DICOMatic 2.0 Connect Module

User's Guide

DICOMatic 2.0: Connect Module USER'S GUIDE
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DISCLAIMER:

Good data processing procedure dictates that any program be thoroughly tested with non-critical data before relying on it. The user must assume the entire risk of using the program.

Virtual Magic Inc. makes no representation or warranty with respect to the adequacy of readOmatic for any particular purpose or with respect to its adequacy to produce any particular results. In no events shall Virtual Magic Inc., its employees or its suppliers be liable for special, direct, indirect or consequential damages, losses, costs, changes, claims, demands, or claim for lost profits, fees, or expenses of any nature.

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1 Introduction
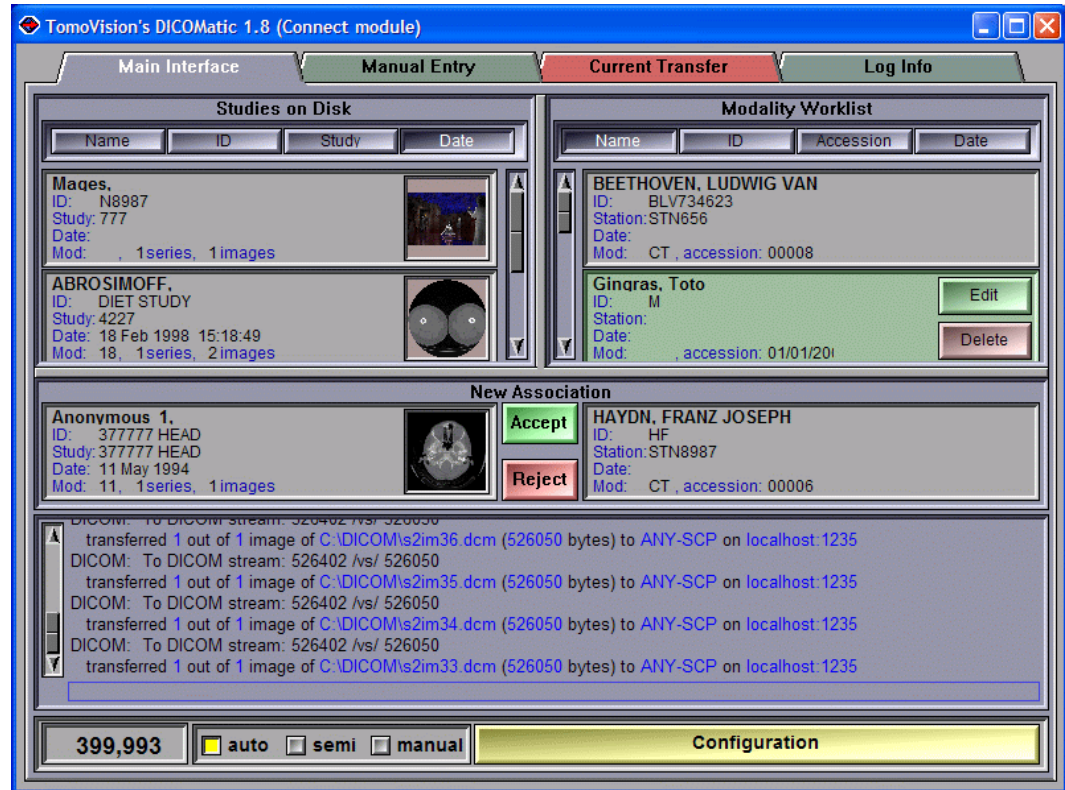
The Connect module of DICOMatic is a product designed to help integrate an older "non-DICOM" scanner to a modern DICOM network. Any non-DICOM scanner that supports an FTP server can be hooked up directly to a DICOM PACS with this application.

2 Installation

If you have the program's CD, just inserting the CD in the drive should start the installation script. In the absence of the CD, you can install the software directly from the download page at the Web site **http://www.TomoVision.com**.

Note:

> To install the software from the Web pages, you will need to have the "WinZip" software on your system. "WinZip" can be found at **http://www.winzip.com**.

To install the software directly from WinZip, click on the "Install" button in the WinZip interface. Alternatively, you can uncompress the files from the ".zip" archive to a temporary directory and click on the "setup" icon to start the installation program.

By default, readOmatic will be installed in the C:\Program Files\Tomovision directory. If you want the program to be installed somewhere else, you will have the option to select the desired directory during installation. You should not change the program's location after the installation.
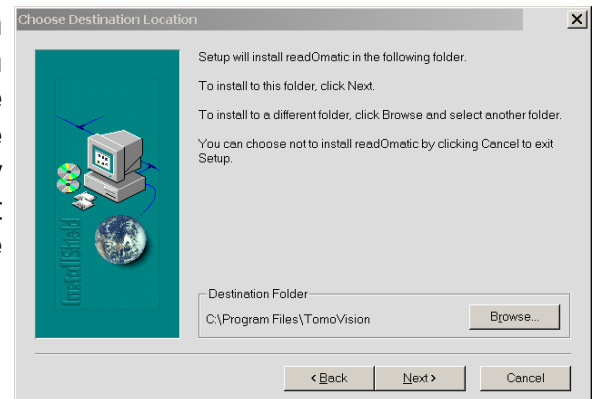
2.1 Updates

New versions of the program are regularly placed on the Web site. You should visit the Web site periodically to make sure you have the latest version.

To install a newer version of the software, follow the "First Install" instructions, and install the new version in the same directory as the old one. This will overwrite the old program with the new one. You do not need to uninstall the old version.

2.2 Uninstall

To uninstall the software, use the Windows "Add/Remove Programs" application in the usual manner.

3 The Licenses

TomoVision products use 2 layers of protections. A hardware layer, provided by the HASP (Hardware Against Software Piracy) dongles from Aladdin, and a software layer consisting of encrypted license activation codes and a token counter stored in the dongle's memory.
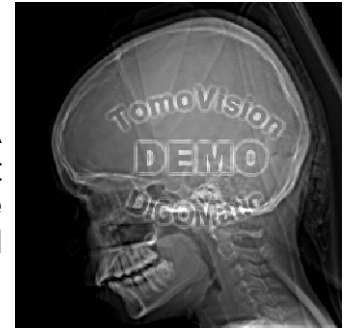
3.1 The HASP dongle

A dongle is a hardware device connected to the USB port. The dongle used by TomoVision has its own timer and memory. All the information needed to license your products is included in the dongle, so it's easy to move your application to a new computer.

If the dongle is not present on your computer, or if its drivers are not installed, the software will run in "demo" mode and some functions will not be available.

HASP dongle for th e USB port

3.2 The License Tokens

DICOMatic licenses work with tokens. Each action of the program will consume tokens. You buy these tokens from TomoVision. The token count is stored in a counter in the dongle's memory. When all the tokens are consumed, and the token count reaches zero, the software will only run in "demo" mode.

You can buy additional tokens and add them to the dongle at any time. TomoVision will generate a license code containing your tokens and send it to you by email. You then use the TomoVision_License program to add these tokens to the dongle's counter.

The licenses codes are specific to a dongle and are only valid once. Using them in TomoVision_License on an another dongle or more than once for their intended dongle will have no effect.
There are 2 types of Tokens, the **30 days tokens** and the **Permanent tokens**.

3.2.1 The 30 days tokens

The dongles are always shipped with 30 days tokens. The reasons for this are twofold:

- As soon as we get a P.O., we ship the dongle with the 30 days tokens. This enables you to start working with the product immediately while the payment is handled by the accounting department of your institution.
- If the dongle gets lost in transit, we can replace it without worrying about multiple licenses being issued, since the tokens in the lost dongle will expire in 30 days anyway.

Also, when you order additional tokens, we will first send you a license code for 30 days tokens. Once we receive payment for your order, we will send you the license code for the permanent tokens by email.

As the name implies, 30 days token are only valid for 30 days. The 30 days are controlled by an internal clock in the dongle and are independent of your computer's clock. The 30 days are counted from the moment the license was generated at our office.

3.2.2 The Permanent tokens

The license codes for the Permanent tokens are sent by email and you must use the TomoVision_License program to add them to the dongle's counter.

When you add Permanent tokens to the dongle's counter, any 30 days tokens that where used will be subtracted from the Permanent token total.

WARNING:

The permanent tokens must be added to the dongle's counter with the TomoVision_License program within 30 days of their creation at our office. After that deadline, the TomoVision_License program will reject them and you will have to contact TomoVision for replacement codes.

3.3 The TomoVision_License program

The TomoVision_License program is used to read and write license codes in the HASP dongle and to generate a registration form if needed. Each dongle has an unique ID number. This unique ID is used by TomoVision when the license codes are generated, so the licenses are only valid for a specific dongle.

The TomoVision_License program is installed automatically along with your TomoVision application. But you can also download it directly from the "Tools and drivers for the license dongle" page in the Download section of TomoVision's web site.

Start the TomoVision_License program from the **start\program\TomoVision** menu.

3.3.1 Generating the Registration Form

Unless asked for by TomoVision, you do not need to generate a registration form.

If TomoVision asks for it, you should:
• Make sure the HASP dongle is connected to your computer.
• Start the TomoVision_License program.
• Click on the "Generate Registration Form" button. This will create a registration file in the c:\temp directory. This file will be named: "TomoVision_xxyyyzz_reg.dat", where xxyyyzz is the current date in the form day/month/year.
• Fill out this form (you can use Windows "Notepad" or any other editor to edit the form).
• Email the form to "sales@TomoVision.com"
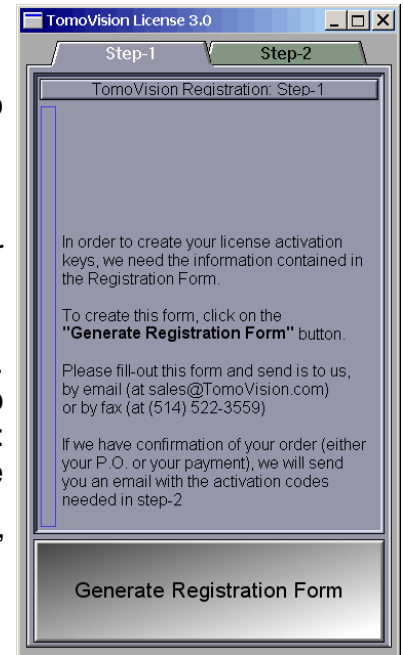
3.3.2 Activating the Licenses

The program "TomoVision_License" is used to add the license tokens to the dongle's counter.

Just drag & drop the license codes file, sent to you by TomoVision, on the License program. All the license codes present in the file will be entered. The indicators on the corresponding buttons in the module list should turn yellow and the counters will be updated.

If the code is invalid or a problem has occurred, a text message will explain the reason in the text feedback window.

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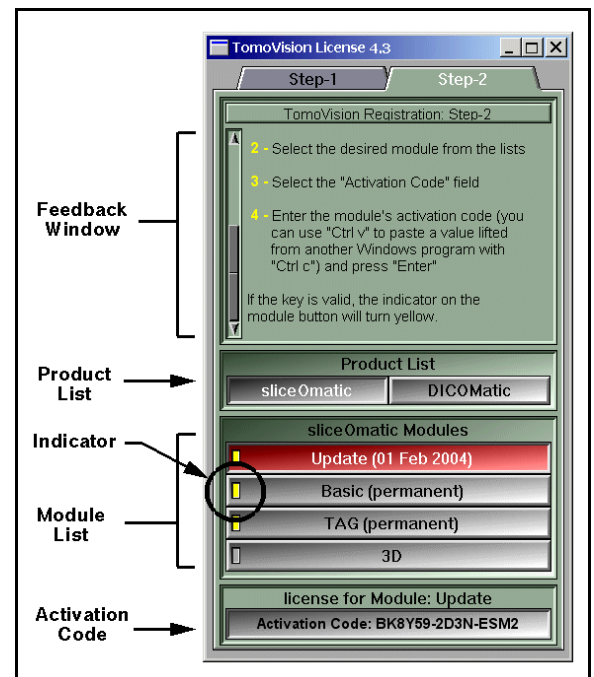
3.4 This Module's token usage

Connect use the conversion module of DICOMatic to convert the images from their original format to DICOM. This conversion will consume tokens.

Each image file converted will use one token.

However, if a file contains multiple images, then the module may use more than one token depending on the number of images and their size in pixels. The module will use 1/16 of token for each image of 64x64 pixels or smaller, ¼ of token for images between 64x64 and 128x128 pixels and 1 token each for bigger images. The resulting count will be rounded up to the next integer.

4 How does it work?

The Connect module functionality can be divded in 5 parts:
- Getting the images in the computer
- Converting the images to DICOM
- Reconciliating the images with the Modality Worklist
- Sending the images to their desired location
- Cleaning up the "Watched" directory

4.1 Getting the images in the computer

The first part of the problem is getting the images in the PC where Connect is running. Connect expect the images to be in a specific directory called the "Watched" directory. If you are reading the images from a CD or DVD, then you just have to tell the program that the "Watched" directory is the CD or DVD drive. If your images are on another medium (tape or MOD), you may want to use readOmatic to transfer the images from the media to the "Watched" directory. If your scanner is directly connected by network to the PC and you are able to export the images from the scanner to the PC, just export them to the Watch directory.

But, sometimes, getting the images from the old scanner to the PC can be the most difficult part of the problem. In fact, if the old scanner does not have any communication port or archive device, it can be impossible!

However, even if your scanner does not seem to have any "Network" or "Export" capability, it is probably (like most old scanners) based around a 1980s minicomputer. These computers usually have an Ethernet port. And also, they usually have an "FTP server" running in the background. If this is the case, then the FTP layer of Connect can talk to these old systems and transfer the images directly from their hard disk to the "Watched" directory.

In the "Network" configuration page, you can specify the information needed by the FTP layer of the program. Connect can access up to 4 different FTP servers, so you can use Connect to get the images from 4 different sources. For each of these, up to 4 templates can be used. This can be useful if, for example, the images are placed in 2 or more directories on your scanner's system.

Connect keeps a list of the files it has already transferred from each FTP server. If the program is interrupted, it will consult this list to make sure the same file is not transferred twice.   These file are named "Connect_FTP_List_1.dat" to "Connect_FTP_List_4.dat" in the scratch directory.

For more detailed instruction on how to connect to a UNIX system, please refer to the TomoVision's Web site FAQ.

4.2 Converting the images to DICOM

All the images present in the "Watched" directory will be read by the program and converted to DICOM if they are not already in that format.

The location of the "Watched" directory is specified through the "Configuration" interface, or it can be specified directly in the Connect.ini file.

A copy of the original image in its native format can also be preserved, either in the "**Kept**" directory, if the conversion is successful, or in the "**Failed**" directory if not.

Connect keeps a list of the files it has already processed. If the program is interrupted, it will consult this list to make sure the same file is not processed twice. This file is in the scratch directory and is named "Connect_Watch_List.dat".

4.3 Reconciliation of the images with the Modality Worklist

Once the images are in DICOM, you have the option to do a reconciliation of the image's header information with the information presented in the Modality Worklist. This can be used to correct erroneous patient information in the image's header, or to import missing fields in the header from the Modality Worklist.

You have a choice of 3 modes: The Auto, Semi and manual modes.

In the Manual mode, on the left hand side of the interface is a list of the studies presently in the "Watched" directory, and on the right hand side is the list of entries in the Modality Worklist server. You just have to select one of each and accept the match.

In the Semi automatic mode, the same lists are presented, and the program attempts to make the match by itself. The results of these attempts are presented to you, you just have to decide whether you accept these matches or not. If you refuse a match, you can always make your own match manually.

In the Auto mode, the program make the matchs and does not ask for your confirmation. If a study cannot be matched, and it has been present in the "Watched" directory for more than a specified period of time ("Send-as-is" delay), it will be sent "as is", without any Modality Worklist reconciliation.

4.4 Sending the images to their desired location

The DICOM images are then transferred to your desired location. This location can either be a DICOM network (up to 4 different servers), an FTP server (up to 4 different servers) and/or the "Done" directory on the PC.

If the images are saved in the "**Done**" directory, you have the option of renaming the converted files using information from its content. The new name will have the syntax: E*xxxx*_S*yyy*_I*zzzz*

> "E" (for Exam) followed by the exam's ID or number
> "S" (for series) followed by the series' number
> "I" (for Image) followed by the image's number.
>
> If there is more than one acquisition, the "I" character is replaced by a single upper-case letter representing the acquisition number (A = acquisition 1, B = acquisition 2...).

If the images are saved in the "**Done**" directory, you also have the option of creating up to 2 levels of subdirectories when the file is saved. You can create a first subdirectory for each study and a second for each series in a study. The name of the study directory can be the Patient's name, the Patient's ID or the Study ID. The name of the series subdirectory is the series' ID number.

If the images are pushed to a DICOM server, you can define up to 4 servers. The images will be pushed to each of these.

If the images are pushed to a FTP server, you can define up to 4 servers. The images will be pushed to each of these.

4.5 Cleanup of the "Watched" directory

Once a file has been processed, it is no longer needed in the "Watched" directory. However, if the "Watched" directory is on a read-only medium, or if it is a directory used by another application (the database of a scanner for example), you may not wish to delete the files. There is a flag for this in the "Watched" directory configuration page.

If the image is not removed, the program needs to have a way of knowing that the file has already been processed. This is why it keeps a list of all the files already processed and still available in the "Watched" directory. This file is called

"Connect_Watch_List.dat" and it resides in the scratch directory (by default c:\temp).

5 Operation

5.1 Starting the program

5.1.1 From the "Start" menu or the program's icon

Connect can be started from the menus under "Start, Programs, Tomovision". Alternatively, you can start the program by clicking on its icon.

5.1.2 From the command line

You can use optional command line arguments when you start Connect. See Appendix A: "Command line arguments" for more information on this subject.

5.2 The Connect.ini file

All of the program's configurations can be controlled with the connect.ini file.

There can be 2 copies of this file: one is in the installation directory (by default: C:\Program Files\TomoVision), the other is in the user's environment space (on XP: C:\Documents and Settings*user_name*\Application Data\TomoVision, where *user_name* is the current user).

The program will read the copy in the installation directory first, and then, if the file is present, read the copy in the user's environment space. This enable each user to overide the default configuration parameters.

The "Config" button can be used to modify the values of the connect.ini file in the user's environment space.

For a more detailed discussion of the connect.ini file, please refer to Section 6.

5.3 The Configuration window

The behavior of the Connect module is controlled by the connect.ini file. There are 2 copies of this file. The first copy in the installation directory (c:\Program Files\TomoVision) is used for default values. The second copy, in the user's "Documents and Settings" directory, can be modified interactively through the Configuration window.

The exact syntax and content of the ".ini" file is discussed in more details in Section 6.
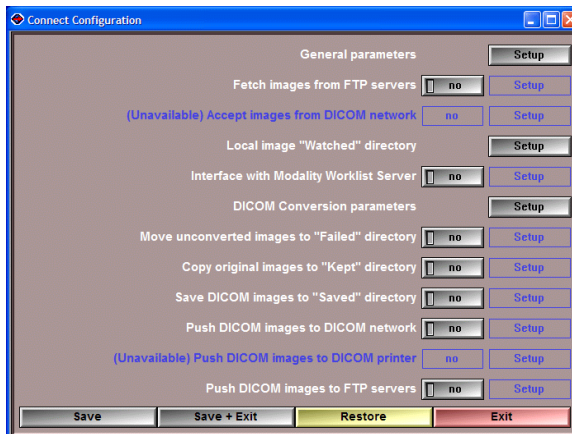
The main page of the Configuration window give you access to 12 sub-pages. Each of these is used to set the parameters for a specific task. Some of these tasks can be turned off. If the task is off, then the sub-page is not needed and is not accessible.

Both DICOM_Watch and the Connect modules share the same configuration interface. Some option sub-pages are only available in one of these modules.

Save　　　Save the new changes to the .ini file in the user's "Documents and Settings" directory.

Save + Exit Save the new changes to the .ini file and close the Configuration window.

Restore　　Reset all the parameters to their values found in the .ini file in the installation directory.

Exit　　　Close the Configuration window without saving the new changes to the .ini file. The changes will only be applied to this session of Connect.

Note:

Even if not saved, all change done in the configuration will be used by the current session of the program.

5.3.1 The "General parameters" page

This page enables you to modify some of the parameters that are not specific to one task in particular.
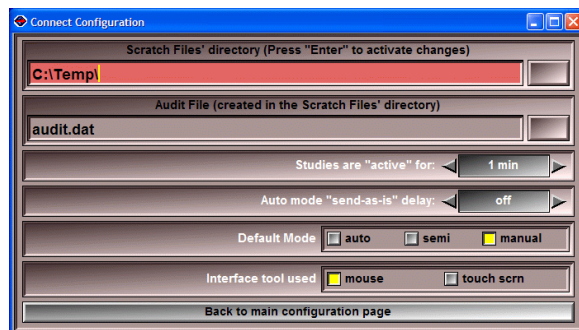
Scratch files' directory	Any temporary, trace and audit files created by the program will be created in this directory.
Audit file	An "AUDIT" trail of all the actions performed on the images will be appended at the end of this file.
"active" parameter	If all the files in a study are older than this delay, once the study is transferred, it is considered finished and removed from the "Current Transfer" list. However, if one or more of the images have been created within the delay, the study is considered still active, and it is possible that other files from the same study will appear in the "Watched" directory.
"Send-as-is" delay	In auto mode, Connect tries to match studies with the Modality Worklist. If no match is found and the image is older than the delay, then it is sent "as is" without the complementary information that could have been provided by the Modality Worklist. Otherwise, the program waits until the file is older than the delay to give a chance to the Modality Worklist to catch up. Of course if you do not use the Modality Worklist, you can set this delay to 0.
Default mode	Set the default startup mode for Connect.
Interface tool used	The program can be used either with a mouse or a touch screen.

5.3.2 The "Fetch images from FTP servers" page

Note:

This page is only available in the Connect Module.

This page enables you to set the parameters necessary for the FTP pull operation. The program can retrieve images from up to 4 FTP servers. For each of these, it can retrieve files matching up to 4 different templates. This can be used to fetch images with different extensions, or from different directories.
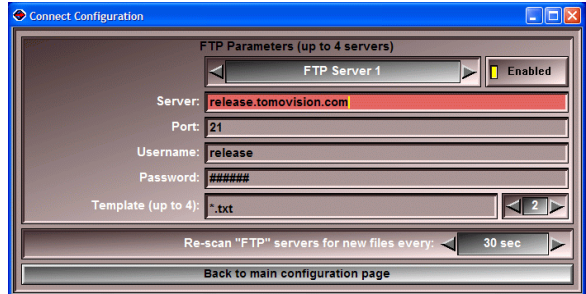
Server selection You can enable or disable each of the 4 server locations. If a server is enabled, the program will query this server repeatedly, at the interval specified, to fetch any new images matching the specified templates. A list of files already extracted from each server is kept in the scratch directory (by default C:\temp).

Server The name (or IP address) of the computer running the FTP server

Port The port number used by the FTP server

Username The login name of the user

Password The password for the user

Template For each server you can access up to 4 templates. If the desired images are on a subdirectory, the template must have this directory path. (Ex: dir_1\sub_dir_1*.ima). This will enable you to retrieve images from up to 4 different directories on the same scanner. This template uses the UNIX syntax for character replacements (See Appendix B).

WARNING:

The password specified in the "passwd" field will not be visible in this interface. However, it will be visible in the .ini file.

5.3.3 The "Accept images from DICOM network" page

Note:

This option is currently unavailable.

This option is currnetly unavailable, however, if you desire to receive images from the DICOM network and have Connect use them, we suggest you install OFFIS tool "storescp" in the "Watched" directory and let it run in the background. It will act as a DICOM server and place all the images it receives directly in the "Watched" directory.

5.3.4 The "Watched" directory page

This page specifies the location of the "Watched" directory. The program will periodically scan this directory for any new files. To prevent the program from processing files that are still incomplete, a set of conditions can be imposed before a file is accepted.
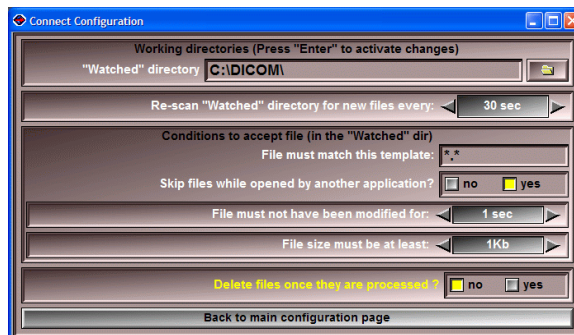
"Watched" directory   Path to the "Watched" directory. You must press the enter key for the path to be accepted. You can use the folder button to browse existing directories.

Rescan delay   The program looks in the "Watched" directory every "n" seconds. You can select the value of "n" here. If n=0, the program will look in the "Watched" directory only once.

Conditions to accept files   You can use the following criteria to limit the files that are processed.

Template The file must match the template. This template uses the UNIX syntax for character replacements (See Appendix B).

Exclusive   The file should **not be opened by any other application**. Typically, if the file is still being transferred, it will also be opened by the transfer program.

Age   The file **must not have been modified for** at least "n" seconds. Transfer programs seldom take more than a few seconds. Fixing this value high enough ensures that the transfer is complete. The value "off" (=0 in the .ini file) disables this criterion.

Size   The **file must be at least** "n" bytes in size. If the image files are not compressed, you should have a good idea of their minimum size. The value "off" (=0 in the .ini file) disables this criterion.

Delete files once they are processed   After a file is being processed, it can be deleted from the "Watched" directory.

WARNING:

> If the "Watched" directory is read-only (such as a CD), or a directory that you would want to be "write protected", you must set "Delete files once they are processed" flag to "no".

5.3.5 The "Modality Worklist" page

Note:

This page is only available in the Connect Module.

This page enables you to specify a Modalilty Worklist Server. If such a server is specified, then the program will query it at fixed intervals and create a list of entries that can be matched with the studies in the "Watched" directory. You can use the "filter" parameters to limit the entries in the list.
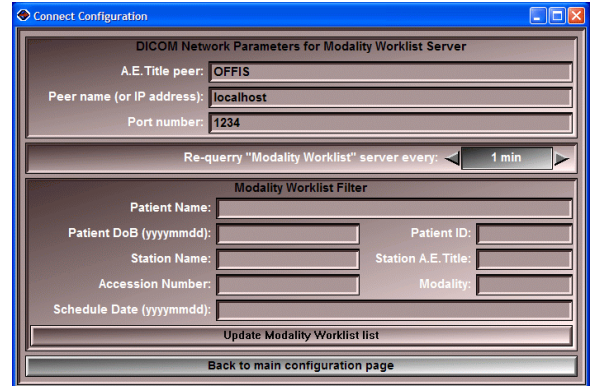
DICOM Network Parameters — The parameters you enter here will be used to access the Modality Worklist server.

A.E.T. peer — This is the name (Application Entity Title) of the Modality Worklist. Your PACS may need this name to be correct in order to accept the images. Please consult your local PACS administrator if you need this information.

Peer name — Name or URL of the computer running the Modality Worklist server.

Port Number — The port on the PC used to establish the communication. By default, DICOM uses the port 104.

Note:

The A.E.T. sender name is specified in the DICOM push parameter page.

Rescan delay — The program queries the Modality Worklist server every "n" seconds. You can select the value of "n" here.

Modality Worklist Filter — When Connect queries the Modality Worklist server, it can specify filters to limit the number of answers to the query. If a filter is left

empty, it will not be used to filter the Modality Worklist entries. The information entered in each filter will be sent to the Modality Worklist Filter.

The filters you can use are: **Patient Name**, **Patient DoB, Patient ID**, **Station Name**, **Station A.E.Title**, **Accession Number**, **Modality**, **Schedule Date**.

Note:

Please refer to your Modality Worklist instructions to know which of these fields it can use and the exact syntax it supports.

Update Modality Worklist List   This will cause Connect to re-query the Modality Worklist server using the newly specified parameters

5.3.6 The "DICOM conversion parameters" page

This page is used to specify the parameters used in the DICOM conversion. All these options are described in more detail in the DICOMatic Conversion Module's manual.
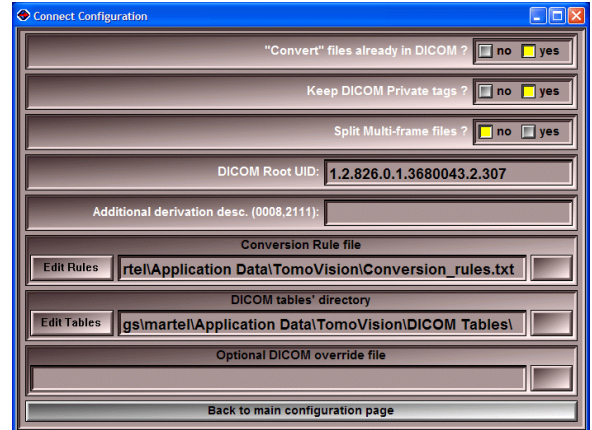
Keep DICOM private tags?	If the original image has private tags, these can be removed or preserved in the converted image.
Split Multi-frame files?	Some DICOM modalities support multi-frame files. If the original file contains multi-frame, the program can attempt to create a multi-frame DICOM file.
DICOM Root UID	The root UID used by the program to create most of the image's UID. By default, this value is TomoVision's UID. You can replace it by your enterprise UID if you have one.
Additional derivation description	The program will append "converted from xxx by DICOMatic 2.0 rev-zz" to the derivation description tag (0008,2111). If you want to add more information, any text you enter here will be appended after the DICOMatic message.
Conversion Rules file	The path to the user's "Conversion Rules" file used by the program. By default, this will be the "conversion_rules.txt" file in the user's "Documents and Settings" directory ("C:\Documents and Settings*user name*\Application Data\TomoVision")
	The "Edit Rules" button enables you to modify the rules file. Please refer to the DICOMatic Conversion Module manual for a detailed description of this option (section 5.3.2 The "Conversion Rules" page).
DICOM tables' directory	The path to the DICOM tables used by the program. By default, this will be the "DICOM Tables" directory in the user's

"Documents and Settings" directory ("C:\Documents and Settings*user name*\Application Data\TomoVision")

The "Edit Tables" button enables you to modify the rules file. Please refer to the DICOMatic Conversion Module manual for a detailed description of this option (section 5.3.3 The "DICOM Modality" page).

Optional DICOM override file　　This file, using the DICOM Attribute table syntax, can be used to modify the DICOM tag values created. It will be read before any other DICOM table. You can use it, for instance, to anonymize your images: just have the "DICOM override file" parameter point to a file with override values for the patient name, ID, and any other TAG you want anonymized.

5.3.7 The "Failed" directory page

This page is used to specify the "Failed" directory. If the conversion process fails, either a copy, or the original image itself, will be placed in this directory. If the "Delete files once processed" flag in the "Watched" page is set, the original image will be moved, otherwise, a copy of the original will be created.
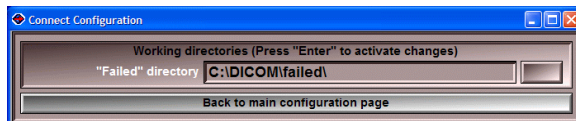
"Failed" directory   Path to the "Failed" directory. You must press the Enter key for the path to be accepted. You can use the folder button to browse existing directories. If you specified a non-existing directory, the program will ask permission to create it.

5.3.8 The "Kept" directory page

This page is used to specify the "Kept" directory. If the conversion worked, either a copy, or the original image itself, will be placed in this directory. If the "Delete files once processed" flag in the "Watched" page is set, the original image will be moved, otherwise, a copy of the original will be created.

"Kept" directory   Path to the "Failed" directory. You must press the Enter key for the path to be accepted. You can use the folder button to browse existing directories. If you specified a non-existing directory, the program will ask permission to create it.

5.3.9 The "Saved" directory page

This page is used to specify the "Saved" directory. If the conversion worked, a copy of the converted DICOM image will be placed in this directory.
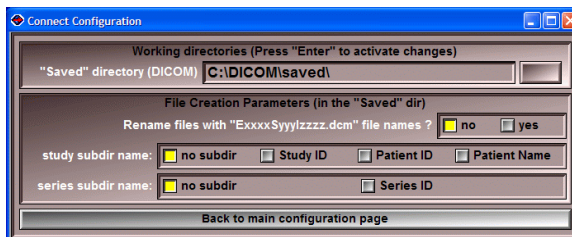

|	
"Saved" directory	Path to the "Saved" directory. You must press the Enter key for the path to be accepted. You can use the folder button to browse existing directories. If you specified a non-existing directory, the program will ask permission to create it.
File Creation Parameters	By default, the converted files will all be placed in the same directory and they will have the same name as the original but with the ".dcm" extension. You can change this with the following options:
Rename files	The program can rename the converted files using information from its content. The new name will have the syntax: E*xxxx*_S*yyy*_I*zzzz* "E" (for Exam) followed by the exam's ID or number "S" (for series) followed by the series' number "I" (for Image) followed by the image's number. If there is more than one acquisition, the "I" character is replaced by a single upper-case letter representing the acquisition number (A = acquisition 1, B = acquisition 2...).
Subdir per study	The program can create a new subdirectory for each study. The name of this subdirectory can be: the Patient's name, the Patient's ID or the Study's ID.
Subdir per series	The program can create a new subdirectory for each series.

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5.3.10 The "Push DICOM images to DICOM network" page

This page enables you to setup the parameters needed for the program to push the converted images on the DICOM network. You can push the image to up to 4 servers.
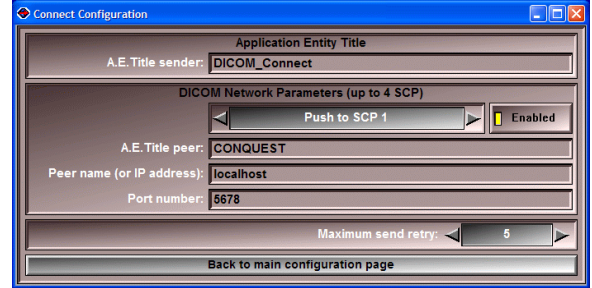
Application Entity Title

A.E.T. sender	The "Application Entity Title" of the sender. This is the name you give to the sending application. By default it is "Connect".

Note:

The A.E.T. sender name you give here will also be used for the Modality Worklist server.

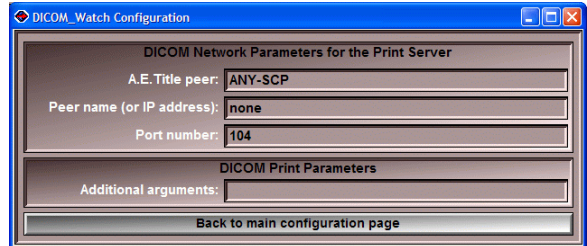| **DICOM Network Parameters**	The parameters you enter here will be used to access the 4 SCP servers to which the program can "push" images.
Server selection	You can push the images to up to 4 different servers.
A.E.T. peer	This is the name (Application Entity Title) of the SCP receiving the images. Your PACS may need this name to be correct in order to accept the images. Please consul your local PACS administrator if you need this information. By default it is "ANY-SCP".
Peer name	Name or URL of the computer where you send the images.
Port Number	The port on the PC used to establish the communication. By default, DICOM uses the port 104.

Maximum Send retry	If the DICOM Push operation failed, the program will attempt it again for a maximum of "Maximum send retry" times.

5.3.11 The "Push DICOM images to DICOM printer" page

Note:

This page is only available in the DICOM_Watch Module.

This page enables you to setup the parameters needed to send the images to a DICOM printer.

DICOM Network Parameters   The parameters you enter here will be used to access the DICOM printer.

    A.E.T. peer   This is the name (Application Entity Title) of the DICOM printer. Your PACS may need this name to be correct in order to accept the images. Please consult your local PACS administrator if you need this information.

    Peer name   Name or URL of the printer server.

    Port Number   The port on the PC used to establish the communication. By default, DICOM uses the port 104.

Note:

The A.E.T. sender name is specified in the DICOM push parameter page.

DICOM Print Parameters   Everything in this field will be sent "as is" to the "dcmpsprt" program.

Note:

The "DICOM Print" option is implemented using the "dcmpsprt" program from OFFIS. This program must be present in the same directory as DICOM_Watch for this option to work (by default: c:\Program Files\TomoVision). For more information on "dcmpsprt", please refer to OFFIS' documentation.

5.3.12 The "Push DICOM images to FTP servers" page

Note:

This page is only available in the Connect Module.

This page enables you to set the parameters necessary for the FTP push operation. Connect can push converted images from up to 4 FTP servers. These files can be renamed and placed in a subdirectory if desired.
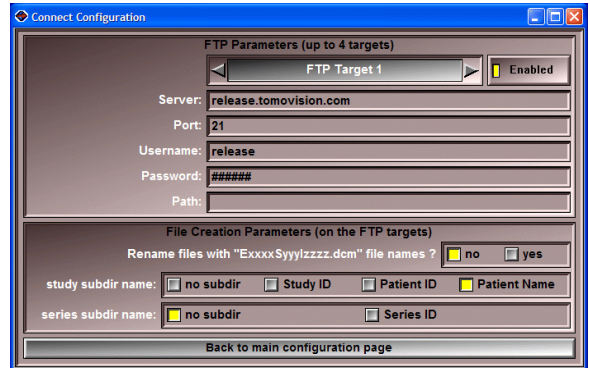
Server selection You can enable or disable each of the 4 server locations. If a server is enabled, the program will push the converted images to this server.

Server   The name (or IP address) of the computer running the FTP server

Port   The port number used by the FTP server

Username   The login name of the user

Password   The password for the user

Path   The directory where the images are to be placed on the FTP server.

WARNING:

The password specified in the "passwd" filed will not be visible in this interface. However, it will be visible in the .ini file.

File Creation Parameters By default, the converted files will all be placed in the specified directory and will have the same name as the original but with the ".dcm" extension. You can change this with the following options:

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Rename files   The program can rename the converted files using information from its content.   The new name will have the syntax: E*xxxx*_S*yyy*_I*zzzz*

"E" (for Exam) followed by the exam's ID or number
"S" (for series) followed by the series' number
"I" (for Image) followed by the image's number.

If there is more than one acquisition, the "I" character is replaced by a single upper-case letter representing the acquisition number (A = acquisition 1, B = acquisition 2...).

Subdir per study   The program can create a new subdirectory for each study. The name of this subdirectory can be: the Patient's name, the Patient's ID or the Study's ID.

Subdir per series   The program can create a new subdirectory for each series.

6 The Connect.ini file

The connect.ini file is used to set a number of the program's internal variables.

The program can read this file from two different locations. The first is in the installation directory (by default: "C:\Program Files\TomoVision"). The second (if present) is in the user's "Documents and Settings" directory (by default in XP: "C:\Documents and Settings*user name*\Application Data\TomoVision"). If a parameter is defined in both versions of the file, the one in the user's "Documents and Settings" version will be used.

6.1 The syntax

- everything on a line following a ";" character is a comment and will not be read by the program
- the lines are composed of a keyword, followed by a "=", followed by an argument.
- arguments containing spaces must be protected by quotes (example: scratch = "C:\name with spaces must be quoted")
- the keywords are not case sensitive, but the arguments are.

6.2 Page 1: General configuration parameters

scratch = *dir_name*   Set the name of the directory used for temporary and trace files to "dir_name" (Default value is C:\temp).

audit = *file_name*   Set the name of the audit trace file. This file will be created in the scratch directory. If this parameter is not defined, no audit file will be created. (Default value is "TomoVision_Audit.txt").

trace = *value*   Starting trace level value (between 0 and 5) (Default value is 0).

delay_active = *value*   Activity delay (in sec). A new study will remain "active" for "delay_active" sec (Default value is 60).

delay_auto_send = *value*   Auto-send delay (in sec). In mode "Auto", a study will be sent without matching worklist after "delay_auto_send" sec (Default value is 30).

startup_mode = *value*   Startup mode. Auto=0, Semi=1, Manual=2 (Default value is 0).

touch_scrn = *flag*   Touch Screen mode.   Mouse interface=0, Touch screen=1 (Default value is 0).

6.3 Page 2: FTP Pull parameters

sleep_ftp = *value*   Sleep delay between FTP server rescan (in sec). The program will scan the FTP servers and pull all the images matching the templates every "sleep_ftp" sec. (Default value is 30).

The program can pull images from 4 FTP servers. The following parameters are defined for each of these. Replace "*n*" by 1, 2, 3 or 4.

ftp_in_on_*n* = *flag*   Enable (=1) or disable (=0) each of the 4 FTP pull operations individually. (Default value is 0).

ftp_in_server_*n* = *string*   name or URL address of the target FTP server.

ftp_in_port_*n* = value   port used by the FTP server.

ftp_in_username_*n* = *string*   user name used to login in the server.

ftp_in_password_*n* = *string*   password used to login in the server.

For each FTP server, the program can use 4 templates to pull these images. These templates can be used to extract images from different directories, or with different names or extensions. Replace "*m*" by 1, 2, 3 or 4.

ftp_in_template_*n*_*m* = *string* Template used to extract the images.

WARNING:

> The password is not encrypted. Anybody who can read the .ini file will have access to the password information.

6.4 Page 4: The Watched directory parameters

watch_dir = *dir_name*   "Watched" directory name.

sleep_watch_dir = *value*   Sleep delay between "Watched" directory rescan (in sec). The program will scan the "Watched" directory for new images every "sleep_watch_dir" sec. (Default value is 30).

The following conditions are used to prevent the conversion of files that are still in transit between the scanner and the PC.

exclusive = *flag*   Exclusive access condition (0/1 flag). To be converted a file must not be opened by any other application. (Default value is 0)

age = *value*   Age condition (in sec). To be converted, a file must be older than "age" sec. (i.e. it must not have been written to in the last "age" sec.) This is to prevent the program from converting files that are still in transit. A value of 0 disables this condition. (Default value is 30 sec)

size = *value*   Size condition (in bytes). To be converted a file must be at least "size" bytes in size. A value of 0 disables this condition. (Default value is 1024 bytes)

watch_template = template   To be converted a file must match this template. (Default template is "*.*")

delete = flag   Delete processed files flag. If set the files will be deleted from the "Watched" dir after being processed (converted, saved or pushed).

WARNING:

If the "Watched" directory is a read-only media (CD or DVD), or from a directory where you do not want to delete any files (such as the scanner's console database), you need to set this flag to 0.

6.5 Page 5: The Modality Worlist parameters

sleep_worklist = *value*

Sleep delay between Modality Worklist queries (in sec). The program will query the Modality Worklist server every "sleep_worklist" sec. (Default value is 60).

The program can query one Modality Worklist server.

worklist_on = *flag*

Enable (=1) or disable (=0) the Modality Worklist server query. (Default value is 0)

worklist_AET = *string*

Application Entity Title of the Modality Worklist server. (Default value is ANY_SCP)

worklist_peer = *string*

Name of the Modality Worklist server's computer. It can also be the URL address of the server. (Default value is "unknown")

worklist_port = *value*

port used by the Modality Worklist server. (Default value is 104)

You can limit the number of entries returned by the Modality Worklist query by using filters. Please consult your Modality Worklist manual for the filters that are supported and their syntax.

filter_patient_name = *string*

filter_patient_id = *string*

filter_modality = *string*

filter_station_aet = *string*

filter_station_name = *string*

filter_accession = *string*

6.6 Page 6: The conversion parameters

derivation= *string*	This string is appended at the end of the derivation description (tag (0008,2111))
passthrough= *value*	When value=1, if possible, any private tag present in the source file will be preserved in the output file. If value=0, the private tags will not be copied to the output file.
root_uid= *string*	all UIDs (Unique Identification Numbers) created in DICOMatic start with this prefix value. (Default value is 1.2.826.0.1.3680043.2.307)
tables= *name*	Set the name of the subdirectory where the DICOM tables are stored in the user's "Documents and Settings" directory. (default value is "DICOM Tables")
rules= file_name	Set the name of Conversion Rules file in the user's "Documents and Settings" directory. (Default value is "conversion_rules.txt")
override= *file_name*	Give the name of an optional "override" DICOM table file. This file, using the DICOM Attribute table syntax (see section 8.2), can be used to modify the DICOM tag values created. It will be read before any other DICOM table. (Default none)
split_multiframe= *flag*	Always split multi-frame files in separate DICOM files containing only 1 image each (=1), or try to create multi-frame DICOM files (=0). (Default value is 0)
fixed_seq_size= *flag*	DICOM supports 2 ways of specifying the length of sequences and items: with a fixed length (=1), or with an undefined length and seq/item delimiter tags (=0). (Default value is 0)
create_elem_0000= *flag*	In the latest version of the DICOM standard, the tag "0000", "group length", has been retired. If you wish to create this element nevertheless, use value=1. (Default value is 0)

create_contributing_equip= *flag*   Do we create the Contributing Equipment Sequence (0018,A001)? If you wish to create this sequence, use value=1. (Default value is 1)

6.7 Page 7: The "Kept" directory parameters

kept= *flag*

Keep original files flag. If set (=1), the original will be transferred/copied to the "kept_dir". (Default value is 0)

kept_dir= *dir_name*

A copy (if keep: 1) of the files is sent to "keep_dir".

6.8 Page 8: The "Failed" directory parameters

fail= *flag*

Fail original files flag. If set (=1), the original will be transferred/copied to the "failed_dir" if the conversion fails. (Default value is 0)

failed_dir= *dir_name*

If the "fail" flag is set, files that could not be converted are sent to "failed_dir". (Default value is "C:\DICOM\Failed\")

6.9 Page 9: The "Saved" directories

saved = *flag*

Save converted files flag. If set (=1), converted images are copied to the "saved_dir". (Default value is 0)

saved_dir = *dir_name*

If the "fail" flag is set, converted images are copied to the "saved_dir". (Default value is "C:\DICOM\Saved\")

saved_rename= *value*

Re-Name flag (0/1 flag). If set (name: 1), the converted file's name will be in the form:
  "Exxxx_Syyy_Izzzz.dcm"
xxxx is the study name
yyy is the series number
zzzzz is the image number.

If the acquisition number is not null, "I" will be replaced by a character from "A" (for acq.=1) to "Z" (for acq.=26)
(Default value is 0)

saved_tree= *value*

When saving converted images, the program can create subdirectories for each study/series it encounters. Values can be 0, 1, 2, 3, 11, 12 or 13 (default value is 1) where:
0 = no subdirectory
1-3 = subdirectory for each study
11-13 = subdirectory for each series and each study.
With options 1 or 11, the study directory's name is created from the study ID or study number.
With options 2 or 12, the study directory's name is created from the patient's ID.
With options 3 or 13, the study directory's name is created from the patient's name.
(Default value is 3).

6.10 Page 10: The DICOM Push parameters

AET_snd= *string*

the Application Entity Title of the sender. (Default value is DICOM_Connect)

The program can push images to 4 SCP servers. The following parameters are defined for each of these. Replace "*n*" by 1, 2, 3 or 4.

server_on_*n* = *flag*

Enable (=1) or disable (=0) each of the 4 SCP servers. (Default value is 0)

server_AET_*n* = *string*

the Application Entity Title of the SCP. (Default value is ANY_SCP)

server_peer_*n* = *string*

name of the SCP server' computer. It can also be the URL address of the server. (Default value is "unknown")

server_port_*n* = *value*

Port number used by the SCP. (Default value is 104)

6.11 Page 11: The DICOM Print parameters

dcmpsprt= *string*...   Everything on the line following the "dcmpsprt:" keyword is placed in a character string and is used as optional arguments that are passed on to the dcmpsprt program. (See the dcmpsprt documentation for the available arguments and their descriptions.)

6.12 Page 12: The FTP Push parameters

The program can push images to 4 FTP servers. The following parameters are defined for each of these. Replace "*n*" by 1, 2, 3 or 4.

ftp_out_on_*n* = *flag*   Enable (=1) or disable (=0) each of the 4 FTP push operations individually. (Default value is 0)

ftp_out_server_*n* = *string*   name or URL address of the target FTP server.

ftp_out_port_*n* = value   port used by the FTP server.

ftp_out_username_*n* = *string*   user name used to login in the server.

ftp_out_password_*n* = *string*   password used to login in the server.

ftp_out_path_*n* = *string*   path to the directory where you want to place the images.

WARNING:

The password is not encrypted. Anybody who can read the .ini file will have access to the password information.

ftp_rename= *value*   Re-Name flag (0/1 flag). If set (name: 1), the converted file's name will be in the form:
    "Exxxx_Syyy_Izzzz.dcm"
xxxx is the study name
yyy is the series number
zzzzz is the image number.

If the acquisition number is not null, "I" will be replaced by a character from "A" (for acq.=1) to "Z" (for acq.=26)
(Default value is 0)

ftp_tree= *value*

When creating converted images, the program can create subdirectories for each study/series it encounters. Values can be 0, 1, 2, 3, 11, 12 or 13 (default value is 1) where:
0 = no subdirectory
1-3 = subdirectory for each study
11-13 = subdirectory for each series and each study.
With options 1 or 11, the study directory's name is created from the study ID or study number.
With options 2 or 12, the study directory's name is created from the patient's ID.
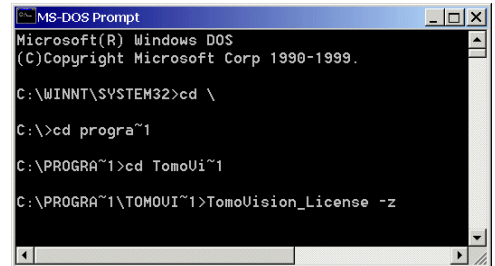With options 3 or 13, the study directory's name is created from the patient's name.
(Default value is 3).

Appendix A: Using command line arguments

You may need to use command line arguments to enable some of the options of a program. There are 3 ways to do this:
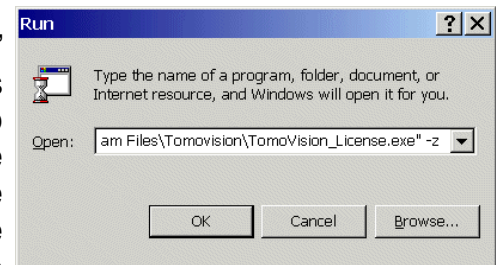
A.1 Start the program from a DOS Prompt

You can type in directly the filename of the executable program, followed by the options, in a DOS Prompt window.


A.2 Start the program from the "Run" window

From Windows "Start" menu, select the "Run" option to open the "Run" window. In this window, you can use the "Browse..." button to browse the file structure until you find the program (by default TomoVision's programs are installed in C:\Program Files\Tomovision). The program's path and name will be placed in the "Open" field. You can then add the arguments you wish to use after the quotes in the "Open:" field (-z in this example).

A.3 Start the program from a shortcut

With this technique, the command line arguments will be present each time you start the program from the shortcut. First, create a shortcut to the executable program by right-clicking on its icon and selecting the "Create Shortcut" option. Then, edit the "Target" field of the shortcut properties by right-clicking on the shortcut and selecting the "Properties" option. Under the "Shortcut" tab, add the arguments after the quotes in the Target field.
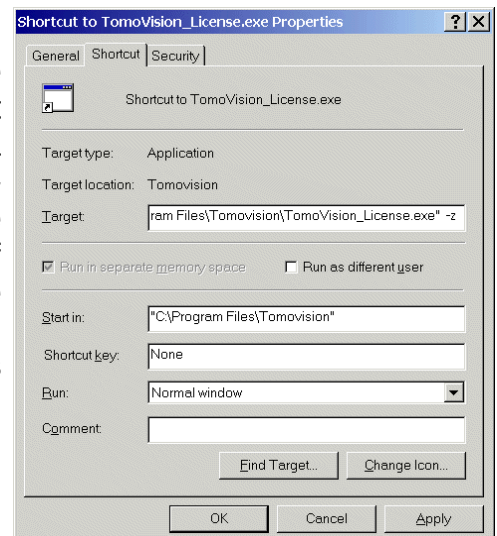
A.4 This module's command line arguments

The available command line arguments for Connect are:

Connect [-t *val*] [-v] [-x *pos dim*] [-y *pos dim*]

where:

-t *val*   Trace mode, val must be between 1 and 5. This will force the program to create a trace file in the scratch directory. This file can be used by TomoVision for debugging purposes. Level 5 generates a much more detailed trace than level 1.

> **Note:**
>
> You can also place the program in trace mode by pressing the control key ("Cntrl") simultaneously with a number key. Key "0" disables the trace, keys "1" to "5" place the program in trace level 1 to trace level 5.

-v   Open a window with the program's version and compilation date.

-x *pos dim* Starting horizontal position and dimension of the program's window.

-y *pos dim* Starting vertical position and dimension of the program's window.

Appendix B: template character replacements

Some fields can accept templates to match one or multiple files. They use a "wild cards" syntax similar to the one used by UNIX:

?   replaces one character
        ex: `toto_?` Will match toto_1, toto_a but not toto or toto_12

*   replaces 0 to many characters
        ex: `toto_*` Will match toto_1, toto_a, toto_12 but not toto

[abc]   replace one character by a, b or c
        ex: `toto_[12]`   Will match toto_1, toto_2 but not toto_a or toto_12

[!abc]   replace one character by any character but a, b or c
        ex: `toto_[!12]`   Will match toto_1 but not toto_1 or toto_2

[a-c]   replace one character by a character from a to c
        ex: `toto_[0-9]`   Will match toto_1 and toto_2 but not toto_a or toto_12

The wild chard will only match a file name or its extension, not both at the same time. So, to match all the files in a directory you need *.*
        ex: *.ima Will match toto.ima but not toto.dat

The wild cards character are only valid in 1 directory. They will not match any directory or sub-directory.
        ex: .\toto*.* will match all the files in the .\toto directory, but it will not match the files in .\toto\sub_dir directory.