the job that should be stopped and select "Stop media scan" in the appearing context menu.

5.2 DICOMReader in hidden window mode

If you have selected the "start application minimized" option (see Chapter 4.1 of the DICOMReader 4.0 Administration Guide for more information) or minimized it manually, the DICOMReader will run as an icon in the system tray bar of your computer.

Double-clicking of the icon will re-open the main window.

Right-clicking on the tray bar icon will open a dialog window from which you can:

- Exit the DICOMReader,
- Open the dialog "About", to see information about your version of DICOMReader
- Show and hide the window
- Show the "Options" of the application
- Choose the "Destination" DICOMReader will send to automatically, prompt the user for a destination or use the rule-based sending feature (see Chapter 4.4 of the DICOMReader 4.0 Administration Guide for more information)

5.3 Scanning media

5.3.1 Automatic scanning of removable devices

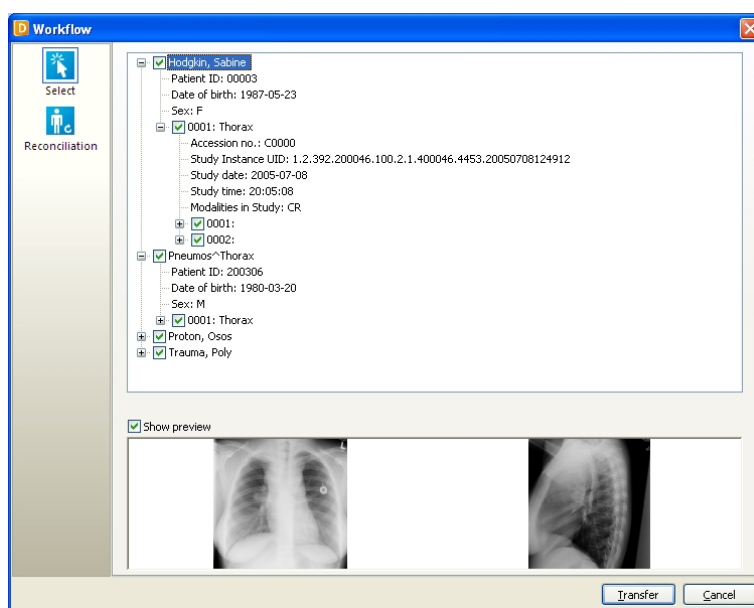
Unless the options "Autodetect CD/DVD media insertion" or "Autodetect USB storage device insertion (e.g. USB sticks or hard drives)" are deactivated in the "Media" category of the options dialog, (see Chapter 4.2 of the DICOMReader 4.0 Administration Guide for more information) DICOMReader will automatically add a new job to the status list and start the scanning process after inserting e.g. a CD/DVD or USB stick.

5.3.2 Manual scanning of directories

You can also scan any locally available directory or any directory inside of the network by clicking on the “Manual media scan” button in the top right side of the main window. An explorer dialog will open where you can choose the exact folder you want to scan. There is also an option to scan the selected folder recursively or not.

After you have selected a folder that you want to scan, DICOMReader will add a new job to the status list and start the scanning process.

5.4 Workflow



Workflow dialog

If the options “Select individual patients, studies, series or images [PRO only]” (see Chapter 4.2 of the DICOMReader 4.0 Administration Guide for more information) and/or “Modify patient and study information” (see Chapter 4.3 of the DICOMReader 4.0 Administration Guide for more information) are checked, the “Workflow” dialog will open after the scanning of the media is finished.

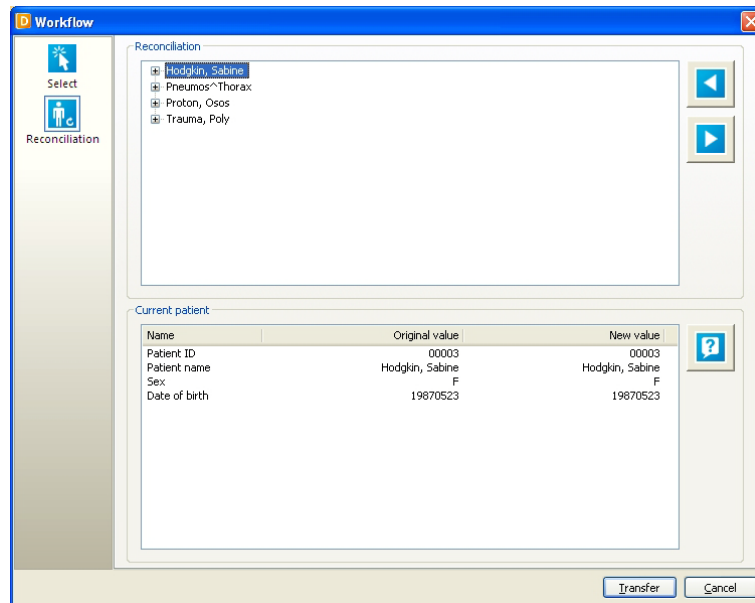
5.4.1 Selection of individual patients, studies, series or images

This feature is only available in the DICOMReader PRO version.

In this dialog you can select or unselect every particular patient, study, series and image that you want to send to the DICOM station. Additionally, you will be able to view plenty of information about the files that you have scanned comparable to the [“Media information dialog”](#).

Furthermore, you have the possibility to display thumbnail previews of the selected patient, study, series or image in the lower part of the dialog.

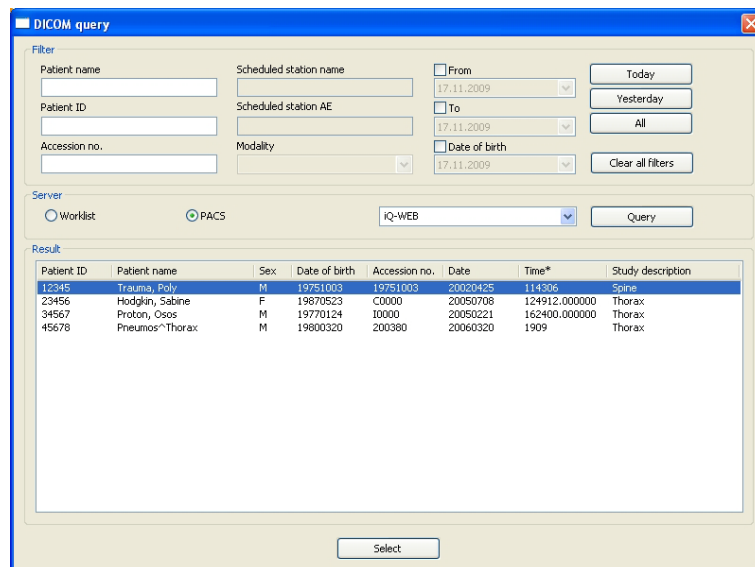
5.4.2 Reconciliation



Reconciliation dialog

In the "Reconciliation" dialog you can see a list of all patients and their studies in the upper part. In the lower part, the patient/study information of the currently selected patient/study is shown and can be edited here. If you have changed any of the values, it will be indicated by a red font color of the corresponding text. To reset the changed values back to the original values, just right-click into the box or directly onto a specific value and choose one of the different reset options.

5.4.2.1 DICOM query



Query dialog

When clicking on the "Query" button in the "Reconciliation" dialog, the "DICOM query" dialog will open. At the top of the dialog you have several different search filters, where you can filter the DICOM Worklist SCP or PACS for patient information like e.g. the Patient name, the Patient ID or the Accession number. You also have the possibility to use filters for different time frames, e.g. you can filter by entering a specific study date or use the "Today", "Yesterday" or "All" presets.

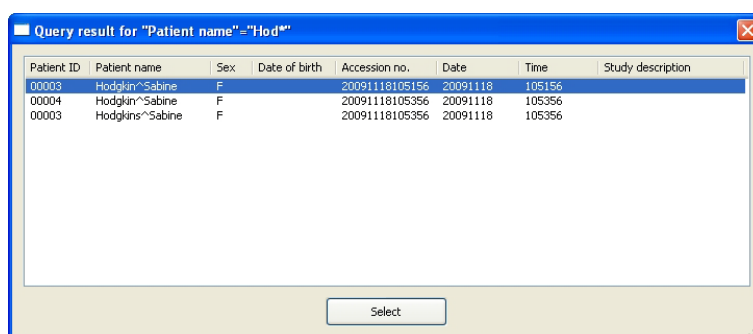
In the next group you can select the server from where you want to query. You can choose between a DICOM Worklist SCP or a PACS and select the destination in the drop down box. Every pre-configured server will be listed here (see Chapter 4.4 of the DICOMReader 4.0 Administration Guide for more information on how to configure DICOM stations).

If all settings are done, you can click on the Query button and the results of the query will be listed in the table in the lower group of the dialog. Now you are able to select the patient and the values of the patient information will automatically be stored in the "Reconciliation" dialog.

5.4.2.2 Auto query / weak query

This feature is only available in the DICOMReader PRO version.

The auto-query feature will, based on the configuration, automatically query the defined server to retrieve patient and study information. The server can either be a modality worklist server or a PACS. The query will be based on the patient name and the date of birth. In case the query result contains exactly one dataset it will be applied to the corresponding entry in the patient and study list. If the query result contains multiple datasets, the user will be prompted to select the corresponding dataset.



Query result dialog

If the query result contains no datasets and the weak query feature is enabled, DICOMReader will perform an additional query. The second "weak" query will only contain the first x letters of the patient name (you can choose any number of letters). The result will be handled in the same way as the result of the first query.

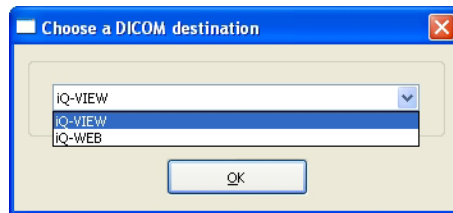
The auto-query and the weak query feature (if configured) will be performed for any entry in the patient and study tree control.

Please refer to Chapter 4.3 of the DICOMReader 4.0 Administration Guide for more information on how to configure the auto-query and weak query feature.

5.5 Sending of images

After altering the patient and study information, a click on “Transfer” will start the transfer of images to the destination. The destination can either be a default destination, a selected destination or it can be determined based on a ruleset (see chapter 4.4 of the DICOMReader 4.0 Administration Guide for more information on how to configure DICOM stations, DICOM send rules and how to select the send mode).

If “Prompt for destination” is configured as send mode, the user will be asked to select one of the configured stations.



Choose a DICOM destination dialog

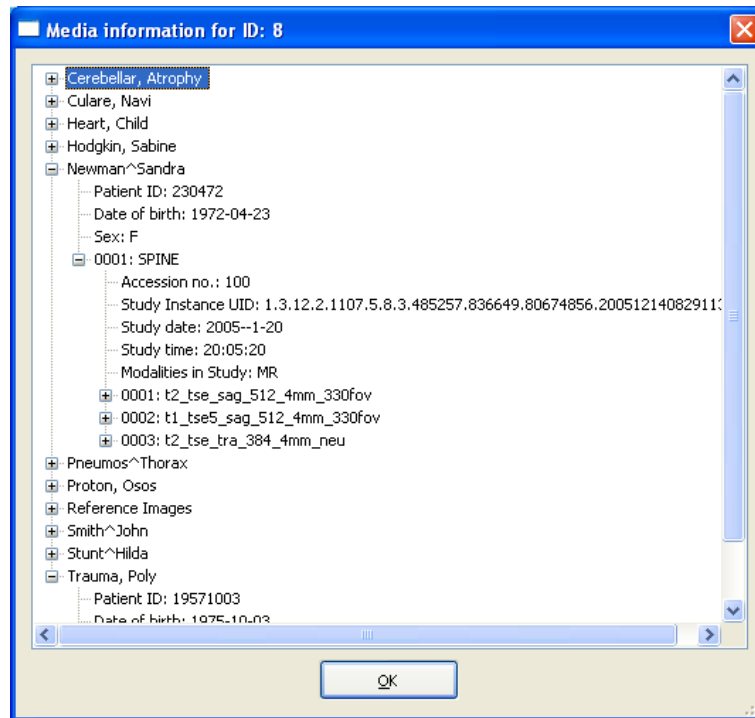
5.6 Sending of images in hidden window mode

If minimized, the running scanning / sending process is only indicated by a colored rotating system tray icon that is replacing the normal “idle” icon shown in gray.

However, the “Workflow” dialog for changing patient data is still displayed.

To view the status information, you will have to open the main window of the DICOMReader.

5.7 Media information dialog



Media information dialog

When a job has finished successfully, you can double-click or right-click on it and choose “Show media info”. The Media information dialog will open with all necessary information about the files that were scanned for this job. On the first level, every patient is listed in a tree view. You can open these patient entries and obtain general information on the second level like the Patient ID, date of birth or gender. Furthermore, all studies that correspond to the patient will be shown on the second level. When you open the different studies, you will get general information like the Accession Number, the Study Instance UID or the Study Date on the third level of the tree view. Every series of the study will also be shown here. In the fourth level, you will get general information like Series Instance UID, the Modalities in Study and the directory of every single DICOM file of the series.

Processed patient, studies, series or images will be displayed in black while unprocessed (excluded) data will appear grayed out.

6 FAQ (Frequently Asked Questions)

This section will give answers to some frequently asked questions and provide trouble-shooting.

NOTE:

*Basically, if an error occurs, you should send an email including the log file to support@image-systems.biz.
This will help us to trace the error.*

6.1 DICOMReader does not recognize TIFF, JPEG or BMP images.

Images in TIFF, JPEG or BMP format are not DICOM images. Therefore, they cannot be read-in by the DICOMReader. Please use the import function of your iQ-VIEW / iQ-VIEW PRO viewing station to import JPEG or BMP images. The import of TIFF images will be integrated soon.

6.2 You have problems reading STENTOR files.

There is currently no way of reading STENTOR files created with iSite, using an older version than V4.0 with the DICOMReader. STENTOR unfortunately does not publish its iSite data structure.

LIST OF ABBREVIATIONS

| | |
|--------|--|
| CD | – Compact Disk |
| CPU | – Central Processing Unit |
| DICOM | – Digital Imaging and Communication in Medicine |
| DVD | – Digital Versatile Disc |
| GB | – Gigabyte |
| IP | – Internet Protocol |
| MB | – Megabyte |
| PACS | – Picture Archiving and Communication System |
| PET/CT | – Positron emission tomography/Computed tomography |

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