VDDS

VERBAND DEUTSCHER DENTALSOFTWARE UNTERNEHMEN E.V.

Interface specification VDDS-media 1.4

Interface for the exchange of multimedia data between the practice management software and the X-ray/camera software

VDDS media

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Glossary/abbreviations:

Image descriptions	Data which describe an image and make it identifiable, e.g. creation date, ID, comment, tooth information; image descriptions are exchanged through the INI-files which are described in the annexes and they are not copies of the pixels of an image
BVS or IPS	Image processing system
ID	Unique identifier (only numeric)
Linux, Unix, Mac OSX	PC operating systems
PVS or PMS	Practice management system
Thumbnail	Small and quickly loadable pictorial preview
VDDS	Verband Deutscher Dentalsoftware Unternehmen e.V. (Association of German Dental Software Companies)

Preliminary notes

In the following the practice management system will be abbreviated with *PMS* and the image processing system (X-ray/camera software, etc.) with *IPS*. The version 1.4 interface will be described.

The documentation refers to the exchange of patient data and image descriptions. Other multimedia objects (video files, sound files, text files) can be included if available.

A main target for the development of the interface was to offer the participating companies and programs maximum customization freedom for the implementation of standardized data exchange which free competition demands.

⚠️ **The maintenance and further development of this interface is exclusively the responsibility of VDDS.**

Scope of services

☑ Patient data are transferred from the PMS to the IPS.

☑ Images/image descriptions (teeth, comments, date/time of creation, image type) and other multimedia objects such as videos, text documents or sound files are transferred from the IPS to the PMS.

☑ The interface is independent of the operating system.

☑ There are no installations which the user need to perform.

☑ Several PMS/IPS can communicate with each other.

☑ Optional integration of an image archive.

Overview of VDDS-media
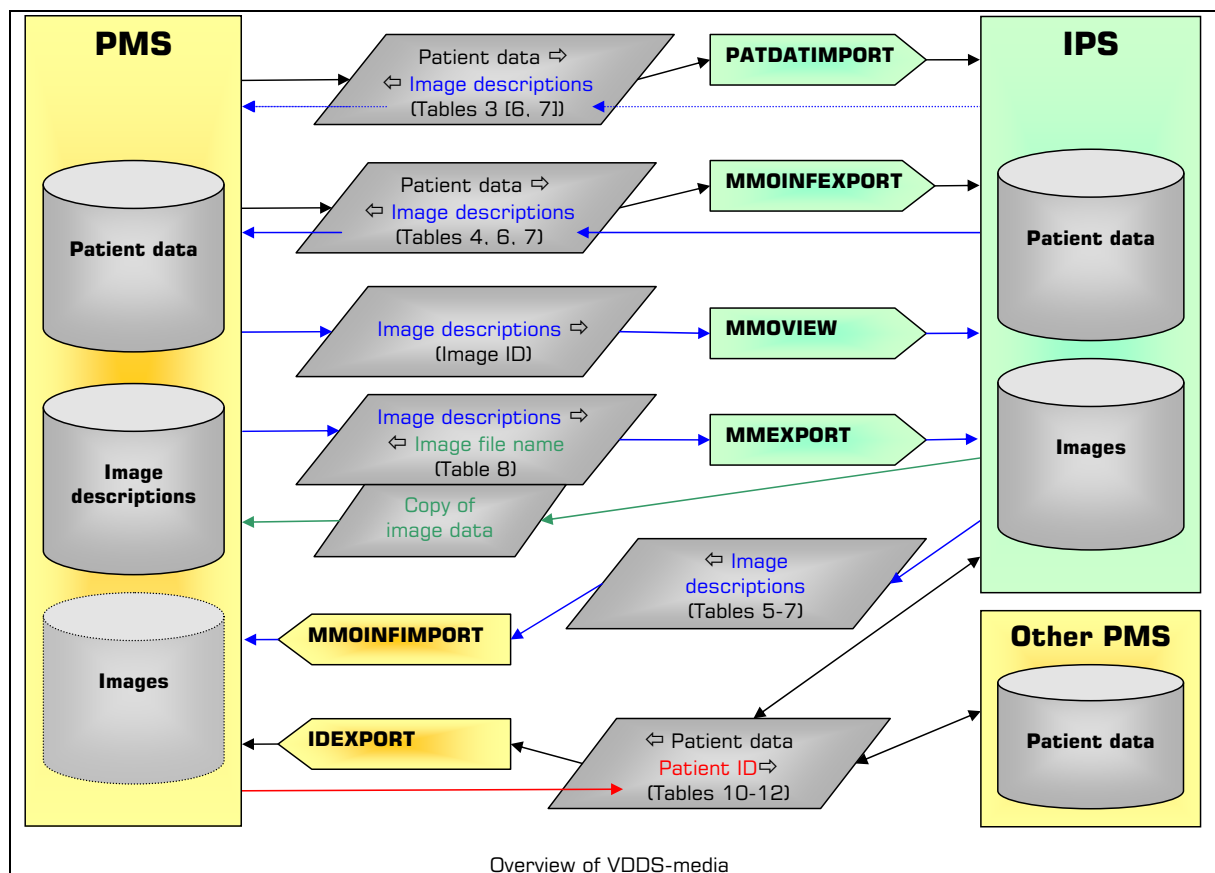
Stages from the PMS view

The PMS features several interface stages:

❑ *Stage 1:*

The PMS invokes the import module of the IPS for the transfer of patient data.
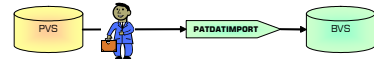
❑ *Stage 2:*

The PMS evaluates the image descriptions fed back in the patient data file.
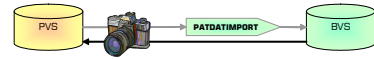
❑ *Stage 3:*

The PMS invokes the module for export of the image descriptions of the IPS.

❑ *Stage 4:*

The PMS invokes the module for image copy export and displays them on its own viewer then.
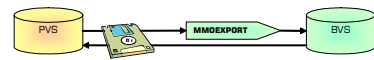
❑ *Stage 5:*

The PMS invokes the viewer of the IPS.
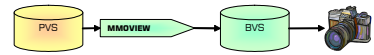
❑ *Stage 6:*

The PMS provides an own module for the import of image descriptions and, if required, also images.
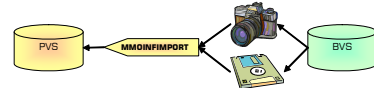
❑ *Stage 7:*

DThe PMS provides a module for patient data export (the PMS is suitable for use as an ID server).
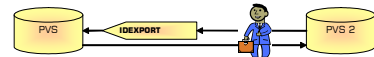
Stages from the IPS view

The IPS features several interface stages:

❑ *Stage 1:*

The IPS provides an import module for patient data.
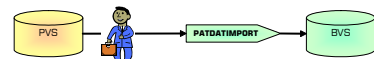
❑ *Stage 2:*

The IPS feeds back the image descriptions in the patient data file.
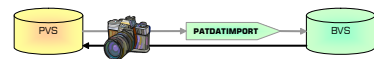
❑ *Stage 3:*

The IPS provides an export module for image descriptions.
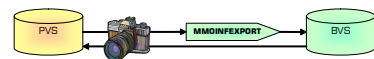
❑ *Stage 4:*

The IPS provides a module for image copy export.

❑ *Stage 5:*

The IPS provides a viewer which the PMS can invoke.
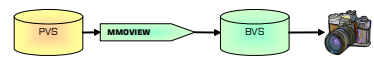
❑ *Stage 6:*

The IPS invokes the import module for image descriptions of the PMS if image descriptions change or a new image is created or selected images are to be transferred to a PMS.
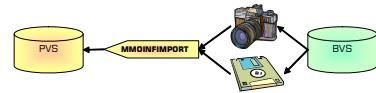
What stages have been implemented the PMS/IPS can see by the entries in VDDS_MMI.INI and invoke the corresponding modules. Since the implementation effort required is not high, it is recommended to perform all stages of the IPS and to perform stages 1, 2, 3 and 6 and, alternatively, stage 4 or 5 of the PMS (see synchronization diagrams in the section 6 on page 18).

General prerequisites

☑ All import and export modules specified here must feed back **0** for successful execution and a value higher than or equal to **1** for errors (a module can supply different error codes for internal purposes and maintenance purposes). The same value must be entered in the field **ERRORLEVEL** in the transfer files. A free text which describes the error (see table annexes) can be entered in the field **ERRORTEXT** of the transfer file in addition if required."

☑ If a system needs just the patient data, only the points given under „Transfer of patient data to the IPS" (section 2) must be fulfilled.

☑ The realization of the import and export modules has to be done by the respective software manufacturer. They can be small independent EXE applications or also the EXE of the PMS/IPS itself. In the latter case the program must decide itself based on the transferred parameter what action is required when it is invoked. To make sure that the call is unique small wrapper EXE-files can be useful.

☑ After the PMS and IPS have been installed no other settings ought to be required for the interface. The PMS should offer the user a choice of the programs entered under VDDS/IPS so that he may decide what interfaces he wishes to activate at the respective workstation. The IPS should offer the user a choice of the programs entered under VDDS/PMS so that he may decide to what PMS the IPS has to feed back its image description. How this choice is created in the IPS/PMS depends on the respective program (e.g. can be configured during the installation or in the program already).

⚠ **When an archive exists, communication must always be done via the archive, i.e. the PMS/IPS invokes just the modules of the archive (see section 5 „Optional integration of an image archive" from page 17**).

☑ In case the modules have to load big database drivers whose load ing times exceed an acceptable level, the modules upon their first invocation must instal a program in the memory which remains there and which executes the commands of the modules. The invocation times of the modules should be less than 1 second on a standard PC.

☑ It must be possible to call the import and export modules in the network from all stations where images are to be viewed or transferred, i.e. the required database drivers have to be installed at these stations as well if the modules need them. Alternatively the import/export modules can communicate via corresponding network protocols with a server program. This means that a server program runs in addition at the station where the IPS is installed. This program processes queries of the IPS import and export modules which are called by the PMS at different stations.

☑ All transfer files (.INI) should be located in a temporary directory on the local computer so that station independence is maintained. If the files are located in the network, it is important that every station assigns them different names. The deletion of the temporary files according to this interface description is done by their respective creator.

☑ Note that several IPS and PMS systems can be installed with several major therapists/practice numbers in a practice. Therefore a PMS must invoke for instance all IPS export modules requested by the user one by one to get all images of a patient unless an archive has been installed. Conversely the IPS must invoke all import modules of the PMS systems requested by the user.

☑ If a PMS is an IPS at the same time, it must provide its multimedia objects also as an IPS. The PMS/IPS must define the respective import and export modules for this and enter them into the VDDS_MMI.INI file (section 1).

☑ If Windows/DOS operating systems are used all used paths must have the short 8.3 notation. Programs for which communication with a DOS program makes no sense potentially or which do not want to communicate with DOS programs can do without this conversion. These programs have to make sure only that they will not address any DOS programs by themselves.

This can be done by an IPS, for instance, which wants to communicate with Windows programs only. It can accept patient data from a DOS PMS nevertheless but it is not capable of returning any image descriptions or images to the DOS PMS then.

☑ As a rule the standard character set selected in the Windows operating system must be used. Latin1 (ISO-8859-1) has to be used for other systems.

☑ Keys are *case-insensitive*.

☑ The communication partners must not lock entirely nor partially nor keep open exclusively the registry file and the transfer files.

1. VDDS configuration file (VDDS_MMI.INI)

In VDDS_MMI.INI all PMS/IPS enter their names and modules. All module entries contain the entire path for calling the module. The configuration file is located in a directory of the operating system which is accessible by all programs.

For Windows this is the main directory of the operating system which feeds back the API function „*GetWindowsDirectory*". (Note: With the Terminal Server 2003 user-specific paths might be supplied for this.) DOS programs may use the environment variables windir, winbootdir or systemroot but they have to make the path to the file editable.

In the case of Linux, Unix and Mac OSX systems the directory /etc/vdds is used. Users of the interface should proceed as follows:

☑ Create a group vdds with the first program to be installed

☑ Create the directory /etc/vdds with the first program to be installed

☑ Create the *VDDS_MMI.INI* file in /etc/vdds with group allocation vdds with the first program to be installed (with access rights 664/ rw-rw-r--: read and write for root, user/group and read only for all others)

☑ Add the users of the program to the group vdds.

1.1. Server 2003, Windows Vista, Windows 7

Microsoft changed the access to the Windows directory of these operating systems. It is no longer allowed that every user writes into the directory. If this is attempted there will be no error message though but the data will be written into a virtual Windows directory instead which is in the user profile of the user. This change has a direct impact on the VDDS-media interface.
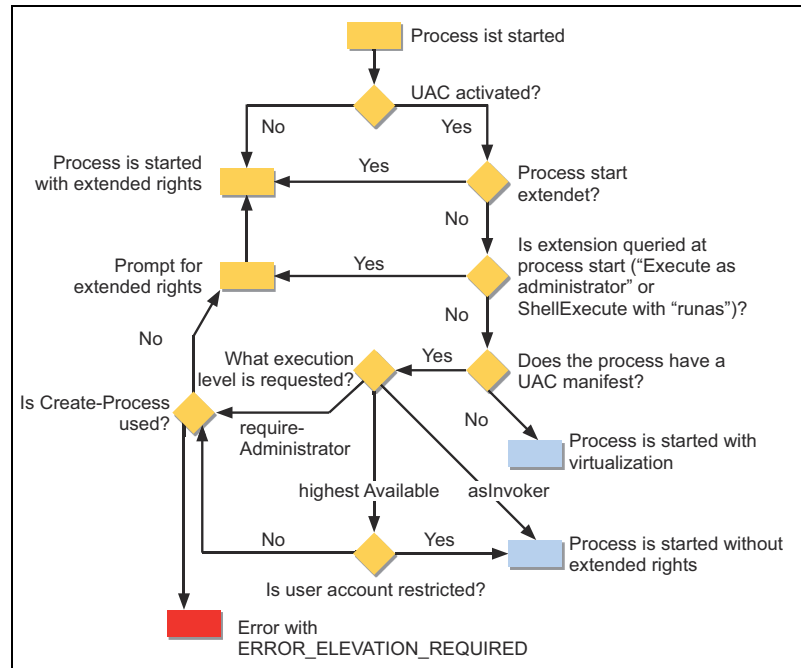
Whether access is made to the real Windows directory or to a virtual one depends on a number of factors and on the system and the software.

Software:

❑ If the program runs with "***Run as administrator***" access will be made to the real directory, otherwise to the virtual directory.

❑ If the program has a special manifest access will be made to the real directory, otherwise to the virtual directory.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<assembly xmlns="urn:schemas-microsoft-com:asm.v1" manifestVersion="1.0">
 <trustInfo xmlns="urn:schemas-microsoft-com:asm.v2">
  <security>
   <requestedPrivileges>
    <requestedExecutionLevel level="asInvoker">
    </requestedExecutionLevel>
   </requestedPrivileges>
  </security>
 </trustInfo>
</assembly>
```

System:

❑ If the user account control has been deactivated access is made to the real directory, otherwise probably to the virtual directory.

❑ If read access is made to the file VDDS_MMI.INI and there is only one file in the real directory this file will be read. But if there is a file in the virtual directory in addition, this file will be read regardless whether there is a file in the real directory.

❑ The virtual directory is created user-specifically. This means that a functioning interface might not be working anymore suddenly because another user logs in to the PC.

Conclusively the interface between two partners can work but does not work necessarily. A general change of the interface (storage of the VDDS_MMI.INI file at a different place or in another form) will inevitably cause a break in the downward compatibility of VDDS-media though.

Therefore the following procedure is agreed: From Version 1.4 every communication partner has to provide in his program directory a file **RegisterVddsMedia.exe** which implements the registration of the program in the VDDS_MMI.INI file. This Exe-file must *not* contain the above manifest.

The file **RegisterVddsMedia.exe** makes it possible that a system administrator can perform a manual registration. If this program is started with the option "*Run as administrator*" the registration will be performed in the real Windows directory. With a normal start the registration is made in the virtual directory (if available).

All programs which support VDDS-media from Version 1.4 should contain the above manifest. Future versions of VDDS-media will require the manifest.

To ensure the compatibility with VDDS-media 1.1 to 1.3 the registration can also be made in the virtual directory with the file **RegisterVddsMedia.exe**. The transfer of the registrations of the other application from VDDS-MMI.INI in the virtual directory into the VDDS_MMI.INI in the real directory must be executed manually.

1.2. PMS entries

For detailed data information refer to „Structure of the VDDS_MMI.INI file - entries of the PMS" (table 1 on page 22).

1.3. IPS entries

For detailed data information refer to table 2 „Structure of the VDDS_MMI.INI file - entries of the IPS" on page 25.

When a PMS/IPS wishes to newly write itself into VDDS_MMI.INI it has to browse the PVS/BVS-Section for an unassigned name ID first and enter its interface data in an own section.

⚠ **The section names should not be abbreviated and they should contain the company and product names (e.g. PRAXISSOFT_WINZAHN) to avoid any nominal identity.**

When a Windows program invokes a DOS module make sure that no DOS window becomes visible unless it is the viewer. This can be ensured by corresponding parameters in the CreateProcess command of the Windows API. See FAQ section on page 20. When a PMS/IPS is deinstalled, all entries of the program must be deleted from the VDDS_MMI.INI file.

Please note:

⚠ ☑ **Since this procedure can cause jumps - NAME2 was deleted and there will be only NAME1 and NAME3 left - a PMS/IPS must not rely on a „continuous" number assignment (to store them, for instance, as a substitute of the section name)!**

⚠ ☑ **If an IPS should have set its PVSLIMIT entry, it will be locked for the VDDS-media interface if the PMS no longer exists. Although other PMS do not communicate with it, the IPS should display a note in such a case. The patient numbers must never be assigned to another PMS! In such a case the IPS manufacturer should transfer the data to an external storage and perform a new configuration.**

2. Transfer of patient data to the IPS

The PMS invokes an import module provided by the IPS which is passed the patient data transfer file as a parameter. The import module creates the patient anew or updates the data in the patient database of the IPS. After that the import module starts the IPS unless it has already been loaded and activates the transferred patient unless there is the parameter **INFO=1**.

The transfer file is managed by the PMS, has the format of a Windows INI file and should be located in a temporary directory on the local hard disk.

PMS	IPS
• Create INI-file • Create **Table 3** • ERRORLEVEL=0 • READY=0	
Call module: PATDATIMPORT by IPS from VDDS_MMO.INI	Apply patient data
Wait for processing	INFO=1 — No / Yes
• Apply image descriptions and thumbnails, if applicable • Delete INI-file	Display IPS window and activate the transferred patient
	MAKEMMOS=1 — Yes / No
	PVSIMP=1 — Yes / No
Create new INI; generate **Table 5** from the [PATIENT] section, enter image descriptions (**Table 6/7**) and store thumbnails, if applicable	Write image descriptions into transferred INI (**Table 6/7**) and store thumbnails, if applicable
Call module: MMOINFIMPORT by PMS from VDDS_MMO.INI	Set READY=1

Transfer of patient data by PMS to IPS

2.1. Transfer file

For detailed data information refer to „Transfer of patient data from the PMS to the IPS" (table 3 on page 29).

The following keys are filled only if an immediate transfer of the image descriptions of the patient is desired. If the key **MAKEMMOS** is set to **1** the PMS requests descriptions of any stored images of the patient immediately after the IPS has finished or it waits for an image to be taken.

Before it is terminated, the IPS will enter the image descriptions into the patient data transfer file in the form as described in table 6 on page 13 and table 7 on page 41.

❑ **MAKEMMOS=0**
Request of direct image creation/descriptions (**1=yes**)

❑ **DATE=20010501**
Transmit image descriptions of all images including and from this date (in the format *CCYYMMDD*, „SELECT" or „NEW" according to section 3.1 on page 13 or all images, if empty)

If the PMS wants to only communicate the patient data to the IPS without starting it and without activating the patient (info mode), the following key can be used:

❑ **INFO=1**

Info mode (**1=yes**): the IPS only updates the data but does not start

If the PMS also wants thumbnails together with the image descriptions - provided that the IPS supports this (**SUPPORTTHUMBNAILS=1** in the IPS section) - the following keys can be used:

❑ **THUMBNAILS=1**

Requesting thumbnails together with image descriptions

❑ **THUMBNAILSX=320**

Desired maximum width of thumbnails in pixels (unless specified, the IPS may select it)

❑ **THUMBNAILSY=200**

Desired maximum height of thumbnails in pixels (unless specified, the IPS may select it)

In the thumbnails the IPS must maintain the image proportions and create a Windows BMP file with a 24-bit color depth (see section 3.2 on page 13). Image descriptions may also be returned via this hidden path (MAKEMMOS=1) whereas orders must not be transferred to the IPS. DATE=NEW and DATE=SELECT are not permitted.

☑ Before the PMS enters the data into the patient data transfer file it has to delete it to avoid that „old" data of previous patients are kept if the new patient does not fill all fields.

☑ The field lengths (except the section names and patient number) are not defined, i.e. the PMS writes as many characters in a key (e.g. STREET) as exist and the IPS accepts as many as it can store.

☑ The name of the PVS-Section must also be passed to ensure that in a system with several PMS the IPS can distinguish the patients despite the same PATID. If the IPS does not store the name of the PVS-Section with a reference to the patient, it cannot be used in a system with several PMS. The PMS are informed about this with the entry **PVSLIMIT** in the BVS-Section of the VDDS_MMI.INI file.

☑ When an archive is used, the entry **[Patient]->BVS** must always contain the section name of the desired IPS unless communication with the archive is desired. By default the import module of the archive is invoked though.

☑ In case of an error the import module of the IPS displays the corresponding error message and generates an error code for the **ERRORLEVEL**. A free text for error description is entered in the field **ERRORTEXT** of the transfer file if required ((see table annexes).

☑ After the patient data transfer file has been read in and the data has been processed, the IPS must set the **ERRORLEVEL** and the READY flag both in the system and in the transfer file. Note that the setting of the READY flag has always to be the last action.

☑ In the installation under Windows the IPS enters the complete path name of the import module into the VDDS_MMI.INI file (see section 1 on page 6).

☑ If the import module is actually the IPS software, it should accept and activate the patient by default. If this is not possible because it is presently in a creation mode for instance which cannot be interrupted, it must reject the call with **ERRORLEVEL>0**.

☑ In the info mode the IPS merely stores the patient data without starting and activating the patient. In this way changes to patient data can be communicated to the IPS (without the user noticing or being disturbed by it).

2.2. PATID server

Dental practices nowadays run more and more software products parallelly. Most of them refer to the patient data. The unique patient identification within the entire practice is a necessary prerequisite for the successful and safe interaction of the individual components. Since usually any software assigns the patients individual numbers, a central compensation has to be performed. To this end a PMS must be declared the ID server. This PMS must provide an additional functionality by which a unique patient identifier which is used throughout the practice is communicated to the other communication partner..
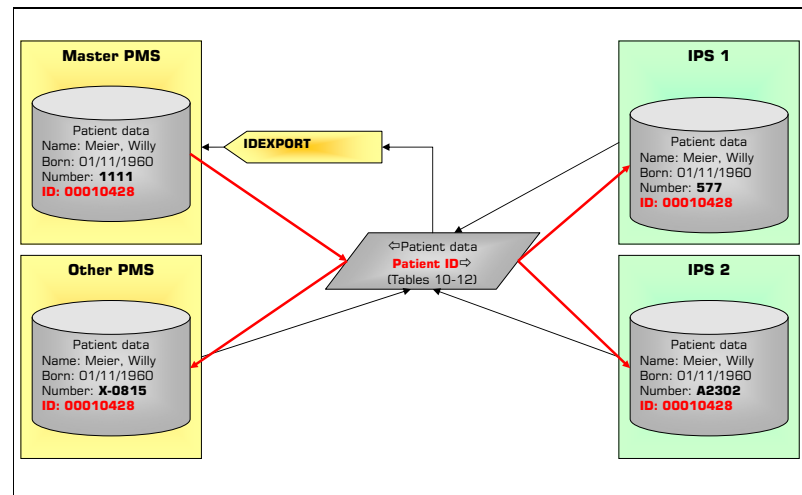
The patient number of the PMS cannot be used in all cases since some KFO PMS provide the option to assign patients different numbers during the treatment. Therefore the entry **PATSHOWNR** was introduced to distinguish the number from the identifier. When in the PMS the number gets a fixed assignment and will not be reused after a patient was deleted, it may be used as the identifier of course.

When an ID server is used, a reference must be made to the ID server via the entry **FROMPVS** during communication.

The ID server must provide an **IDEXPORT module** which can be called by any interface user. The **IDEXPORT** module contains an INI file as a parameter (table 10 on page 47).

3. Transfer of the image descriptions to the PMS

There are three ways for transferring the image descriptions:

❑ With the transfer of the patient data from the PMS (see section 2.)

❑ Invocation through the PMS (described here)

❑ Via the import module of the PMS (see sections 3.3 and 4.3)

The PMS nvokes an export module which is provided by the IPS and to which the name of the image transfer file is transferred as a parameter. This file contains the PATID and a date or the desired mode when it is called. The export module stores in this file any image descriptions of the images now which were added or modified after the transferred date or due to the selected mode. The following rules apply to the date and the mode:

1. A date must be tranferred in the format *CCYYMMDD*. The IPS is to send information to all images then which were created or modified on or after the specified date. This function is mandatory.

2. If the date is empty, the image descriptions of all images will be transmitted. This function is mandatory.

3. If the entry at the date is „NEW", the IPS is to permit the user to create new images directly. The IPS is to supply descriptions only for these new images or no descriptions if the user aborted the process. This function is optional.

4. If the entry at the date is „SELECT", the IPS is to allow the user to select an indefinite number of patient images from those that are already existing. In this case only the descriptions of the selected images are to be sent to the PMS. Additionally text can be added to the **SELECT** command after a slash which can be used as title for selection (e.g. „expert selection"). The **SELECT** function is optional, the title specification / evaluation is optional for **SELECT**.

The PMS has three options for detecting the termination of the IPS export module:

1. The PMS polls to the **READY** flag until it is set to **1**.

2. The PMS sets the **PVSIMP** flag to **1** and continues its execution. The IPS will then call the PMS import module for image descriptions automatically. To make sure that the IPS really understood the commands, it should wait for the **READY** flag though and evaluate the **ERRORLEVEL**, particularly with regard to the SELECT and NEW commands which can optionally be supported by the IPS.

3. When the module defined an EVENT in VDDS_MMI.INI, the PMS can wait for it after the module call (the PMS gets a handle for this with OpenEvent from the OS and waits with WaitForSingleObject then. This call supplies `non-signaled` as long as the module is running and `signaled` when it has finished. Finally, CloseHandle needs to be done).

Overview diagrams of synchronization are given in section 6 on page 18.

After the export module has been terminated, the PMS or the PMS import module reads out the image transfer file and imports the data into its own image database.

Invoking of image descriptions by PMS from IPS
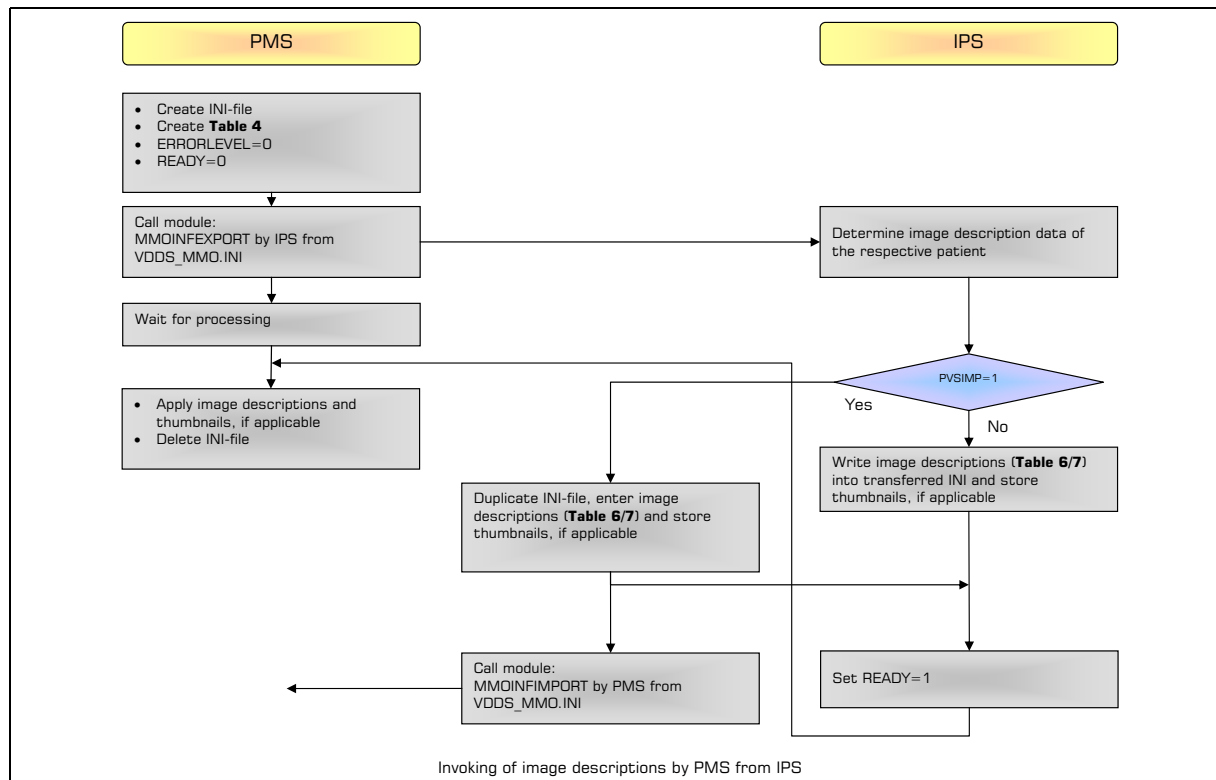
3.1. Transfer file of the PMS to the IPS

The image description transfer file has a Windows INI file and should be stored in a temporary directory on the local hard disk. It is created by the PMS and, when the IPS is called, it contains the data that were entered by the PMS.

Detailed data information is given in the table 4 on page 34.

3.2. Transfer file of the IPS to the PMS
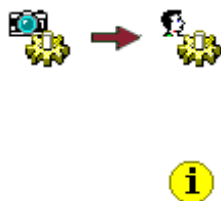
The image descriptions are returned in the same file which also contains the inquiry data (section 3.1). This may be a stage 2 requirement according to table 3 or a stage 3 requirement according to table 4. They are not deleted but the IPS adds its image descriptions according to the table 6 and 7 to this file. With the entry **[MMOS]->COUNT** the PMS gets the number of returned images. The image descriptions are given in sections with constant names (**MMO1, MMO2, MMO3,** …)..

The structure of the image transfer file after the IPS export module has been called with the data of two images is given in the table 6 on Seite 40 and table 7 on page 41.

☑ During the installation the IPS enters the complete path name of the export module for the image descriptions into VDDS_MMI.INI (section 1, on page 6).

☑ The IPS assigns every returned image an image identifier (max. 200 alphanumeric characters) by which a copy of the image can be requested later. If the IPS does not have any image identifier, the file name and path of the image can also be used as an alphanumeric image identifier as far as it is unique and it does not have more characters than 200. The PMS will not evaluate it as a path but store it as an alphanumeric character string instead by means of which an image copy can be requested later.

☑ Before the PMS enters the data into the image transfer file, it has to delete it if it already exists. This has to be done to ensure that no „old" data are kept from previous patients.

☑ Under EXT the extension of the object is entered. So far 4 object types are available for transfer :

❑ TIF, JPG, PNG and DCM for images

❑ AVI for videos

❑ WAV forr sound files

❑ DOC, DOCX and PDF for documents

❑ STL and OBJ for 3D data

Several types in images can be written separated by commas if the IPS supports several types. The PMS imports only those objects which it wants to manage itself.

☑ When the IPS wants to inform the PMS that an object was deleted, it has to set the key **TYPENR** to **0** for „DELETE". The remaining fields, except **MMOID,** can remain empty then. This functionality is possible only in connection with the PMS import module which is called when an image is deleted. Therefore all PMS should provide such an import module or implement stage 6 (see section page 4 „Stages from the PMS view").

☑ When the thumbnails (thumbnail files) are created, the IPS must maintain the proportions of the image and provide it as Windows BMP file or JPG-file with a 24-bit color depth. In the case of document formats (AVI, WAV, DOC) which cannot be displayed directly as individual images a corresponding standard bitmap must be provided. The deletion of the provided thumbnail files is done by the PMS.

3.3. PMS import module for image descriptions

The PMS has in addition an import module to import the image description transfer file according to table 5,6 and 7 on pages 38 - 41. The IPS invokes the import modules of the PMS which the user has specified (see section page 4 „Stages from the PMS view") when the image descriptions have changed or a new image was added. This serves to maintain the image descriptions in the PMS always current or to be informed about deleted objects.

When a PMS got information already from the synchronous call (**MAKEMMOS=1** in section 2.1. page 9, the IPS need not „inform" this PMS again.

The PMS import module is called with the image description transfer file (table 5,6 and 7 on pages 38 - 41) as a parameter and sets the **ERRORLEVEL** and the **READY** flag then. In the case of an error the import module outputs the corresponding error message and may propose to repeat the action to prevent losing images particularly when the optional image archive is used.

If the PMS also requests thumbnails (**WANTTHUMBNAILS=1** in the PVS-Section), the IPS has to create them if the IPS can also do this (**SUPPORTTHUMBNAILS=1** in the BVS-Section). The PMS is responsible for the deletion of the images.

The IPS can also transfer image copies immediately to the PMS in this way. The PMS must show its readiness for accepting images in the VDDS_MMI.INI with the entry **DIRECTIMAGEIMPORT=1**. During the installation the PMS enters the complete path name of the import module for the image descriptions into VDDS_MMI.INI (section 1. page 6).

The call of all existing PMS import modules through the IPS is a mandatory function of the IPS. If an archive is installed, the IPS calls only the import module of the archive and the archive sends the new image descriptions to all existing PMS (see section 5. from page 17).

Automatic transfer of image descriptions from IPS to PMS
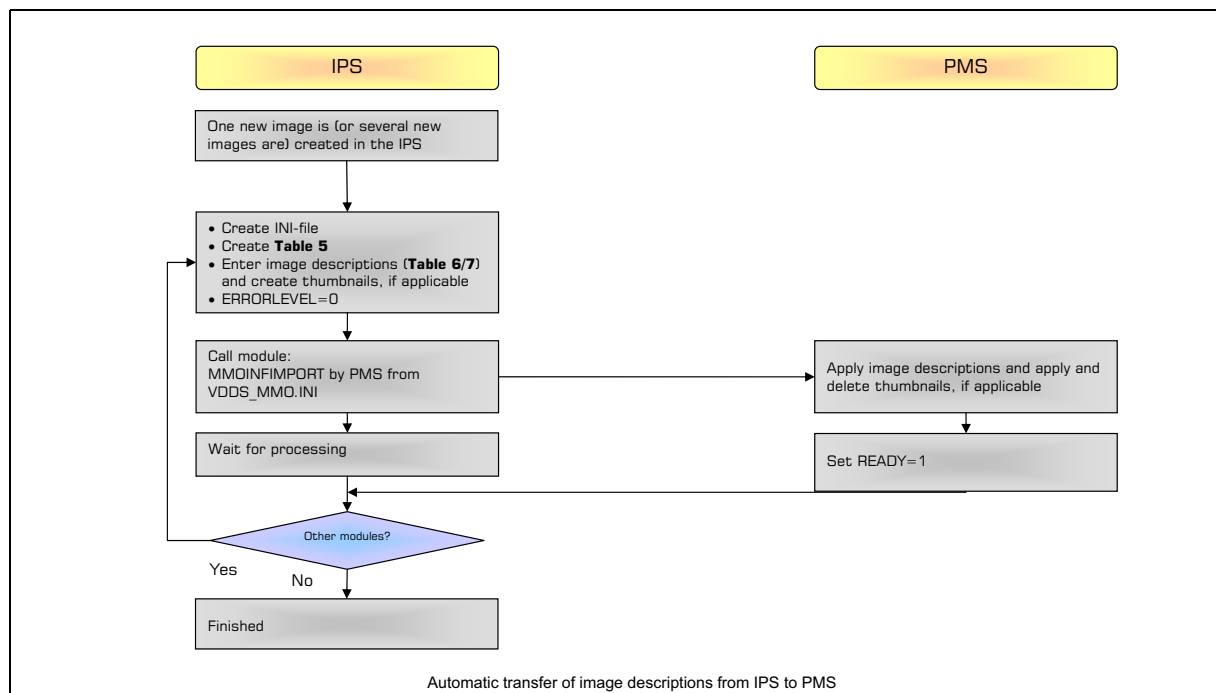
4. Image transfer/display

The image transfer/display is done with the PMS or IPS viewers.

Transfer of images from IPS to PMS
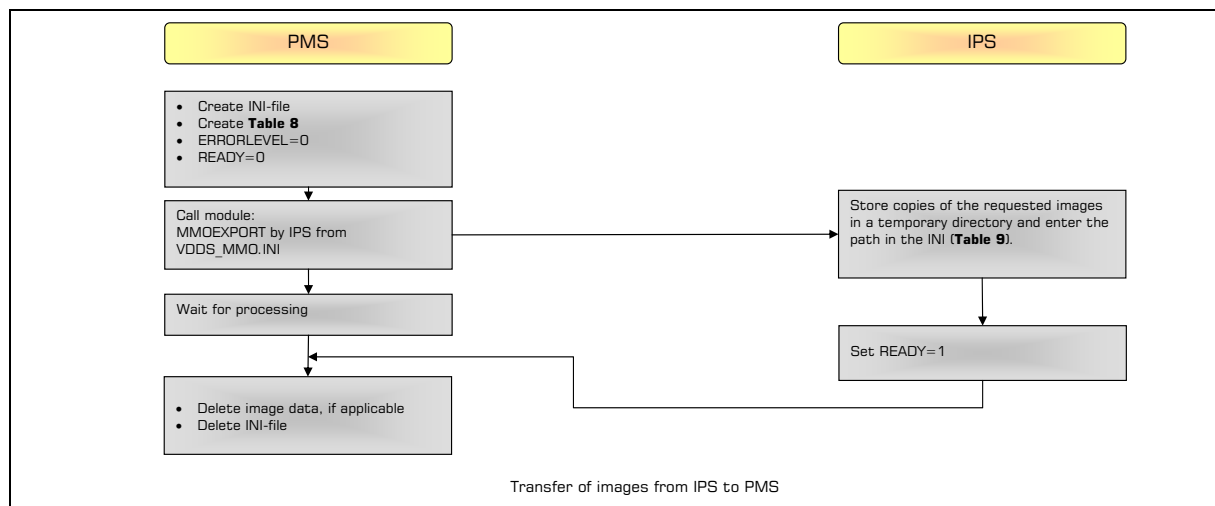
4.1. Image display with the PMS viewer

The PMS calls an export module which is provided by the IPS (table 2 „Structure of the VDDS_MMI.INI file - entries of the IPS", page 25) and to which the image transfer file is returned. The PMS enters the image identifier of all desired images into the file when the module is called.

For detailed data information refer in the table 8 on page 44.

The PMS has two options to detect the termination of the IPS export module:

1. The PMS polls to the READY flag until it is set to **1**.

2. When the module has defined an EVENT in VDDS_MMI.INI, the PMS can wait for it after the module has been called (with OpenEvent the PMS gets a handle from OS for this and waits by WaitForSingleObject then. This call supplies `non-signaled` as long as the module is running and `signaled` when it has finished. Finally, *CloseHandle* needs to be done).

Overview diagrams of synchronization are given in section 6 on page 18.

In the case of an error the export module outputs the respective error message and sets **ERRORLEVEL** to the error value and the entry **[MMOIDS]->COUNT** to **0** to inform the PMS about the error.

The copies of the images must be delivered by the IPS in one of the formats requested by the PMS. The standard format is TIFF according to the table 13 on page 52.

The color depth must not be higher than given in the entry **COLORDEPTH/ GRAYSCALE** (see also table 15 on page 54). Any modifications, e.g. in intensity, contrast, mirror reflection, etc. must be contained. The PMS shows this image now with its own viewer. The image copies will not be stored by the PMS but merely used for display and deleted then.

If the archive requests the images (**PVS-Section=PVS_ARCHIV**), the IPS can also supply unmodified originals. The archive should not delete any images.

When thumbnails are created (thumbnail files) the IPS has to maintain the image proportions and provide them as a Windows BMP file or JPG-file with a 24-bit color depth. In the case of document formats (AVI, WAV, DOC) which cannot be displayed directly as individual images a corresponding standard bitmap must be provided. The deletion of the provided thumbnail files is done by the PMS.

During the installation the IPS enters the complete path name of the export module for the images into VDDS_MMI.INI (section 1. page 6).

4.2. Image display with the IPS viewer

The PMS calls a viewer which is provided by the IPS and to which the image identifier is transferred as a parameter. It will do the display as an independent program. The viewer may also be the actual IPS which activates the patient belonging to the image and which shows the image. If and how the viewer/IPS permits the user the selection of further images or functions in addition, remains up to it. In the case of an error the viewer displays the respective error message. Error feedback to the PMS is not included but it can be carried out via **ERRORLEVEL** of the viewer module. The viewer module can also be terminated in particular as soon as the patient has been activated.

During the installation the IPS enters the complete path name of the viewer into VDDS_MMI.INI (see section 1. page 6).

4.3. Transfer of selected images from the IPS to the PMS

Sometimes it can be more favorable to transfer selected images from one IPS to another program instead of requesting them from the IPS from out of another program. If there are a lot of images in the IPS and only some of them are to be evaluated specifically this approach will serve the normal situation in a practice better. The dentist sees his images in the IPS, selects an image in the image preview there and wants to evaluate this image with other software.

The PMS import module is used for this purpose. The IPS transfers the image descriptions to the PMS import module on its own. In order that this works the PMS must signal in the VDDS_MMI.INI that it is capable of accepting images in this way (**DIRECTIMAGEIMPORT=1**). The PMS import module recognizes the direct image transfer by the entry **IMAGEDATA**. If this entry exists the PMS can accept the image data directly and it also handles the deletion of the temporary image copy. If an image contains the entry **ACTIVATE=1** this image must be displayed in the PMS after it has been accepted which implies that the respective patient might have to be activated.

Transfer of selected images from IPS to PMS
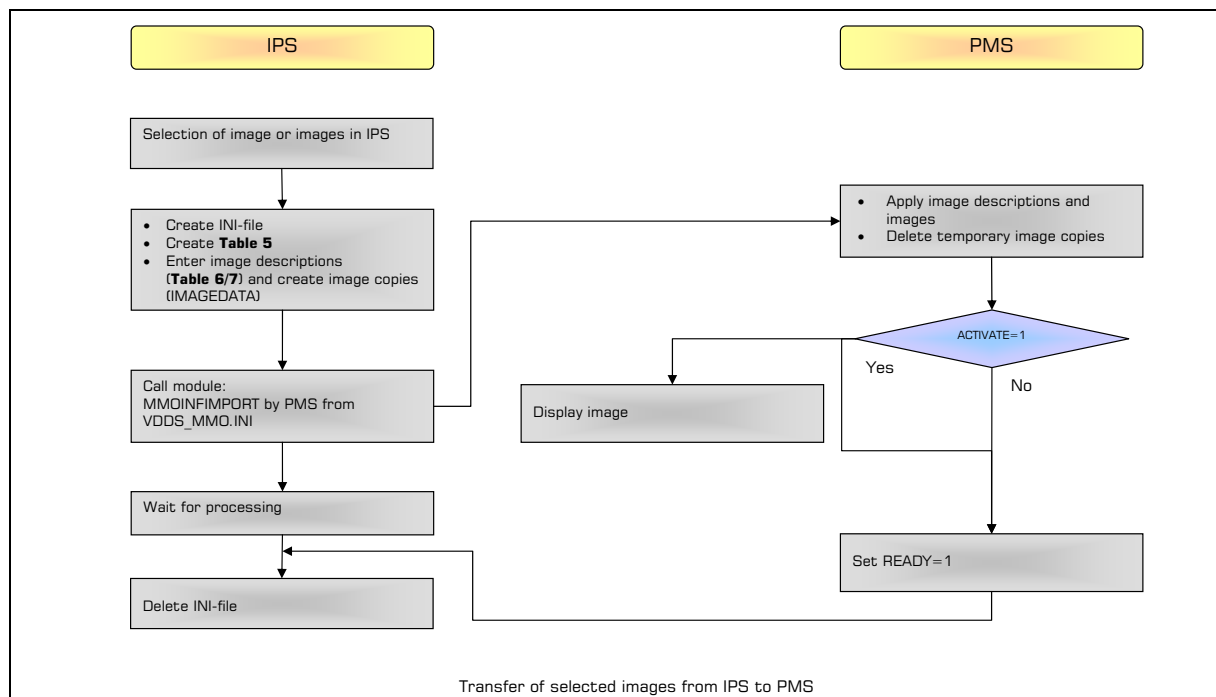
5. Optional integration of an image archive

The image archive is a program whose job is the central management of the patient data, original images and documents of all PMS/IPS which communicate via the VDDS-media interface.

The archive performs the backup and loading of the images. It gives the user the option to retrieve and view all images and documents of a patient even if they come from different IPS. If an image archive has been installed, the PMS do not communicate directly with the IPS or vice versa any longer but all users exchange data only with the image archive.

5.1. Logon of the archive/ communication model

During the installation the archive logs on to VDDS_MMI.INI like a PMS and an IPS. It must have implemented all stages of the PMS/IPS although a corresponding IPS should provide the original images for the PMS stages 2 and 4 to avoid double backups. The archive can then be considered the ID server of this IPS because a PMS gets the **MMOIDS** of the archive but stores them under the names of the IPS.

The creation and evaluation of the transfer files is done as defined before but finally the IPS/PMS has to call the corresponding module of the archive instead that of the PMS/IPS. Therefore as a rule an IPS is called by a PMS or vice versa via the archive. The archive will forward the data if required.

Except for the use of other modules, the use of the archive is entirely transparent to the PMS/IPS with this, if desired. However the PMS/IPS can also address the archive directly via the **ARCHIV-Section**.

5.2. Transfer of patient data to the archive

The PMS creates the transfer file as described in section 2.1 page 9 and calls the import module of the archive. The archive stores the patient data together with the section name of the calling PMS in its own database. By the **[PATIENT]->BVS** entry the archive knows which images of which IPS are desired, which IPS import module has to be called then or which IPS is to create a new image.

Since the archive also functions as an IPS, it can also be addressed directly itself. If, for instance, a PMS sets the **[PATIENT]->BVS=ARCHIV-Section** value during the simple transfer of patient data, this would be a search request for all stored documents of the patient.

5.3. Transfer of the image descriptions to the archive and the PMS

The PMS creates a transfer file as described in section 3.1 on page 13, but then it calls the export module of the archive and will then get back from the archive the image descriptions of the patient's images of the transferred IPS as described in section 3.2 on page 13. To ensure the transparency mentioned above, the archive must not feed back the descriptions of all images of all IPS, but only the descriptions of the IPS entered under **[PATID]->BVS**. If the PMS wants to get all images of all IPS of a patient, it must either:

❑ Create transfer files for all IPS, although it actually only calls the export module of the archive. For safety reasons the archive should forward the PMS inquiry to the IPS in addition to ensure that it really gets all image descriptions.

or

❑ Address the archive directly via the **ARCHIV-Section**.

The archive should also check whether it has already received the original images of all the fed back image descriptions.

5.4. Archive import module for image descriptions

The archive has to make sure that the image descriptions which it uses are always the most current. For this purpose the archive has to provide the import module described in section 3.3 on page 14 to all IPS. The archive should also check whether the original images of all the fed back image descriptions are already available.

When this module is called by an IPS, the archive has to request and archive the corresponding image immediately. The archive gets the original files of the IPS if possible. If it is a new image, the archive will request it for archiving immediately as described in section 4.1 on page 15.

5.5. Transfer and display of images with the viewer of the PMS

The PMS invokes the export module of the archive as described in section 4.1 page 15. The archive will provide the desired images then, if necessary, by forwarding the inquiry to the IPS.

5.6. Display of images with the viewer of the IPS or archive

The PMS calls a viewer provided by the archive to which the image identifier is transferred as a parameter. If the archive does not possess its own viewer, it will call the viewer of the IPS. If the archive possesses its own viewer, it will display the image itself.

6. Synchronization of the processes

The synchronization of the processes is an important part of the interface. The different behavior of the individual Windows versions requires to have a closer look at this part.

6.1. Communication without event

It is recommended to use a timer because it will work under all circumstances. If the end of the module is waited for, the calling application has to make sure that the module gets sufficient computing capacity so that an end can be reached at all. An improper implementation can slow down the reaction time of the interface considerably.

When the module is called, you get a process handle under Windows. Theoretically you could wait until this handle is fired to detect the end of the other process. However this is risky because the called module can create and call another process itself and terminate itself before the end of the actual module. This is not an odd case, the registered EXE of the module calls the actual application with the respective parameters.
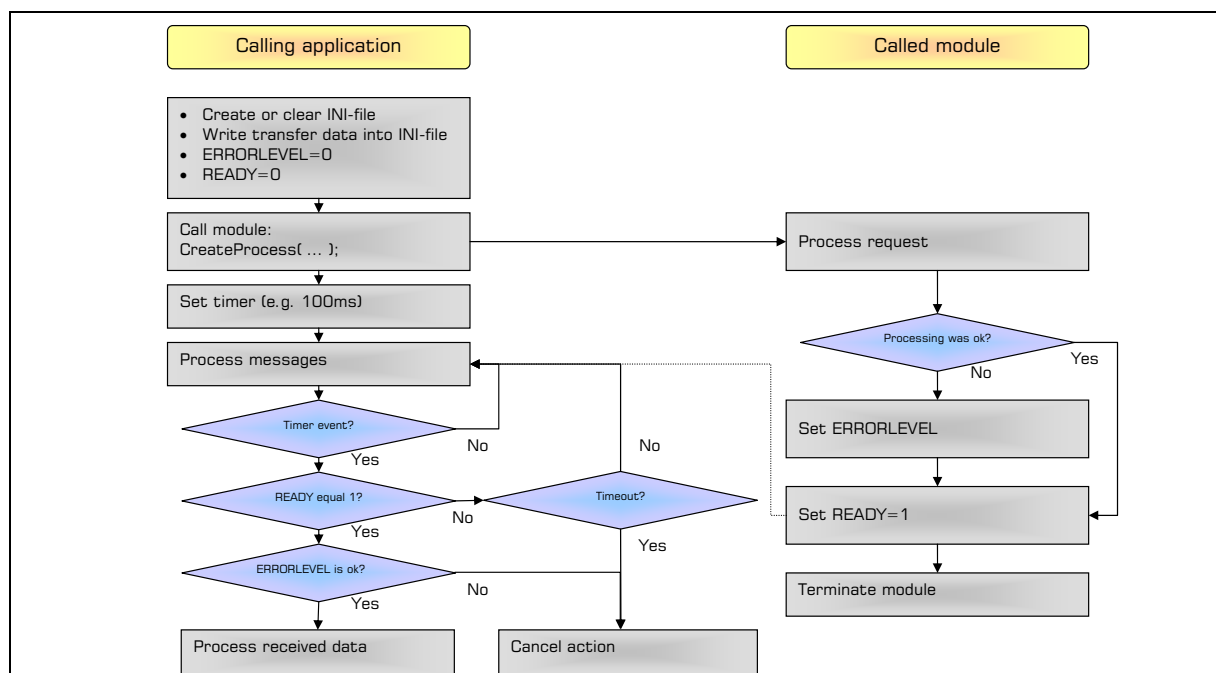
DOS applications tend to play a less important role. However when they occur, care must be taken. DOS processes need permanent message bumping, i.e. the time of the timer must set shorter and active messages have to be passed on with TranslateMessage and DispatchMessage.

Synchronizations by means of WAIT functions should be done with MsgWaitForMultipleObjects as a rule. WaitForSingleObject can make the interface get stuck if the called module creates its own windows which the interface does not forbid.

6.2. Communication with event

The option of events should be used under Windows. With events the called module can inform the calling application that it has finished processing without the calling application having to poll to the READY flag.

The event has to be created by the calling application before the module is called. Otherwise the synchronization could fail because the calling application scans the event at a time before the module creates it.

The synchronization should be done with MsgWaitForMultipleObjects as a rule. WaitForSingleObject can make the interface get stuck if the called module creates its own windows which the interface does not forbid.

DOS applications tend to play a less important role. However when they occur, care must be taken. DOS processes need permanent message bumping, i.e. the time of the timer must set shorter and active messages have to be passed on with TranslateMessage and DispatchMessage.

Synchronizations by means of WAIT functions should be done with MsgWaitForMultipleObjects as a rule. WaitForSingleObject can make the interface get stuck if the called module creates its own windows which the interface does not forbid.

7. FAQ

❏ *IPS is no IPS*

There are programs now which implement VDDS-media only for the transfer of patient data. For this purpose these programs identify themselves as IPS. However this can result in an „impaired" communication where error messages are created because of unavailable image data. Such programs should implement at least version 1.2 of the interface and set the entry „**STAGES=1**" then so that „real" VDDS-media programs can control the workflow for these „illegal" IPS in a customer-friendly way.

❏ *May a PMS enter its patient data export module into the VDDS_MMI.INI file at all if another ID server already exists?*

A PMS may enter its patient data export modules into the VDDS_MMI.INI file of course, even if another PMS is already the ID server. It must not change the **IDSERVER** entry without requesting this of course!

❏ *Why does the interface description completely ignore network functions?*

The interface describes only local communication. However every user has the option to configure network functions by means of the modules. In this way a patient data import module of an IPS which was started locally could also activate the data transfer or acquisition of image data on a „remote" computer of course.

❏ *Why is the entry* **THUMBNAILS=1** *found in the VDDS_MMI.INI file and as* **THUMBNAILS=1** *in the transfer files too?*

When a patient import module of an IPS is called, the PMS must be able to indicate explicitly whether or not it wants to have thumbnails for this concrete call (section 2.1 on page 9 and 3.1 on page 13). The entry in the VDDS_MMI.INI file actually merely serves for information of the IPS whether the import module of the PMS wants to have thumbnails too (section 3.3 on page 14). It may be the case that this is written only in the VDDS_MMI.INI file because the IPS might not have had any contact with the PMS before. So if a PMS does not want to have any thumbnails via its own import module it may skip the entry in the VDDS_MMI.INI file and still request thumbnails in the case of direct IPS calls analogously to 2.1 on page 9 and 3.1 on page 13.

❏ *How can the black windows be suppressed when a DOS application is called from a Windows application?*

```
PROCESS_INFORMATION PrInf;
STARTUPINFO         StartInf;

    ZeroMemory(&StartInf, sizeof(STARTUPINFO));
    StartInf.cb=sizeof(STARTUPINFO);
    if (IsDos) {
      StartInf.dwFlags=STARTF_USESHOWWINDOW;
      StartInf.wShowWindow=SW_HIDE;

    if (CreateProcess(NULL, lStr, NULL, NULL, FALSE,
      IsDos?DETACHED_PROCESS:CREATE_NEW_CONSOLE, NULL, NULL, &StartInf,
      &PrInf  {

…

      if (PrInf.hProcess) {
        CloseHandle(PrInf.hProcess);
        CloseHandle(PrInf.hThread);
      }
    }
```

❏ *The path of the own software contains blanks. Is it necessary to create a separate directory in 8.3 notation for the VDDS coupling?*

No. It is only necessary to use the 8.3 notation for any registrations. For this purpose the following Windows API call has to be used:

```
DWORD GetShortPathName(LPCTSTR lpszLongPath, LPTSTR lpszShortPath,
                       DWORD cchBuffer);
```

In this way a path with long file names can be converted into 8.3 notation.

Table 1

Structure of the VDDS_MMI.INI file - entries of the PMS

The VDDS_MMI.INI file has a Windows INI-file format and is located in a Windows directory on the PC. The file is created by the program which is installed first; all programs which are installed later add to the data of the file. Each program handles its own entries.

Entry	Explanation	Specification	Example	Interpretation if missing
[PVS]				
NAME1=	Section name of the PMS (max. 30 characters)	Mandatory	NAME1=PMS1	
NAME2=	Section name of the PMS (max. 30 characters)	Mandatory	NAME2=PMS2	
IDSERVER=	Section name of the PMS which handles the central management of the patient data (max. 30 characters). This registration has to be done by the system administrator. The set program must support the functionality of the ID server.	Optional	IDSERVER=PMS1	
[PVS1]	The entry in the square brackets must comply with that in **NAME1**. Every further registered PMS gets its own section.			
NAME=	Name which is to be used for display at the communication partner	Mandatory	NAME=management system	
VERSION=	Interface version of VDDS-media supported by the PMS	Mandatory	VERSION=1.4	
STAGES=	Specification of the VDDS-media stages supported by the PMS (ascending order)	Mandatory	STAGES=12345678	
MMOINFIMPORT=	Complete path of the PMS import module for image descriptions (for DOS compatibility short 8.3 paths, parameters are not permitted)	Recommended	MMOINFIMPORT= C:\PROGRAMME\IMPORT.EXE	

Table 1   Interface specification VDDS-media 1.4

MMOINFIMPORT_OS=	Operating system of the module: **1** – Windows **2** – DOS **3** – UNIX/LINUX	Recommended	MMOINFIMPORT_OS=1	
MMOINFIMPORT_EVENT=	Name of an event which is fired by the communication partner when it has finished the processing (max. 60 characters)	Recommended	MMOINFIMPORT_EVENT= IMPORT_EVENT	
WANTTHUMBNAILS=	This flag shows that the PMS also requests thumbnails when the import module is called.	Optional	WANTTHUMBNAILS=1	WANTTHUMBNAILS=0
THUMBNAILSX=	These data limit the size of the provided thumbnail. Unless specified, it will be defined by the IPS. One of the two values, both or none can be specified. If width and height are restricted, the IPS must ensure that the height/side ratio of the respective image is maintained and the value with the stronger restricting effect is applied for the reduction.	Optional	THUMBNAILSX=320	
THUMBNAILSY=		Optional	THUMBNAILSY=200	
DIRECTIMAGEIMPORT=	This flag shows that the PMS can also immediately accept image data at the call of the import module (for STAGE 8).	Optional	DIRECTIMAGEIMPORT=1	DIRECTIMAGEIMPORT=0
COLORDEPTH=	These two values show the maximum color depth for colored and grayscale images which the PMS can process upon the direct image import via the import module.	Optional	COLORDEPTH=48	COLORDEPTH=24
GRAYSCALE=		Optional	GRAYSCALE=16	GRAYSCALE=8
IDEXPORT=	Complete path of the ID server module for matching the patient data (for DOS compatibility short 8.3 paths, parameters are not permitted)	Optional	IDEXPORT= C:\PROGRAMME\IDSRV.EXE	
IDEXPORT_OS=	Operating system of the module: 1 – Windows 2 – DOS 3 – UNIX/LINUX	Optional	IDEXPORT_OS=1	

Table 1   Interface specification VDDS-media 1.4

IDEXPORT_EVENT=	Name of an event which is fired by the communication partner when it has finished the processing (max. 60 characters)	Optional	IDEXPORT_EVENT= ID_EVENT	

The fields with the light-gray background are new from version 1.4. The gray data are optional.

Table 2

Structure of the VDDS_MMI.INI file - entries of the IPS

The VDDS_MMI.INI file has a Windows INI-file format and is located in a Windows directory on the PC. The file is created by the program which is installed first; all programs which are installed later add to the data of the file. Each program handles its own entries.

Entry	Explanation	Specification	Example	Interpretation if missing
[BVS]				
NAME1=	Section name of the IPS (max. 30 characters)	Mandatory	NAME1=PMS1	
NAME2=	Section name of the IPS (max. 30 characters)	Mandatory	NAME2=PMS2	
ARCHIV=	Section name of the IPS image archive (**IPS_ARCHIVE** as a rule)	Optional	ARCHIV=IPS_ARCHIVE	
[BVS1]	The entry in the square brackets must comply with that in **NAME1**. Every further registered IPS gets its own section.			
NAME=	Name which is to be used for display at the communication partner	Mandatory	NAME=3D image processing	
VERSION=	Interface version of VDDS-media supported by the IPS	Mandatory	VERSION=1.4	
STAGES=	Specification of the VDDS-media stages supported by the IPS (ascending order)	Mandatory	STAGES=1234567	
PVSLIMIT=	Is set by the IPS if it supports only one PMS for the storage of the patient numbers (all PMS which are not given here must not address nor offer for selection this IPS anymore then)	Optional	PVSLIMIT=PMS1	

Table 2   Interface specification VDDS-media 1.4

SUPPORTSELECT=	This flag shows whether the IPS supports the individual image selection with SELECT (**0**=no, **1**=yes) **SELECT** can be used accordingly with **DATE=** in **Tables 3** and **4** then.	Optional	SUPPORTSELECT=1	SUPPORTSELECT=0
SUPPORTNEW=	This flag shows whether the IPS supports the creation of new images with NEW (e.g. X-ray order) (**0**=no, **1**=yes) **NEW** can be used accordingly with **DATE=** in **Tables 3** and **4** then.	Optional	SUPPORTNEW=1	SUPPORTNEW=0
SUPPORTNEWTYPE=	This flag plays only a role if **SUPPORTNEW=1** and the IPS supports several image types for taking images. In this case the possible image types must be given as clear text separated with a comma. A PMS which sends an image order with **DATE=NEW** to this IPS must offer these types for selection and transfer the result in **NEWTYPE=**.	Optional	SUPPORTNEWTYPE= FRS,Panorama	
SUPPORTINFO=	This flag shows whether the IPS supports the info mode for the transfer of patient data (transfer without activating the IPS) - (**0**=no, **1**=yes) Then **INFO=1** can be used in the **Table 3**.	Optional	SUPPORTINFO=1	SUPPORTINFO=0

Table 2   Interface specification VDDS-media 1.4

SUPPORTDEPTH=	This flag shows whether the IPS supports higher color depths for colored and grayscale images. COLORDEPTH=48 or 64 GRAYSCALE=12 or 16	Optional	SUPPORTDEPTH=1	SUPPORTDEPTH=0
SUPPORTTHUMNAILS=	This flag shows whether the IPS supports the export of thumbnails in addition to the image data (**0**=no, **1**=yes).	Optional	SUPPORTTHUMNAILS=1	SUPPORTTHUMNAILS=0
PATDATIMPORT=	Complete path of the IPS import module for patient data (for DOS compatibility short 8.3 paths, parameters are not permitted)	Mandatory	PATDATIMPORT = C:\PROGRAMME\PATIMP.EXE	
PATDATIMPORT_OS=	Operating system of the module: **1** – Windows **2** – DOS **3** – UNIX/LINUX	Mandatory	PATDATIMPORT_OS=1	
PATDATIMPORT_EVENT=	Name of an event which is fired by the communication partner when it has finished the processing (max. 60 characters)	Recommended	PATDATIMPORT_EVENT= PATIMPORT_EVENT	
MMOINFEXPORT=	Complete path of the export module for image descriptions of the IPS (for DOS compatibility short 8.3 paths, parameters are not permitted)	Recommended	MMOINFEXPORT= C:\PROGRAMME\INFEXP.EXE	
MMOINFEXPORT_OS=	Operating system of the module: **1** – Windows **2** – DOS **3** – UNIX/LINUX Mandatory field if MMOINFEXPORT is given.	Conditionally mandatory	MMOINFEXPORT_OS=1	

Table 2   Interface specification VDDS-media 1.4

MMOINFEXPORT_EVENT=	Name of an event which is fired by the communication partner when it has finished the processing (max. 60 characters)	Recommended conditionally	MMOINFEXPORT_EVENT= EXPORT_EVENT	
MMOEXPORT=	Complete path of the export module for image copies of the IPS (for DOS compatibility short 8.3 paths, parameters are not permitted)	Recommended	MMOEXPORT= C:\PROGRAMME\IMGEXP.EXE	
MMOEXPORT_OS=	Operating system of the module: 1 – Windows 2 – DOS 3 – UNIX/LINUX Mandatory field if MMOEXPORT is given.	Conditionally mandatory	MMOEXPORT_OS=1	
MMOEXPORT_EVENT=	Name of an event which is fired by the communication partner when it has finished the processing (max. 60 characters)	Recommended conditionally	MMOEXPORT_EVENT= BILEXPORT_EVENT	
MMOVIEW=	Complete path of the viewer of the IPS (for DOS compatibility short 8.3 paths, parameters are not permitted)	Recommended	MMOINFIMPORT= C:\PROGRAMME\VIEWER.EXE	
MMOVIEW_OS=	Operating system of the module: 1 – Windows 2 – DOS 3 – UNIX/LINUX Mandatory field if MMOVIEW is given.	Conditionally mandatory	MMOINFIMPORT_OS=1	

The fields with the light-gray background are new from version 1.4. The gray data are optional.

Table 3
Transfer of patient data from the PMS to the IPS

The transfer file is managed by the PMS, has a Windows INI-file format and should be located in a temporary directory on the local hard disk.				
Entry	**Explanation**	**Specification**	**Example**	**Interpretation if missing**
[PATIENT]				
PVS=	Section name of the PMS which sends the data (as registered in VDDS_MMI.INI)	Mandatory	PVS=Z1	
BVS=	Section name of the IPS to which the data are sent (as registered in VDDS_MMI.INI) (is required for the archive and the direct return of image descriptions; the PMS must store the name of the IPS for every image record it has received so that the image can be requested later)	Mandatory	BVS=DIMAXIS	
FROMPVS=	Section name of the PMS which manages the patient if the PMS differs from the entry **PVS=** (using the ID server); in this special case the field is a mandatory field	Conditionally mandatory	PVS=DSWIN	
PRXNR=	Practice number if several practices or clients participate in the communication. The practice number must be settable in the PMS in this case. **One IPS must always support PRXNR.**	Optional	PRXNR=1	PRXNR=1
PATID=	Patient's identification number, alphanumeric, max. 12 digits	Mandatory	PATID=1234	
INSURANCEID=	Insured ID acc. to the eGK (*2) If the data in the PMS are taken from an eGK, then it is a mandatory field	Conditionally mandatory	INSURANCEID=A123456789	

Table 3   Interface specification VDDS-media 1.4

PATSHOWNR=	If the number provided to the practice for patient selection differs from the identification number the number provided for selection can be given here	Optional	PATSHOWNR=P01234	
MODELLNR=	Support of the model number typically used in the KFO range	Optional	MODELLNR=01/24	
DOCTOR=	Name of the main therapist/physician	Optional	DOCTOR=Dr. Meier	
LASTNAME=	Last name of the patient (*1)	Mandatory	LASTNAME=Meier	
FIRSTNAME=	First name of the patient (*1)	Mandatory	FIRSTNAME=Paul	
TITLE=	Academic title of the patient (e.g. Prof., Dr.) (*1)	Recommended	TITLE=Prof. Dr.	
NAMEADDON=	Name add-on (e.g. of) (*1)	Recommended	NAMEADDON=of	
NAMEPREFIX=	Name prefixes (e.g. Baron) (*2)	Recommended	NAMEPREFIX=Baron	
MIDDLENAME=	This information was included for interfacing with software from the Anglo-American world.	Optional	MIDDLENAME=J.	
PREFERREDNAME=	This information was included for interfacing with software from the Anglo-American world.	Optional	PREFERREDNAME=Meier	
BIRTHDAY=	Birthday in the format of CCYYMMDD (*1)	Recommended	BIRTHDAY=19592601	
SEX=	Sex: **M** male, **W** female (*2)	Recommended	SEX=M	
SALUTATION=	Salutation: **1**=Mister, **2**=Mistress, **3**=Miss	Optional	SALUTATION=1	
STREET=	Street and house number (*1)	Recommended	STREET=Am See 1	
CITY=	Place (*1)	Recommended	CITY=Berlin	
ZIP=	Zip code (*1)	Recommended	ZIP=08223	
COUNTRY	Country (acc. to EU standard) (*2)	Recommended	COUNTRY=DE	
ADDRADDON=	Address add-on (*2)	Optional	ADDRADDON=backyard	

Table 3   Interface specification VDDS-media 1.4

EMPLOYER=	Employer	Optional	EMPLOYER=Siemens	
PROFESSION=	Profession	Optional	PROFESSION=chef	
HOMEPHONE=	Home phone number	Optional	HOMEPHONE=0301234567	
WORKPHONE=	Office phone number	Optional	WORKPHONE=0301234567	
CELLULAR=	Cell phone	Optional	CELLULAR=017612345678	
EMAIL=	E-mail address	Optional	EMAIL=paul@web.de	
INSURANCESTATUS=	Insurance status: **M**=member, **F**=coinsured family member, **R**=pensioner, **P**=private	Optional	INSURANCESTATUS=M	
INSURANCE=	Name of the health insurance company	Optional	INSURANCE=Barmer	
INSURANCENUMBER=	Number of the health insurance company	Optional	INSURANCENUMBER=1234567	
POLICYNUMBER=	Patient's policy number with the health insurance	Optional	POLICYNUMBER=12345	
MAKEMMOS=	With **MAKEMMOS=1** the PMS requests the IPS to return the existing image descriptions (see PVSIMP)	Optional	MAKEMMOS=1	MAKEMMOS=0
DATE=	This information is only required if **MAKEMMOS=1** and the descriptions of the returned images are to be specified. blank - data of all images to be transferred CCYYMMDD – data of all images from this date to be transferred SELECT – have image selected in the IPS NEW – create new image in the IPS SELECT and NEW are only possible if the IPS allows it (see VDDS_MMI.INI). As a rule, **PVSIMP=1** should be set for both options as the operation of the IPS may take longer and the interface will run into a timeout then. With **INFO=1** SELECT and NEW are not allowed.	Optional	DATE=20081204	DATE=

Table 3 Interface specification VDDS-media 1.4

NEWTYPE=	If **DATE=NEW** is given and the IPS supports taking several different image types (see **SUPPORTNEWTYPE=** in Table 2), the PMS must implement the type selection and transfer the result of the selection.	Optional	NEWTYPE=FRS	
PVSIMP=	This information is only required if **MAKEMMOS=1** and the descriptions of the returned images are to run via the import module of the PMS. If this entry does not exist or if it has the value **PVSIMP=0**, the IPS will write the information according to Table 6/7 directly into the file which is transferred at the call (initial INI-file). If **PVSIMP=1**, a new INI-file has to be prepared for the call of the PMS image description import module according to Table 5 and the initial INI-file has to be terminated with **READY=1** then. After that the image descriptions have to be written into the new INI-file according to Table 6/7 and the PMS image description import module (**MMOINFIMPORT** in the VDDS_MMI.INI) has to be called. With **PVSIMP=1** the following section has to be written into the initial INI-file before **READY=1** is set: [MMOS] COUNT=0	Optional	PVSIMP=1	PVSIMP=0
THUMBNAILS=	This information is only required if **MAKEMMOS=1** and if thumbnails are desired. Here the PMS must consider whether the IPS supports this function (**SUPPORTTHUMBNAILS=1** in the IPS section) The PMS handles the deletion of the thumbnails.	Optional	THUMBNAILS=1	THUMBNAILS=0

Table 3   Interface specification VDDS-media 1.4

THUMBNAILSX=	Desired maximum width of the thumbnails Unless specified, the value will be defined by the IPS.	Optional	THUMBNAILSX=320	
THUMBNAILSY=	Desired maximum height of the thumbnails Unless specified, the value will be defined by the IPS. If width and height are restricted, the IPS must ensure that the height/side ratio of the respective image is maintained and the value with the stronger restricting effect is applied for the reduction.	Optional	THUMBNAILSY=200	
INFO=	If **INFO=1**, the IPS only accepts the data and feeds back image descriptions upon request without activating the IPS. Otherwise the IPS has to be started or its window has to be brought into the foreground and the transferred patient must be selected.	Optional	INFO=0	INFO=0
READY=	The PMS initializes this value with 0 and the IPS sets the flag to 1 when the transfer file has been processed or all requested image descriptions have been written	Mandatory	READY=1	
ERRORLEVEL=	Return value of the processing: **0**=Ok, **≥1**=error	Mandatory	ERRORLEVEL=0	
ERRORTEXT=	Description of the error in clear text	Recommended	ERRORTEXT=PATID already exists	
(*1) – the fields correspond to those of the KVK/eGK (health insurance card/electronic health card) (*2) – the fields correspond to those of the eGK The fields with the light-gray background are new from version 1.4. The gray data are optional.				

Table 4

Image descriptions request by the PMS from the IPS

The transfer file is managed by the PMS, has a Windows INI-file format and should be located in a temporary directory on the local hard disk.				

Entry	Explanation	Specification	Example	Interpretation if missing
[PATID]				
PVS=	Section name of the PMS which sends the data (as registered in VDDS_MMI.INI)	Mandatory	PVS=Z1	
BVS=	Section name of the IPS where the images are requested. If an archive is used, the entry must contain the section name of the desired IPS unless communication with the archive itself is desired. However, the module of the archive is called as a rule.	Mandatory	BVS=DIMAXIS	
FROMPVS=	Section name of the PMS which manages the patient if the PMS differs from the entry **PVS=** (using the ID server); in this special case the field is a mandatory field	Conditionally mandatory	PVS=DSWIN	
PRXNR=	Practice number of the practice which requests the images.	Optional	PRXNR=1	PRXNR=1
PATID=	Identification number of the patient whose images are requested.	Mandatory	PATID=1234	
PATSHOWNR=	If the number provided to the practice for patient selection differs from the identification number the number provided for selection can be given here	Optional	PATSHOWNR=P01234	
MODELLNR=	Support of the model number typically used in the KFO range	Optional	MODELLNR=01/24	

Table 4   Interface specification VDDS-media 1.4

DATE=	This information is only required if the descriptions of the returned images are to be specified. blank - data of all images to be transferred CCYYMMDD – data of all images from this date to be transferred SELECT – have image selected in the IPS NEW – create new image in the IPS SELECT and NEW are only possible if the IPS allows it (see VDDS_MMI.INI). As a rule, **PVSIMP=1** should be set for both options as the operation of the IPS may take longer and the interface will run into a timeout then.	Optional	DATE=20081204	DATE=
NEWTYPE=	If **DATE=NEW** is given and the IPS supports taking several different image types (see **SUPPORTNEWTYPE=** in Table 2), the PMS must implement the type selection and transfer the result of the selection.	Optional	NEWTYPE=FRS	

PVSIMP=	This information is only required if the descriptions of the returned images are to run via the import module of the PMS. If this entry does not exist or if it has the value **PVSIMP=0**, the IPS will write the information according to **Table 6/7** directly into the file which is transferred at the call (initial INI-file). If **PVSIMP=1**, a new INI-file has to be prepared for the call of the PMS image description import module according to **Table 5** and the initial INI-file has to be terminated with **READY=1** then. After that the image descriptions have to be written into the new INI-file according to **Table 6/7** and the PMS image description import module (MMOINFIMPORT in the VDDS_MMI.INI) has to be called. With **PVSIMP=1** the following section has to be written into the initial INI-file before **READY=1** is set: **[MMOS]** **COUNT=0**	Optional	PVSIMP=1	PVSIMP=0
THUMBNAILS=	This information is only required if thumbnails are desired. Here the PMS must consider whether the IPS supports this function (**SUPPORTTHUMBNAILS=1** in the IPS section) The PMS handles the deletion of the thumbnails.	Optional	THUMBNAILS=1	THUMBNAILS=0
THUMBNAILSX=	Desired maximum width of the thumbnails Unless specified, the value will be defined by the IPS.	Optional	THUMBNAILSX=320	

Table 4   Interface specification VDDS-media 1.4

THUMBNAILSY=	Desired maximum height of the thumbnails Unless specified, the value will be defined by the IPS. If width and height are restricted, the IPS must ensure that the height/side ratio of the respective image is maintained and the value with the stronger restricting effect is applied for the reduction.	Optional	THUMBNAILSY=200	
READY=	The PMS initializes this value with 0 and the IPS sets the flag to 1 when the transfer file has been processed or all requested image descriptions have been written	Mandatory	READY=1	
ERRORLEVEL=	Return value of the processing: **0**=Ok, ≥**1**=error	Mandatory	ERRORLEVEL=0	
ERRORTEXT=	Description of the error in clear text	Recommended	ERRORTEXT=Patient is unknown	

The fields with the light-gray background are new from version 1.4. The gray data are optional.

The transfer file is managed by the IPS, has a Windows INI-file format and should be located in a temporary directory on the local hard disk.

After the **Table 5** has been created, this file will be supplemented with the information specified in the **Tables 6** and **7** by the IPS.

Entry	Explanation	Specification	Example	Interpretation if missing
[PATID]				
PVS=	Section name of the PMS which is to receive the data (as registered in VDDS_MMI.INI)	Mandatory	PVS=Z1	
BVS=	Section name of the IPS from which the images are provided. The PMS must store the name of the IPS in addition to the MMOID to be able to request an image later.	Mandatory	BVS=DIMAXIS	
FROMPVS=	Section name of the PMS which manages the patient. The PMS may only accept these data if the patient is known to the PMS.	Mandatory	PVS=DSWIN	
PRXNR=	Practice number of the practice for which the images are selected for use.	Mandatory	PRXNR=1	
PATID=	Identification number of the patient for whom the images are selected.	Mandatory	PATID=1234	
READY=	The IPS initializes this value with 0 and the PMS sets the flag to 1 when all requested image descriptions have been accepted.	Mandatory	READY=1	
ERRORLEVEL=	Return value of the processing: **0**=Ok, **≥1**=error	Mandatory	ERRORLEVEL=0	

ERRORTEXT=	Description of the error in clear text	Recommended	ERRORTEXT=Patient is unknown	

The fields with the light-gray background are new from version 1.4. The gray data are optional.

Table 6

Transfer of image descriptions from the IPS to the PMS

This information is added to an existing table depending on the context:

❑ Request of data at the patient transfer from the PMS → **Table 3**

❑ Request through the PMS → **Table 4**

❑ Transfer of information through the IPS to the import module of the PMS → **Table 5**

❑ Transfer of selected images through the IPS to the import module of the PMS → **Table 5**

Entry	Explanation	Specification	Example	Interpretation if missing
[MMOS]				
COUNT=	Shows the number of transferred image descriptions	Mandatory	COUNT=3	
[MMO1]				
Information on the image acc. to **Table 7**.				
[MMO2]				
Information on the image acc. to **Table 7**.				
[MMO3]				
Information on the image acc. to **Table 7**.				
	The number of entries [MMO*] must be correlative with the value of COUNT= . There must be exactly as many entries as given under COUNT= .			
The error case is recorded in the table given in the head (**ERRORLEVEL** and **ERRORTEXT**). In addition **COUNT=0** must be set in the event of an error.				

Table 7
Transfer of image descriptions from the IPS to the PMS

This information is added for every image to the specifications made in **Table 6**.				

Entry	Explanation	Specification	Example	Interpretation if missing
[MMO*]	The * must be replaced by the consecutive number of the transferred image data (1, 2, 3, etc.).			
MMOID=	Unique number of the image in the IPS, max. 200 alphanumeric characters	Mandatory	MMOID=2002473	
PRXNR=	Practice number to which the image belongs. If this information is missing in the IPS because previous interface versions are used, **1** must be returned.	Mandatory	PRXNR=1	
TYPE=	Image type in clear text. The clear text should be based on **Table 15**. When DICOM series are used DICOM-SERIAL must be returned.	Mandatory	TYPE=Panorama	
TYPENR=	Unique image type acc. to **Table 15**.	Mandatory	TYPENR=3	
TEETH=	Tooth information Single tooth: TEETH=31 Group of teeth: TEETH=13-23 Teeth enumerated: TEETH=12,13,42,43	Optional	TEETH=18-48	
PREGNANCY=	Only for X-rays: Patient is pregnant (**0**=no, **1**=yes; only for female patients)	Optional	PREGNANCY=1	PREGNANCY=0
XRAYCOMMENT=	Only for X-rays: Reasons for X-ray/indication acc. to X-ray act If **PREGNANCY=1** mandatory field.	Conditionally mandatory	XRAYCOMMENT=acute lesion	
XRAYMS=	Only for X-rays: Exposure time in milliseconds (ms)	Optional	XRAYMS=35	

Table 7   Interface specification VDDS-media 1.4

XRAYCURRENT=	Only for X-rays: Current in milliamp (mA)	Optional	XRAYCURRENT=120	
XRAYVOLTAGE=	Only for X-rays: Tube voltage in kilovolt (kV)	Optional	XRAYVOLTAGE=35	
EXT=	File data type acc. to **Table 13** Several types can be specified, separated by commas, if the IPS supports several formats.	Recommended	EXT=JPG	EXT=TIF
COLORTYPE=	COLOR type acc. to **Table 14**. The table contains the information if it is mandatory.	Conditionally mandatory	COLORTYPE=GRAYSCALE	
DATE=	Capture date in the format CCYYMMDD	Mandatory	DATE=20081214	
TIME=	Capture time in the format HH:MM To be transferred only if known.	Recommended	TIME=13:44	
COMMENT=	Free text, max. 255 characters	Optional	COMMENT=Tumor	
THUMBNAIL=	Path to the thumbnail file. Thumbnails have to be created in the format BMP or JPG with 8 bit color depth per color channel as a rule. In the case of objects which are no images the IPS has to create a suitable symbol. The PMS handles the deletion of the data. The information is given only if the PMS requests thumbnails and the IPS supports them. If IMAGEDATA= is used, it is not permitted to use THUMBNAIL= . If the information is available, the PMS handles the deletion of the thumbnails.	Recommended	THUMBNAIL=C:\TEMP\THB1.BMP	

Table 7   Interface specification VDDS-media 1.4

IMAGEDATA=	Path to the copy of the image file. The IPS may only send image copies to the PMS if the latter permits it (**DIRECTIMAGEIMPORT=1**). If the information is available, the PMS handles the deletion of the images.	Optional	IMAGEDATA=C:\TEMP\IMG1.TIF	
ACTIVATE=	This information is only provided if **IMAGEDATA=** is used. This requests the PMS to display the transferred image immediately. If several images are transferred at once, this information must only be given with exactly one image.	Optional	ACTIVATE=1	ACTIVATE=0

The fields with the light-gray background are new from version 1.4. The gray data are optional.

Table 8

Invoking of image data by the PMS from the IPS

The transfer file is managed by the PMS, has a Windows INI-file format and should be located in a temporary directory on the local hard disk.

The IPS adds to this file acc. to **Table 9**.

Entry	Explanation	Specification	Example	Interpretation if missing
[MMOIDS]				
PVS=	Section name of the PMS which requests the data (as registered in VDDS_MMI.INI)	Mandatory	PVS=Z1	
COUNT=	Number of images requested	Mandatory	COUNT=3	
MMOID1=	Image ID of the first image requested	Mandatory	MMOID1=2000183	
MMOID2=	Image ID of the second image requested	Mandatory	MMOID1=2000184	
MMOID3=	Image ID of the third image requested	Mandatory	MMOID1=2000185	
	The number of entries MMOID*= must be correlative with the value of COUNT= . There must be exactly as many entries as given under COUNT= .			
COLORDEPTH=	Maximum color depth supported by the PMS as information for the IPS.	Recommended	COLORDEPTH=48	COLORDEPTH=24
GRAYSCALE=	Maximum color depth for grayscales supported by the PMS as information for the IPS.	Recommended	GRAYSCALE=16	GRAYSCALE=8

Table 8   Interface specification VDDS-media 1.4

EXT=	Preferred image format which the PMS requests. Several formats can be given, separated by a comma. The priority of request decreases from left to right. If the IPS cannot handle any of the requested formats, the system will use standard TIF.	Recommended	EXT=JPG,DCM	EXT=TIF
READY=	The PMS initializes this value with 0 and the IPS sets the flag to 1 when all requested images have been stored and written.	Mandatory	READY=1	
ERRORLEVEL=	Return value of the processing: **0**=Ok, ≥**1**=error	Mandatory	ERRORLEVEL=0	
ERRORTEXT=	Description of the error in clear text	Mandatory	ERRORTEXT=image not found	

The fields with the light-gray background are new from version 1.4. The gray data are optional.

Table 9

Image data provided by the IPS

The IPS adds these data to the file of **Table 8**. The IPS stores copies of the images in a temporary directory on the local hard disk.

Entry	Explanation	Specification	Example	Interpretation if missing
[MMOPATH]				
MMOID1=	Path to the image copy created by the IPS, including file name. If DICOM series are used, only the directory name is given. The file type which the IPS provides is given by the file name extension. The PMS handles the deletion of the image copy.	Mandatory	MMOID1=C:\TEMP\IMG1.TIF	
MMOID2=	…	Mandatory		
MMOID3=	…	Mandatory		
	The number of entries MMOID*= must be correlative with the value of COUNT= in the **Table 8**. There must be exactly as many entries as given under COUNT= .			

Table 10
Matching the patient data of a PMS or IPS with the ID server

The transfer file is managed by the PMS or IPS which calls the ID server. It has the format of a Windows INI file and should be stored in a temporary directory on the local hard disk.

Entry	Explanation	Specification	Example	Interpretation if missing
[PATIENT]				
PVS=	Section name of the PMS which wants to match the data.	Conditionally mandatory	PVS=Z1	
BVS=	Section name of the IPS which wants to match the data. Exactly one of the two entries IPS or PMS must be available, depending on which program type is calling the ID server.	Conditionally mandatory	BVS=DIMAXIS	
LASTNAME=	Last name of the patient (*1)	Mandatory	LASTNAME=Meier	
FIRSTNAME=	First name of the patient (*1)	Mandatory	FIRSTNAME=Paul	
TITLE=	Academic title of the patient (e.g. Prof., Dr.) (*1)	Recommended	TITLE=Prof. Dr.	
NAMEADDON=	Name add-on (e.g. of) (*1)	Recommended	NAMEADDON=of	
NAMEPREFIX=	Name prefixes (e.g. Baron) (*2)	Recommended	NAMEPREFIX=Baron	
MIDDLENAME=	This information was included for interfacing with software from the Anglo-American world.	Optional	MIDDLENAME=J.	
PREFERREDNAME=	This information was included for interfacing with software from the Anglo-American world.	Optional	PREFERREDNAME=Meier	
BIRTHDAY=	Birthday in the format of CCYYMMDD (*1)	Mandatory	BIRTHDAY=19592601	

Table 10	Interface specification VDDS-media 1.4

SEX=	Sex: **M** male, **W** female (*2)	Recommended	SEX=M	
READY=	The PMS or IPS initializes this value with 0 and the ID server sets the flag to 1 when the patient data have been returned.	Mandatory	READY=1	
ERRORLEVEL=	Return value of the processing: **0**=Ok, **≥1**=error	Mandatory	ERRORLEVEL=0	
ERRORTEXT=	Description of the error in clear text	Recommended	ERRORTEXT=PATID already exists	

(*1) – the fields correspond to those of the KVK/eGK (health insurance card/electronic health card)
(*2) – the fields correspond to those of the eGK

The fields with the light-gray background are new from version 1.4. The gray data are optional.

This information is added to the file of **Table 10**.				
Entry	**Explanation**	**Specification**	**Example**	**Interpretation if missing**
[PATIDS]				
COUNT=	Returns the number of patients which correspond to the transferred information.	Mandatory	COUNT=2	
[PATID1]				
Information on the patient acc. to **Table 12**.				
[PATID2]				
Information on the patient acc. to **Table 12**.				
	The number of entries [PATID*] must be correlative with the value of COUNT= . There must be exactly as many entries as given under COUNT= .			

This information is added to the file of **Table 11**.

Entry	Explanation	Specification	Example	Interpretation if missing
[PATID*]	The * must be replaced by the consecutive number of the transferred patient data (1, 2, 3, etc.).			
PRXNR=	Practice number if several practices or clients participate in the communication.	Optional	PRXNR=1	PRXNR=1
PATID=	Patient's identification number, alphanumeric, max. 12 digits	Mandatory	PATID=1234	
INSURANCEID=	Insured ID acc. to the eGK (*2) If the data in the PMS are taken from an eGK, then it is a mandatory field	Conditionally mandatory	INSURANCEID=A123456789	
PATSHOWNR=	If the number provided to the practice for patient selection differs from the identification number the number provided for selection can be given here	Optional	PATSHOWNR=P01234	
MODELLNR=	Support of the model number typically used in the KFO range	Optional	MODELLNR=01/24	
DOCTOR=	Name of the main therapist/physician	Optional	DOCTOR=Dr. Meier	
LASTNAME=	Last name of the patient (*1)	Mandatory	LASTNAME=Meier	
FIRSTNAME=	First name of the patient (*1)	Mandatory	FIRSTNAME=Paul	
TITLE=	Academic title of the patient (e.g. Prof., Dr.) (*1)	Recommended	TITLE=Prof. Dr.	
NAMEADDON=	Name add-on (e.g. of) (*1)	Recommended	NAMEADDON=of	
NAMEPREFIX=	Name prefixes (e.g. Baron) (*2)	Recommended	NAMEPREFIX=Baron	
MIDDLENAME=	This information was included for interfacing with software from the Anglo-American world.		MIDDLENAME=J.	
PREFERREDNAME=	This information was included for interfacing with software from the Anglo-American world.		PREFERREDNAME=Meier	

Table 12   Interface specification VDDS-media 1.4

BIRTHDAY=	Birthday in the format of CCYYMMDD (*1)	Recommended	BIRTHDAY=19592601	
SEX=	Sex: **M** male, **W** female (*2)	Mandatory	SEX=M	
SALUTATION=	Salutation: **1**=Mister, **2**=Mistress, **3**=Miss	Optional	SALUTATION=1	
STREET=	Street and house number (*1)	Recommended	STREET=Am See 1	
CITY=	Place (*1)	Recommended	CITY=Berlin	
ZIP=	Zip code (*1)	Recommended	ZIP=08223	
COUNTRY	Country (acc. to EU standard) (*2)	Recommended	COUNTRY=DE	
ADDRADDON=	Address add-on (*2)	Optional	ADDRADDON=backyard	
EMPLOYER=	Employer	Optional	EMPLOYER=Siemens	
PROFESSION=	Profession	Optional	PROFESSION=chef	
HOMEPHONE=	Home phone number	Optional	HOMEPHONE=0301234567	
WORKPHONE=	Office phone number	Optional	WORKPHONE=0301234567	
CELLULAR=	Cell phone	Optional	CELLULAR=017612345678	
EMAIL=	E-mail address	Optional	EMAIL=paul@web.de	
INSURANCESTATUS=	Insurance status: **M**=member, **F**=coinsured family member, **R**=pensioner, **P**=private	Optional	INSURANCESTATUS=M	
INSURANCE=	Name of the health insurance company	Optional	INSURANCE=Barmer	
INSURANCENUMBER=	Number of the health insurance company	Optional	INSURANCENUMBER=1234567	
POLICYNUMBER=	Patient's policy number with the health insurance	Optional	POLICYNUMBER=12345	

(*1) – the fields correspond to those of the KVK/eGK (health insurance card/electronic health card)
(*2) – the fields correspond to those of the eGK

The fields with the light-gray background are new from version 1.4. The gray data are optional.

Table 13
File data types used

File data types used

EXT	Meaning	File extension	Specification
TIF	TIFF, uncompressed with max. 8 bit color depth per color channel	.tif	Mandatory
TIF16	TIFF with a higher color depth (e.g. 16-bit grayscales) can be used if both communication partners support it. For this purpose the information under **COLORDEPTH=** is used for colored images and **GRAYSCALE=** is used for grayscale images	.tif	
LZW	TIFF with LZW compression	.tif	
JPG	JPEG with max. 8 bit color depth per color channel	.jpg	
JPG16	JPEG with a higher color depth (e.g. 16-bit grayscales) can be used if both communication partners support it. For this purpose the information under **COLORDEPTH=** is used for colored images and **GRAYSCALE=** is used for grayscale images		
PNG	PNG file	.png	
DCM	Single DICOM file If DICOM files are used, **GRAYSCALE=16** is a prerequisite.	.dcm	
DOC	Microsoft WORD document	.doc	
DOCX	Microsoft WORD document	.docx	
PDF	PDF document	.pdf	
AVI	Video file	.avi	
WAV	Sound file	.wav	
STL	Standard Tesselation Language (3D objects)	.stl	
OBJ	3D objects, must contain only 3D elements	.obj	

Table 14
COLOR types used

COLOR types used	
COLORTYPE	**Meaning**
COLOR	Colored image The standard color depth is 24 bit. Higher color depths can be defined through **COLORDEPTH=** (32, 48, 64).
GRAYSCALE	Grayscales The standard color depth of grayscales is 8 bit. Higher color depths can be defined through **GRAYSCALE=** (12, 16).
LINEART	Text document
3D	3D object file

The information is mandatory with the following exceptions:

❑ Not required if objects are deleted, therefore ignored then.

❑ Not required if DICOM series are used, therefore ignored then.

❑ Not required if EXT=AVI and EXT=WAV, therefore ignored then.

Table 15

Object data types used

TYPENR	Description	COLORTYPE
0	DELETE - information that the object was deleted in the IPS	-
1	Small X-ray	GRAYSCALE
2	Bite-wing	GRAYSCALE
3	PSA (panoramic X-ray)	GRAYSCALE
4	FRS (ceph lateral)	GRAYSCALE
5	Status	GRAYSCALE
6	Video	COLOR/GRAYSCALE
7	Photo	COLOR/GRAYSCALE
8	Intraoral image	COLOR/GRAYSCALE
9	Video image	COLOR/GRAYSCALE
10	Form (prescription etc.)	COLOR/GRAYSCALE/LINEART
11	Expertise	COLOR/GRAYSCALE/LINEART
12	Invoice	COLOR/GRAYSCALE/LINEART
13	Correspondence patient	COLOR/GRAYSCALE/LINEART
14	Treatment plan	COLOR/GRAYSCALE/LINEART
15	Practice laboratory invoice	COLOR/GRAYSCALE/LINEART
16	External laboratory invoice	COLOR/GRAYSCALE/LINEART
17	Material list	COLOR/GRAYSCALE/LINEART
18	Model photo	COLOR/GRAYSCALE
19	Periodontal X-ray	GRAYSCALE
20	Hand-wrist X-ray	GRAYSCALE

Table 15   Interface specification VDDS-media 1.4

21	Analysis result	COLOR/GRAYSCALE/LINEART
22	Tracing	COLOR/GRAYSCALE/LINEART
23	Other	COLOR/GRAYSCALE/LINEART
24	Unknown (for documents which have already been used in a proprietary manner)	COLOR/GRAYSCALE/LINEART
25	Practice laboratory invoice (statutory health insurance)	COLOR/GRAYSCALE/LINEART
26	Practice laboratory invoice (private)	COLOR/GRAYSCALE/LINEART
27	External laboratory invoice (statutory health insurance)	COLOR/GRAYSCALE/LINEART
28	External laboratory invoice (private)	COLOR/GRAYSCALE/LINEART
29	Ceph frontal (remote X-ray frontal)	GRAYSCALE
30	Jaw joint X-ray	GRAYSCALE
31	DICOM series	-
32	SMV X-ray	GRAYSCALE
33	3D model scan	3D
34	3D cranium scan	3D