

AGFA MEDICAL IMAGING DICOM Conformance Statement

→ **ADC Workstation VIPS 1.1.XX**

SCU CR Storage

SCU Print Management

SCP CR Storage

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Document Information

Author	Willy Rosé	
Editing & Layout	Allan Morris	
For questions regarding the technical content of this document, please contact:	Willy Rosé	tel: +32 3 444 8239 fax: +32 3 455 4517

Issued by:
Agfa Medical Imaging
Septestraat 27
B-2640 Mortsel
Belgium

tel: +32 3 444 8221
fax: +32 3 444 8211
email: eduard.crits.ec@belgium.agfa.com

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Revision Record

Revision Number	Date	Author	Reason for Change
1.0	28/06/00	Wrosé	Initial revision
1.1	28/06/00	Wrosé	Revision valid for VIPS 1.1.05
2.0	7/09/00	Cweise	New conventions to be implemented
2.1	7/09/00	Cweise	New conventions implemented



1 INTRODUCTION

1.1 Intended Audience

The user of this document is involved with system integration and/or software design. We assume that the reader is familiar with the terminology and concepts that are used in the DICOM 3.0 standard.

Readers not familiar with DICOM 3.0 terminology should first read the appropriate parts of the DICOM standard itself, prior to reading this conformance statement.

Although the use of this conformance statement in conjunction with the DICOM 3.0 standard is intended to facilitate communication with other medical imaging equipment, it is not sufficient to guarantee, by itself, the inter-operation of the connection. The following issues need to be considered:

1.1.1 Integration

The integration of any device into a system of interconnected devices goes beyond the scope of the DICOM 3.0 standard and this conformance statement when *interoperability* is desired. The responsibility for analyzing the applications requirements and developing a solution that integrates the Agfa equipment with other vendors' systems is the user's responsibility and should not be underestimated.

1.1.2 Validation

Testing the complete range of possibilities between the Agfa equipment and non-Agfa devices, before the connection is declared operational, is deemed to be a necessity. The user should ensure that any non-Agfa provider accepts full responsibility for all validation required for their connection with the Agfa equipment. The accuracy of image data once it has crossed the interface between the Agfa equipment and the non-Agfa device as well as the stability of the image data for the intended applications is the responsibility of the non-Agfa provider.

1.1.3 Future Evolution

As the DICOM 3.0 standard evolves to meet the user's growing requirements and to incorporate new features and technologies, Agfa will follow the evolution of the standard. This evolution of the standard may require changes to devices that have implemented DICOM 3.0. The user should ensure that any non-Agfa provider who connects with Agfa devices also plans future evolution of the DICOM standard. A refusal to do so may reflect in the loss of functionality and/or connectivity between the different products.

1.2 Purpose of this Document

This document is a provisional DICOM Conformance statement for the storage and print services of the ADC Unix based workstation. The system is a Service Class User (SCU) for services relating to the storage and printing of images by use of the Auto Processing Software also known as Data Image Processing Station (DIPS) or the Interactive Processing Software also known as Viewing Image Processing Station (VIPS).

2 IMPLEMENTATION MODEL

2.1 Application Data Flow Diagram

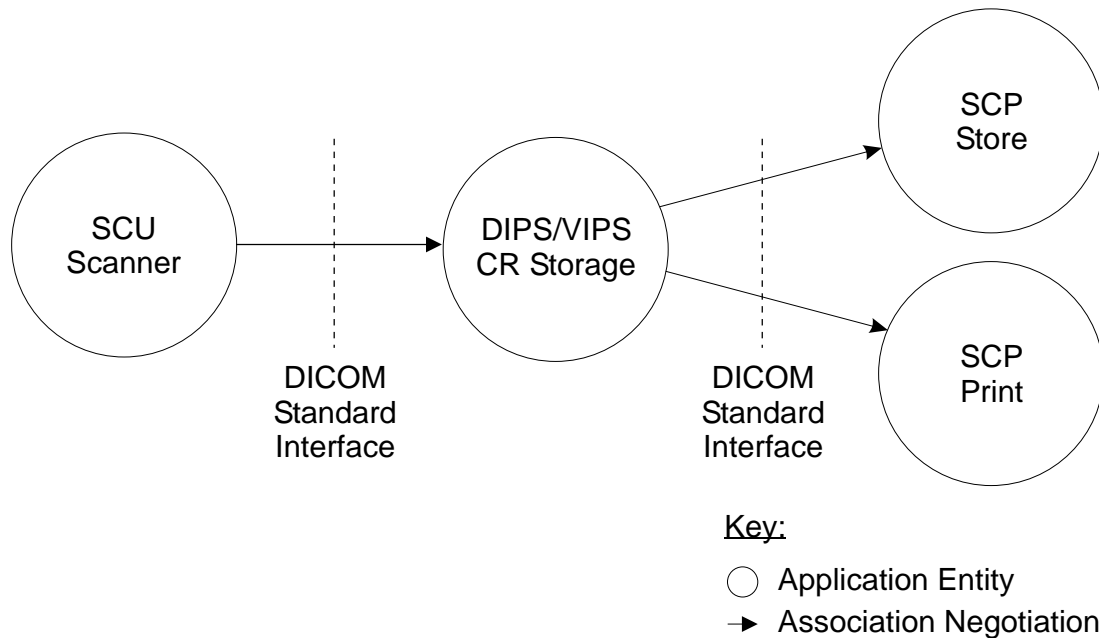


Figure 2.1 Implementation model.

2.2 Functional Definitions of Application Entities

The Application Entity of the IRC_adc_impax_AS or IRC_adc_impax_RS processes initiate an association to a Remote AE to send an image. If the Remote AE accepts the presentation context applicable to the image being sent, the DICOM Server AE will send the image by invoking a C-STORE-RQ operation for each image on the same association.

The Application Entity of the IRC_adc_dicom process waits for association requests from Remote AEs (typical the Agfa digitizer) that wish to perform an image store operation. When a C-STORE-RQ message is received, the DICOM Server AE will receive the image and try to update the local database. If the image is stored successfully the status of "success" will be returned in a C-STORE-RSP message.

The Application Entity of the IRC_print_dicom or IRC_adc_hardcopy processes initiate an association to a Remote AE to send a print job.

2.3 Sequencing of Real World Activities

Not applicable.

3 AE SPECIFICATIONS

3.1 DIPS/VIPS Specifications

DIPS/VIPS provides standard conformance to the following DICOM 3.0 SOP Class as an SCP and SCU.

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1

Table 3.1 Storage SOP classes.

DIPS/VIPS provides standard conformance to the following DICOM 3.0 SOP Class as SCU.

SOP Class Name	SOP Class UID
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9

Table 3.2 Print SOP classes.

Supported transfer syntaxes

Name-list	UID-list
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 3.3 Transfer syntaxes.

3.1.1 Association Establishment Policies

3.1.1.1 General

The following Application Context Name will be proposed and recognized by DIPS/VIPS:

- ▶ DICOM 3.0 Application Context: **1.2.840.10008.3.1.1.1**
 - Maximum PDU size as SCP storage: 32768 bytes (32 KB)
 - Maximum PDU size as SCU storage: 65536 bytes (64 KB)
 - Maximum PDU size as SCU print: 32768 bytes (32 KB)

3.1.1.2 Number of Associations

DIPS/VIPS will initiate a separate association for each CR image to be transmitted. Extended Negotiation is not called for.

3.1.1.3 Asynchronous Nature

DIPS/VIPS will never send any data in an asynchronous fashion. Receiving asynchronous transmissions will result in the association being aborted.

3.1.1.4 Implementation Identifying Information

DIPS/VIPS will respond with the following implementation identifying parameters:

- ▶ Implementation Class UID: **1.3.51.0.7.6290.3.1**
- ▶ Implementation Version Name: **PS5000-SW3.1**

3.1.1.5 Called/Calling AE Titles

The default calling title that DIPS/VIPS will use is "PS5000". This parameter can be configured via the so called CCM tool, the configurator for ADC-related equipment.

3.1.2 Association Initiation by Real World Activity

3.1.2.1 Real World Activity - Storage

3.1.2.1.1 Associated Real World Activity - Storage

DIPS/VIPS will transmit images that have been sent to it previously by the ADC digitizer, driven by user requests or automated processes. The operator can select the image(s) to transmit from the user interface and select the destination via the "Archive" or "Send" button, according to the configuration.

In case of auto transmit the routing patterns are defined with the CCM tool and initiated at time of identification of the cassette.

If multiple images are chosen to be transmitted, one association will be established for each of the images.

3.1.2.1.2 Presentation Context Table – Storage

SOP Class	Transfer Syntax	Role	Extended Negotiation
All Table 3.1	All Table 3.3	SCU	None

Table 3.4 Presentation context for storage.

3.1.2.1.3 SOP-Specific Conformance - Storage

DIPS/VIPS conforms to the DICOM Storage Service Class as an SCU. The following tables provide an overview of the transmitted DICOM items.

The user can specify 4 (four) User_Info fields, numbered from 0 to 3. Each of these fields can optionally be transmitted as a separate DICOM item to be chosen from the attributes with the value: "User_Info field".

The user is, however, responsible for acceptable contents for each redirected User_Info field: this refers to the length of the DICOM items and also to the accepted character set as specified in Section 6. The transmission will be aborted if any error occurs.

Attribute Name	Tag	Value
Patient's name	0010,0010	
Patient ID	0010,0020	
Patient's Birth Date	0010,0030	
Patient's sex	0010,0040	
Ethnic Group	0010,2160	User_Info field
Other Patient ID	0010,1000	User_Info field

Table 3.5 Patient module.

Attribute Name	Tag	Value
Study instance UID	0020,000D	
Study date	0008,0020	
Study time	0008,0030	
Referring physician's name	0008,0090	
Study ID	0020,0010	
Accession number (RIS ID)	0008,0050	
Study description	0008,1030	
Name of physician reading study	0008,1060	User_Info field (See Note)

Table 3.6 General study module.

Note:

The digitizer sends 0008,1050 Performing physician's name. This field is stored in the workstation as radiologist.

The workstation will send the radiologist entry to 0008,1050 (Performing Physician's name) and 0008,1060 (Physician Reading study) in the CR Store object.

When the field 0008,1060 (Physician Reading study) is specified as a user info field, the field will be overwritten with the specified user-info field.

Attribute Name	Tag	Value
Admitting diagnosis description	0008,1080	User_Info field
Patient's size	0010,1020	User_Info field
Patient's weight	0010,1030	User_Info field
Occupation	0010,2180	User_Info field
Additional patient history	0010,21B0	User_Info field

Table 3.7 Patient study module.

Attribute Name	Tag	Value
Modality	0008,0060	Fixed CR
Series description (exam subtype)	0008,103E	
Series instance UID	0020,000E	
Series sequence number (original number)	0020,0011	
Laterality	0020,0060	
Performing physician's name	0008,1050	

Table 3.8 General series module.

Attribute Name	Tag	Value
Body part examined	0018,0015	
View position	0018,5101	
Screen type (plate type)	0018,1260	
Filter type	0018,1160	User_Info field
Collimator/grid name	0018,1180	User_Info field

Table 3.9 CR series module.

Attribute Name	Tag	Value
Manufacturer	0008,0070	Fixed AGFA
Institution name (Institution ID, Hospital name)	0008,0080	
Station name (User-defined digitizer name)	0008,1010	
Device serial number	0018,1000	
Institutional department name	0008,1040	
Manufacturer's model name	0008,1090	ADC_5145 for ADC Compact ADC_51xx for ADC Solo
Software versions	0018,1020	

Table 3.10 General equipment module.

Attribute Name	Tag	Value
Image type	0008,0008	Fixed DERIVED/PRIMARY
Image number	0020,0013	
Images in acquisition	0020,1002	
Acquisition date (Identification date)	0008,0022	
Acquisition time (Identification time)	0008,0032	
Image comment (see Note)	0020,4000	
Lossy Image Compression	0028,2110	00

Note:

Format: <Comment-proper>^<User-info-0>^ ... ^<User-info-3>

Table 3.11 General image module.

Attribute Name	Tag	Value
Samples per pixel/Number of planes	0028,0002	Always 1
Photometric interpretation	0028,0004	Fixed MONOCHROME 1
Rows	0028,0010	
Columns	0028,0011	
Bits allocated	0028,0100	16
Bits stored	0028,0101	12
High bit	0028,0102	11
Pixel representation	0028,0103	0 = unsigned 1 = signed
Pixel data	7FE0,0010	

Table 3.12 Image pixel module.

Attribute Name	Tag	Value
Contrast/Bolus agent	0018,0010	User_Info field
Contrast/Bolus volume	0018,1041	User_Info field
Contrast/Bolus total dose	0018,1044	User_Info field

Table 3.13 Contrast/Bolus module.

Attribute Name	Tag	Value
Plate ID (Cassette number)	0018,1004	
Acquisition Device Processing Code (see Note)	0018,1401	
Cassette orientation	0018,1402	PORTRAIT or LANDSCAPE
Cassette size (Plate size)	0018,1403	
Exposures on plate (Usage count)	0018,1404	
Sensitivity (Exposure class)	0018,6000	
KVP	0018,0060	User_Info field
Distance source to detector	0018,1110	User_Info field
Distance source to patient	0018,1111	User_Info field
Exposure	0018,1152	User_Info field
Pixel spacing in patient	0028,0030	

Note:

Format: <ip_menu_nr>la<hardcopy_menu_nr>Ra

Table 3.14 CR image module.

Attribute Name	Tag	Value
Rescale intercept	0028,1052	
Rescale slope	0028,1053	
Rescale type	0028,1054	Must be US (Note 1), OD (Note 2), LOG_E REL (Note 3) or OD REL (Note 4)

Notes:

1. US: Unspecified; used only if data for one of the other types is missing or invalid; in that case, no VOI module is added.
2. OD: DICOM optical densities in multiples of 0.001 density; a VOI module is present, containing a window center and width.
3. LOG_E REL: pixel values are linearly related to the Log Exposure on the image plate; the maximum pixel value corresponds to a delta LogE of 3.2767 above the LogE for the minimum pixel value; in this case, a VOI module (sequenced item) is present, also containing a lookup table.
4. OD REL: the pixel data are strictly proportional to optical densities; the exact relationship is NOT specified, but is guaranteed the form: $d = h.p + z$ with $h > 0.0$, where:
 - d = density value
 - p = pixel value
 - h = slope
 - z = offset
 A VOI module is present, containing a window center and width.

Table 3.15 Modality LUT module.

Attribute Name	Tag	Value
VOI LUT sequence (Note 2)	0028,3010	
>LUT descriptor (table-size, table-zero, table-depth) (Note 3)	0028,3002	
>LUT explanation	0028,3003	
>LUT data	0028,3006	
Window center (Notes 2, 4)	0028,1050	
Window width (Notes 2, 4)	0028, 1051	

Notes:

1. Not present for rescale type US images.
2. Either the sequenced item 0028,3010 or window center/width is present if Rescale type is not US (see Modality LUT Module description).
3. The three values of the LUT Descriptor (0028,3002) describe the format of the LUT Data in the corresponding Data Element (0028,3006).

Table size : The first value is the number of entries in the lookup table.

Table-zero: The second value is the first stored pixel value mapped. This pixel value is mapped to the first entry in the LUT. All image pixel values less than the first entry are also mapped to the first entry in the LUT Data. An image pixel value one greater than the first entry is mapped to the second entry in the LUT Data. Subsequent image pixel values are mapped to the subsequent entries in the LUT Data up to an image pixel value equal to number of entries + first entry - 1 which is mapped to the last entry in the LUT Data. Image pixel values greater than number of entries + first entry are also mapped to the last entry in the LUT Data.

Table-depth: The third value specifies the number of bits for each entry in the LUT Data. It shall take the value 8 or 16. The LUT Data shall be stored in a format equivalent to 8 or 16 bits allocated and high bit equal 1-bits allocated.

The third value conveys the range of LUT entry values. It shall take the value 16, corresponding with the LUT entry value range of 65536.

4. Values for Window center and Window width

Rescale type = OD : Window center = 1600 and Window width = 2800 (OD scaled values)

Rescale type = ODrel : Window center = 2048 and Window width = 4095.

Rescale type = LOG_E REL : Window center and Window width not present.

Table 3.16 VOI LUT module (Note 1).

Attribute Name	Tag	Value
SOP Class UID	0008,0016	1.2.840.10008.5.1.4.1.1.1
SOP Instance UID (Unique identifier)	0008,0018	
Specific character set	0008,0005	ISO_IR 100
Instance creation date	0008,0012	
Instance creation time	0008,0013	

Table 3.17 SOP common module.

Attribute Name	Tag	Value
Imager pixel spacing (Note 1)	0018,1164	
Current patient location (Note 3)	0038,0300	User_Info field

Notes:

1. <row spacing>\<column spacing> in mm. Standard element in X-ray Angiographic image object.
 2. <row spacing>\<column spacing> in mm. Standard element in CT image object. Contains the same data as 001,1164.
 3. Standard element in Visit Status module.
-

Table 3.18 Added standard element.

Attribute Name	Tag	Value
Private Identification Code	0019,0010	Fixed AGFA
Image processing parameters (Note 1)	0019,1010	
Identification data (Note 2)	0019,1011	
Sensitometry name	0019,1013	
Window/Level list (Note 3)	0019,1014	
Dose monitoring list (Note 4)	0019,1015	
Clipped exposure deviation	0019,101A	
Logarithmic plt_full_scale	0019,101B	

Notes:

1. <Has the form MENU=menu CC=cc MC=mc EC=ec LR=lr NR=nr, where:

menu: an integer image processing number.

cc: an integer specifying the collimation configuration.

mc: a real number specifying the Musica contrast.

ec: a real number specifying the edge contrast.

lr: a real number specifying the latitude reduction.

nr: a real number specifying the noise reduction.

2. Has the form x name, where:

x: a one-character ID station identification.

name: an image-identifying string consisting of either pyramidname_version0 or spooling-ID.

3. Has the form W1/L1,W2/L2,...,Wi/Li,Wn/Ln, where:

Wi: the i-th window width specification as a real number

Li: the i-th window level specification as a real number

i: an integer number in the interval [1,n], n being the total number of window/level specifications.

All real numbers are written with 2 digits after the decimal point.

All above undescribed parts must be literally included.

The notation ... means any number of specifications.

4. Has the form D1,D2,...,Di,...,Db, where:

Di: the i-th LgM (DOS) specification as a real number.

i: an integer number in the interval [1,n], n being the total number of LgM (dose) specifications.

All real numbers are written with 2 digits after the decimal point.

The notation ... means any number of specifications.

Table 3.19 Private elements.

3.1.2.2 Real World Activity - Printing

3.1.2.2.1 Associated Real World Activity - Printing

DIPS/VIPS will issue print requests driven by user requests or automated processes.

In case of manual print the following actions need to be performed:

Via the Smart Print Interface:

1. The user opens the FILM COMPOSER or SCRAPBOOK via the Graphical User Interface
2. The appropriate film lay out is selected.
3. The images to be printed shall be dragged and dropped into the FILM COMPOSER or SCRAPBOOK .
4. The user selects the printer destination and starts the print.

Via the view menu:

1. The image viewed will be printed after selecting the print button and initiating the print command.

In case of automated print the print job will be printed according to the routing patterns defined with the CCM tool and initiated at time of identification of the cassette.

3.1.2.2.2 Presentation Context Table - Printing

DIPS/VIPS will request any of the Presentation Contexts listed in Table 3.20 for Print Management.

SOP Class	Transfer Syntax	Role	Extended Negotiation
All Table 3.2	All Table 3.3	SCU	None

Table 3.20 Presentation context for printing.

3.1.2.2.3 SOP-Specific Conformance - Printing

DIPS/VIPS provides standard conformance to the DICOM 3.0 Print Management Service Class by supporting the Basic Grayscale Print Management Meta SOP Class (UID 1.2.840.10008.5.1.1.9).

Printing however from software version 1.0.09 or earlier requires an Agfa specific implementation on the printer side. These software versions use the enumerated value CUSTOM followed by a number specifying the Agfa layout for Image Display Format.

With VIPS 1.1.05 or later the hardcopy destination can be configured as 'non agfa' and the CUSTOM definition will not be used. Instead the STANDARD\C,R definition will always be used with C and R = 1. In case of multiple image layouts the workstation itself will compose the film and send it as a STANDARD\1,1 image.

3.1.2.2.4 SOP-Specific Conformance to Basic Film Session SOP Class

DIPS/VIPS transmits the following attributes of the Basic Film Session SOP Class:

Attribute Name	Tag	Value
Number of Copies	2000,0010	Default 1
Print priority (See Note 1)	2000,0020	Default LOW
Medium Type (See Note 1)	2000,0030	Default BLUE FILM
Film destination (See Note 1)	2000,0040	Fixed PROCESSOR
Film Session Label (See Note 2)	2000,0050	

Note:

1. Values are configurable in the specific printer configuration files (Also see Chapter 5. Configuration).
2. Film Session label 2000,0050 contains the Patient ID (Patient Code in Agfa terminology).

Table 3.21 Attributes for a basic film session.

3.1.2.2.5 SOP-Specific Conformance to Basic Film Box SOP Class

Attribute Name	Tag	Value	
		Agfa Printer only	
Image Display Format	2010,0010	CUSTOM <i>i</i>	STANDARD\1,1
Film Orientation	2010,0040	PORTRAIT/LANDSCAPE	PORTRAIT/LANDSCAPE
Film Size ID	2010,0050	8INX10IN,11X14IN,14X17IN	See Note 2
Magnification Type	2010,0060	Fixed CUBIC	See Note 2
Smoothing Type	2010,0080	Fixed 150	See Note 2
Border Density (See Note 1)	2010,0100	0 -> 500 (Note 1)	
Empty Image Density (See Note 1)	2010,0110	0 -> 500 (Note 1)	
Minimum Density	2010,0120	0 -> 500	See Note 2
Maximum Density	2010,0130	0 -> 500	See Note 2
Trim	2010,0140	Fixed NO	Fixed NO
Configuration Info	2010,0150	PERCEPTION_LUT=LINEAR	See Note 2

Note:

1. The values for Border Density and Empty Image Density are set to the same value.
2. Values are configurable in the specific printer configuration files (Also see Chapter 5. Configuration).

Table 3.22 Attributes for a basic film session.

Attribute Name	Tag	Value
Referenced Film Session	2010,0500	
> Referenced SOP Class	0008,1150	1.2.840.10008.5.1.1.1
> Referenced SOP Instance	0008,1155	

Table 3.23 Basic film box relationship module.

3.1.2.2.6 SOP-Specific Conformance to Basic Grayscale Image Box SOP Class

Attribute Name	Tag	Value
Image Position	2020,0010	
Polarity	2020,0020	Default NORMAL
Requested Image Size	2020,0030	Line size in mm (see Note 1)
Pre-formatted Grayscale Image Sequence	2020,0110	
> Samples per pixel	0028,0002	Fixed 1
>Photometric Interpretation	0028,0004	Fixed MONOCHROME1
> Rows	0028,0010	See Note 3
> Columns	0028,0011	See Note 3
> Pixel Aspect Ratio	0024,0034	See Note 2
> Bits Allocated	0026,0100	8 (See Note 4)
> Bits Stored	0028,0101	8 (See Note 4)
> High Bit	0028,0102	7 (See Note 4)
> Pixel Representation	0028,0103	Fixed 0 for unsigned
> Pixel Data	7FE0,0010	VR is OB

Note:

1. Requested Image Size is only provided if true-size printing is required.
2. Pixel Aspect Ratio is provided if the aspect ratio is not 1:1.
3. In case of printing to 'Non Agfa Printers' (no support of Agfa mg3 layouts) rows and columns are configurable in the printer configuration file. Also see chapter 5.
4. Also 12 bit printing is possible, configurable in the adc.cpf file or the printer configuration file for 'Non Agfa printers'.

Table 3.24 Attributes for a basic grayscale image box.

3.1.2.2.7 SOP-Specific Conformance to Printer SOP Class

Except for the command itself (N-GET), no data is transmitted to the SCP. The command is sent only once. The following attributes are requested (Printer Status Info only if Printer Status is equal to the string WARNING):

Attribute Name	Tag
Printer Status	2110,0010
Printer Status Info	2110,0020

Table 3.25 Attributes for printer.

3.1.2.2.8 Flow of Control

- ▶ **A-ASSOCIATE-RQ**
- ▶ **N-GET-RQ** (Printer SOP Instance)
- ▶ **N-CREATE-RQ** (Film Session SOP Instance)
 - The command is sent only once.
 - A response without any data but with the status SUCCESS is expected.
- ▶ **N-CREATE-RQ** (Film Box SOP Instance)

The command is send only once. For the Agfa imagers using the mg3 lay outs the Image Display Format (2010,0010) will have a value like "CUSTOM\701" where 701 is the Agfa lay out number. For imagers that do support the mg3 lay outs, the Image Display Format (2010,0010) will always have a value "STANDARD\1,1".

 - A response with status SUCCESS is expected from the SCP containing the following items:
 - (2010,0510) Referenced Image Box Sequence
 - >(0008,1150) SOP Class UID (Ignored by SCU)
 - >(0008,1150) SOP Instance UID
 - The received SOP Instance UIDs are stored in an array and later used when sending individual images.
- ▶ **N-SET-RQ** (Grayscale Image Box SOP Instance).
 - The command is sent once for each image on the film. In case of printing to Agfa imagers supporting the mg3 lay outs, two images are created and transmitted, the actual (medical) image and a Flat field with superimposed text consisting of patient and image information and some processing parameters. In case of printing to imagers that do not support the mg3 lay outs, only one image is transmitted.
 - A response without any data but with the status SUCCE is expected.
- ▶ **N-ACTION-RQ** (Film Box SOP Instance).
 - The command is transmitted to the SCP without any data but indicating that the PRINT operation is to be performed. The command is sent only once.
 - A response without any data but with status SUCCESS is expected.
- ▶ **N-DELETE-RQ** (the N-DELETE message is not transmitted when printing to Agfa imagers using mg3 lay outs)
- ▶ **A-RELEASE-RQ**

3.1.3 Association Acceptance Policy

3.1.3.1 Real World Activity - Storage

3.1.3.1.1 Associated Real World Activity - Storage

The DIPS/VIPS workstation will perform the role of SCP for the ADC digitizer. Upon entering a cassette into the digitizer the image read will be send as a DICOM store object to the DIPS/VIPS. Only the SOP Class Computed Radiography Image Storage is supported. The supported SOP Class conforms to a Standard Extended SOP Class, as defined in Part 2 of the DICOM 3.0 Standard. Therefore, the standard SOP Class

UID for Computed Radiography Image Storage can still be employed. Although the following describes the SCP role of the DIPS/VIPS it also reflects the SCU role of the digitizer.

3.1.3.1.2 Presentation Context Table - Storage

DIPS/VIPS will accept any of the Presentation Contexts listed in Table 3.26 for Storage.

SOP Class	Transfer Syntax	Role	Extended Negotiation
All Table 3.2	All Table 3.3	SCP	Not supported

Table 3.26 Presentation context for storage.

3.1.3.1.3 SOP Specific Conformance - Storage

DIPS/VIPS conforms to the DICOM Storage Service Class at Level 1.

Note that the elements of the Patient Study Module are not present in the object sent by the digitizer.

In the event of a successful C-STORE operation, the image has been written to internal storage, and can be retrieved at any later time.

3.1.3.1.4 Presentation Context Acceptance Criterion - Storage.

Not applicable.

3.1.3.1.5 Transfer Syntax Selection Policies - Storage.

Not applicable.

3.1.3.1.6 SOP Specific Conformance - Storage

The following is an overview of the transmitted/received DICOM items. The column EU (Element Usage) is added to clarify the usage by the DIPS/VIPS; the following codes are used:

- M1 Mandatory element; used as received.
- M2 Mandatory element; contents are ignored.
- M3 Mandatory element; must be equal to a predefined constant or an error is reported and the processing aborted.
- M4 Mandatory element; must be equal to a predefined constant or a warning is issued; the processing continues.
- 01 Optional element; used as received, if applicable.
- 02 Optional element; contents are ignored.
- 07 optional element; a predefined default value is used if the element is empty or absent.
- 08 optional element; a predefined default value is always used; received data are ignored.

Attribute Name	Tag	Value
Patient's name	0010,0010	Default UNKNOWN^UNKNOWN
Patient ID	0010,0020	Default 0 (zero)
Patient's birth date	0010,0030	Default 00010101
Patient's sex	0010,0040	Default O (capital "O")

Table 3.27 Patient module.

Note

The following Type 2 elements of the Patient module are not present in the object sent by the digitizer:

(0010,1000) "Other Patient IDs"

(0010,2160) "Ethnic Group"

(0010,4000) "Patient Comments"

Attribute Name	Tag	Value
Study instance UID	0020,000D	
Study date	0008,0020	
Study time	0008,0030	
Referring physician's name	0008,0090	Default UNKNOWN
Study ID	0020,0010	
Accession number (RIS ID)	0008,0050	
Study description (Exam type)	0008,1030	Default ?

Table 3.28 General study module.

Attribute Name	Tag	Value
Modality	0008,0060	Assumed CR
Series description (Exam subtype)	0008,103E	Default ?
Series instance UID	0020,000E	
Series sequence number (Original No.)	0020,0011	Default 1
Laterality	0020,0060	
Performing physician's name (Radiologist)	0008,1050	Default UNKNOWN

Table 3.29 General series module.

Attribute Name	Tag	Value
Body part examined	0018,0015	
View position	0018,5101	Default AP
Screen type (Plate type)	0018,1260	

Table 3.30 CR-series module.

Attribute Name	Tag	Value
Manufacturer	0008,0070	Fixed AGFA
Institution name (Institution ID, Hospital name)	0008,0080	
Station name (User-defined digitizer name)	0008,1010	
Device serial number	0018,1000	
Institutional department name	0008,1040	
Manufacturer's model name	0008,1090	ADC_5145 for ADC Compact ADC_51xx for ADC Solo
Software versions	0018,1020	

Table 3.31 General equipment module.

Attribute Name	Tag	Value
Image type (See Note 1)	0008,0008	Assumed ORIGINAL/SECONDARY
Acquisition (Identification) date	0008,0022	Default 00010101
Acquisition (Identification) time	0008,0032	Default: 000000
Patient orientation	0020,0020	
Image sequence number	0020,0013	Default 1
Image comment (see Note 2)	0020,4000	

Note:

1. ORIGINAL/SECONDARY are not Enumerated Values.
2. Format: <Comment proper>^<User info 1>^ ... ^<User info N>

Table 3.32 General image module.

Attribute Name	Tag	Value
Samples per pixel/Number of planes	0028,0002	Assumed 1
Photometric interpretation	0028,0004	Assumed MONOCHROME
Rows	0028,0010	
Columns	0028,0011	
Bits allocated	0028,0100	Must be equal to 16
Bits stored	0028,0101	Must be equal to 12
High bit	0028,0102	Must be equal to 11
Pixel representation	0028,0103	Assumed 0 (unsigned)
Pixel data	7FE0,0010	

Table 3.33 Image pixel module.

Attribute Name	Tag	Value
Plate ID (Cassette ID)	0018,1004	
DIG Acquisition Device processing Code (ID menu No.)	0018,1401	
Cassette orientation	0018,1402	
Cassette size	0018,1403	
Exposures on plate (Usage count)	0018,1404	
Sensitivity (Exposure class)	0018,6000	

Table 3.34 CR image module.

Attribute Name	Tag	Value
Rescale intercept	0028,1052	Assumed 0.0
Rescale slope	0028,1053	Assumed 1.0
Rescale type	0028,1054	Assumed SQRT_E REL (see Note)

Note:

Pixel values are linearly related to the Log Exposure on the image plate.

Table 3.35 Modality LUT module.

Attribute Name	Tag	Value
SOP Class UID	0008,0016	Fixed 1.2.840.10008.5.1.4.1.1
SOP Instance UID (Unique identifier)	0008,0018	
Character set	0008,0005	Assumed ISO_IR 100
Instance creation date	0008,0012	
Instance creation time	0008,0013	

Table 3.36 SOP common module.

Attribute Name	Tag	VR	TE	Value	EU
Imager pixel spacing (see Note)	0018,1164	DS	3		01

Note:

Format: <row spacing>\<column spacing>; data in mm.

Table 3.37 Added standard elements.

Attribute Name	Tag	VR	TE	Value	EU
Private Identification Code	0019,0010	LO	1	Fixed AGFA_ADC_Compact	M3
Data stream from cassette	0019,1005	ST	3		M1
Set of destination types (Note 1)	0019,1030	ST	3		01
Set of destination Ids (Note 1)	0019,1040	ST	3		01
Set of processing codes (Notes 1 & 2)	0019,1050	ST	3		01
Number of series in study	0019,1060	US	3	Default 1	07
Session No.	0019,1061	US	3	Default 0	07
ID station name	0019,1062	SH	3	Default #	07
Number of images in series	0019,1070	US	3	Default 1	07
Break condition	0019,1071	US	3	Default 0	07
Wait (or Hold) flag	0019,1072	US	3	Default 0	07
ScanRes flag;	0019,1073	US	3	Default 1	07
Operation code	0019,1074	SH	3	Default NO	07
Image quality	0019,1095	CS	3	Default 0	07

Notes:

1. Possible multiple items separated by “^”.
2. Only used for hardcopy: <layout_nr>,<copycount>.

Table 3.38 Private elements.**4 COMMUNICATION PROFILES**

- ▶ The DIPS/VIPS workstation provides DICOM 3.0 TCP/IP network communication support, as defined in Part 8 of the DICOM standard.
- ▶ The SCP will listen for connections on a configurable port number.

5 CONFIGURATION

VIPS obtains its configuration information from the following sources:

- ▶ The adc.cpf file provides configuration settings for network, application, mapping, Creating the adc.cpf file requires a configuration tool (CCM) and extensive knowledge of the system. Configuration of the adc.cpf file is out of the scope of this document.
- ▶ Printer specific configuration is obtained from dedicated files (printer related parameters) for validated printers that are configurable via the configuration tool (CCM). These files are located in the /home/mimosa/irc/local/Hardcopy/printers.

6 SUPPORT FOR EXTENDED CHARACTER SETS

The Application Entity specifies ISO_IR 100 as extended character set. Any character sent with the high bit ON will be interpreted by the SCP as a Latin Alphabet 1 character (ISO 8859-1).

7 AE TITLE/PRESENTATION ADDRESS MAPPING

The adc.cpf file provides mapping from AE title to Presentation Address

8 ACRONYMS AND ABBREVIATIONS

The following symbols and abbreviations are used in this conformance statement:

ACR	American College of Radiology
ADC	Agfa Diagnostic Center
AE	Application Entity
CR	Computed Radiography
DICOM	Digital Imaging and Communications in Medicine
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
RIS	Radiology Information System
SCP	Service Class Provider
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier