

**Philips Medical Systems
DICOM Conformance Statement**

**Inturis Online R2.1
InDirect Serve Interface (IDS)
DICOM Store, Query/retrieve**

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1 Introduction

This chapter provides general information about the purpose, scope and contents of this Conformance Statement.

1.1 Scope and field of application

The scope of this DICOM Conformance Statement is to facilitate data exchange with equipment of Philips Medical Systems. This document specifies the compliance to the DICOM standard (formally called the NEMA PS 3.X-1996 standards). It contains a short description of the applications involved and provides technical information about the data exchange capabilities of the equipment. The main elements describing these capabilities are: the supported DICOM Service Object Pair (SOP) Classes, Roles, Information Object Definitions (IOD) and Transfer Syntaxes.

The field of application is the integration of the Philips Medical Systems equipment into an environment of medical devices.

This Conformance Statement should be read in conjunction with the DICOM standard and its addenda [DICOM]. The conformance to the DICOM standard is a key element of the Inturis Program (see [INTURIS]).

1.2 Intended audience

This Conformance Statement is intended for:

- (potential) customers,
- system integrators of medical equipment,
- marketing staff interested in system functionality,
- software designers implementing DICOM interfaces.

It is assumed that the reader is familiar with the DICOM standard.

1.3 Contents and structure

The DICOM Conformance Statement is contained in chapter 2 through 7 and follows the contents and structuring requirements of DICOM PS 3.2-1996.

1.4 Used definitions, terms and abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3-1996 and PS 3.4-1996.

The word Philips in this document refers to Philips Medical Systems.

1.5 References

- [DICOM] The Digital Imaging and Communications in Medicine (DICOM) standard:
NEMA PS 3.X 1996
National Electrical Manufacturers Association (NEMA) Publication Sales
1300 N. 17th Street, Suite 1847
Rosslyn, Va. 22209, United States of America

[INTURIS] Inturis for Cardiology
On-Line Image Access
Doc. nr. 4522 982 69681
Philips Medical Systems Nederland BV

[EV REL BUL] EasyVision Release Bulletin, Document Number 4522 220 84541
Easy Vision Modules (EVM)
Philips Medical Systems Nederland B.V. (see address at page ii)

1.6 Important note to the reader

This Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**

Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a networked environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment. It is the user's responsibility to analyse thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**

Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.

Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**

The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.

The user should ensure that any non-Philips provider linking to Philips equipment, also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

1.7 General Acronyms and Abbreviations.

The following acronyms and abbreviations are used in the document.

- ACC American College of Cardiology
- AE Application Entity
- ACR American College of Radiology
- ANSI American National Standard Institute
- BOT Basic Offset Table
- CD-R CD Recordable
- CD-M CD Medical
- DCI Digital Cardio Imaging
- DCR Dynamic Cardio Review
- DICOM Digital Imaging and Communication in Medicine
- DIMSE DICOM Message Service Element
- DIMSE-C DICOM Message Service Element-Composite
- DIMSE-N DICOM Message Service Element-Normalized
- ELE Explicit VR Little Endian
- EBE Explicit VR Big Endian
- FSC File Set Creator
- GUI Graphic User Interface
- HIS Hospital Information System
- HL7 Health Level Seven
- ILE Implicit VR Little Endian
- ELE Explicit VR Little Endian
- IOD Information Object Definition
- ISIS Information System - Imaging System
- NEMA National Electrical Manufacturers Association
- PDU Protocol Data Unit
- RIS Radiology Information System
- RWA Real World Activity
- SC Secondary Capture
- SCM Study Component Management
- SCP Service Class Provider
- SCU Service Class User
- SOP Service Object Pair
- TCP/IP Transmission Control Protocol/Internet protocol
- UID Unique Identifier
- WLM Worklist Management

2 Implementation model

This document provides the DICOM Conformance Statement for the Philips Medical Systems Inturis Online InDirect Service Interface DICOM Server (IDS) product. Its purpose is to allow users of IDS to determine which optional components of the DICOM Standard are supported, including Service Classes, SOP Classes, communication protocols, roles, optional (Type 3) Attributes, etc.

The output of the IDS is described as it is connected to the Integris or DCI system.

2.1 Application Data Flow Diagram

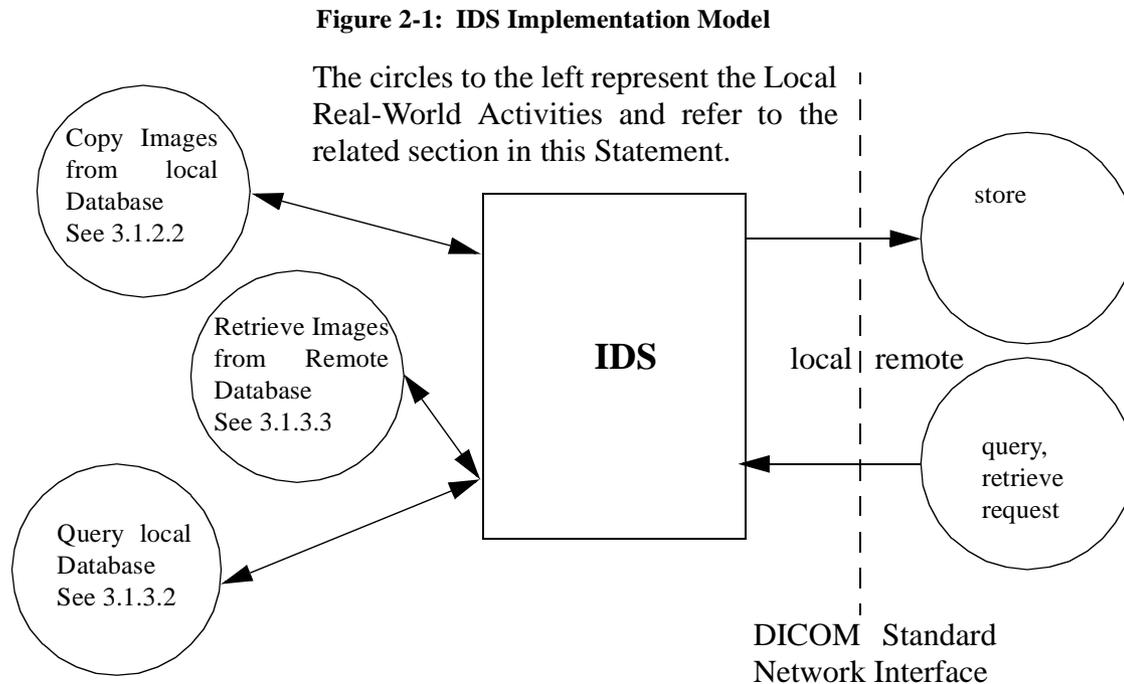
The IDS system behaves as a single Application Entity. Its related Implementation Model is shown in Figure 2-1 on page 4.

2.2 Functional definition of Application Entities

The IDS Application Entity acts as a Service Class User (SCP) of Query/Retrieve and as a Service Class User of C-STORE.

2.3 Sequencing of Real World Activities

All Real-World Activities as specified in Figure 2-1 may occur independently from each other.



3 AE Specifications

The Network capabilities of the IDS DICOM Application Entity are specified in section 3.1.

3.1 IDS AE Network Specification

The IDS Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCU specified in Table 3-1.

Table 3-1: Supported SOP classes by the IDS AE as SCU

SOP class Name	UID
Verification	1.2.840.10008.1.1
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1

Table 3-2: Supported SOP classes by the IDS AE as SCP

SOP class Name	UID
Verification	1.2.840.10008.1.1
Study Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

3.1.1 Association Establishment Policies

3.1.1.1 General

The IDS will always propose the DICOM Application Context Name (ACN) which is:
Application Context Name: 1.2.840.10008.3.1.1.1

The maximum PDU length accepted by the IDS is configurable.

3.1.1.2 Number of Associations

The maximum number of simultaneous associations supported by the IDS is configurable.

3.1.1.3 Asynchronous Nature

IDS does not support asynchronous operations and will not perform asynchronous window negotiation.

3.1.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.2.840.113697.6.8

The implementation version name is: "IDS-IDRS_v1.0"

3.1.2 Association Initiation Policy

IDS initiates Associations as a result of the following events:

- To transfer an image in response to a retrieve request initiated by the remote DICOM AE.

3.1.2.1 Real-World Activity *Verify Communication With Remote AE*

3.1.2.1.1 Associated Real-World Activity

A service operator invokes a command from the IDS console using the IDS_Config configuration tool to verify communications with a remote DICOM AE. The operator selects the Remote AE to be verified.

3.1.2.1.2 Proposed Presentation Contexts

The following table presents the Presentation Contexts, which are proposed by the IDS-STORAGE for Real-World Activity *Verify Communication with Remote AE*:

Table 3-3: Proposed Presentation Contexts for IDS to Other

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE	1.2.840.10008.1.2	SCU	None

Note: Verification see: Table 3-1

3.1.2.1.3 SOP Specific Conformance for Verification SOP Class

The IDS AE's provide standard conformance to the Verification SOP class.

3.1.2.2 Copy Images from IDS (i.e. Image Export)

3.1.2.2.1 Associated Real-World Activity

After a retrieve request is received from a remote DICOM AE, the IDS will initiate a new association with a DICOM AE provided in the retrieve request. The images will be transferred to this AE for storage.

3.1.2.2.2 Proposed Presentation Contexts

IDS will propose the following presentation contexts:

Table 3-4: Proposed Presentation Contexts for IDS to Other

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE	1.2.840.10008.1.2	SCU	None
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE	1.2.840.10008.1.2	SCU	None
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless, Hierarchical, First Order Prediction	1.2.840.10008.1.2.4.70	SCU	None

3.1.2.2.3 SOP Specific Conformance for SOP Class Image Storage

The SOP Specific Conformance for the Image Storage SOP Class is detailed here.

When a “Success”(0000) or “Warning”(Bxxx) response status to a C-STORE operation is received by the IDS AE, the transmission is assumed to be successful.

In the case of a “Warning” status, the exact status returned by the remote AE is logged in the IDS event log.

When a “Refused” or “Error” response status to a C-STORE operation is received by the IDS AE, an error status is logged in the IDS event log.

IDS AE will release the association after all the images associated with a single study have been successfully transmitted to the destination AE, or a fatal error is detected while performing the store operation.

See chapter 8 for extended information on the content of the XA object.

Table 3-5: Applied Conditional and Optional Attributes of the XA Image IOD

Information Entity	Module	Conditional Attributes	Optional Attributes
Patient	Patient	-	-
Study	General Study	-	Study Description
	Patient Study	-	Patient’s Size, Patient Weight
Series	General Series	Laterality	Performing Physician’s Name
Equipment	General Equipment	-	Institution Name, Institution Address, Station Name

Table 3-5: Applied Conditional and Optional Attributes of the XA Image IOD

Information Entity	Module	Conditional Attributes	Optional Attributes
Image	General Image	Image Date, Image Time, Patient Orientation	Referenced Image Sequence, Acquisition Number, Image Comments.
	Image Pixel	Pixel Aspect Ratio	-
	Cine	-	Frame Time
	Multi-frame	-	-
	Frame Pointers	-	Representative Frame Number
	Display Shutter	Shutter Left Vertical Edge, Shutter Right Vertical Edge, Shutter Upper Horizontal Edge, Shutter Lower Horizontal Edge, Center of Circular Shutter, Radius of Circular Shutter	-
	XA Image	Frame Increment Pointer, High Bit	Calibration Object
	SOP Common	Specific Character Set	Instance Creator UID

Table 3-6: Applied Conditional and Optional Attributes of the SC Image IOD

Information Entity	Module	Conditional Attributes	Optional Attributes
Patient	Patient	-	-
Study	General Study	-	Study Description
	Patient Study	-	Patient's Size, Patient's Weight
Series	General Series	-	Performing Physicians(s) Name
Equipment	General Equipment	-	-
	SC Equipment	-	-
Image	General Image	-	Image Type, Image Comments
	Image Pixel	Aspect Ratio	-
	SOP Common	Specific Character Set	Instance Creator UID

3.1.3 Association Acceptance Policy

IDS accepts Associations for the following purposes:

- A remote DICOM AE want to query the IDS database, see section 3.1.3.2 on page 9.
- A remote DICOM AE wants to retrieve image data form the IDS.

Any of the presentation contexts shown in Table 3-4 are acceptable.

3.1.3.1 Real-World Activity *Verify Communication For Remote AE*

The IDS AE will respond automatically to Verification requests from Remote AE's to provide an SCU with verification that the IDS- AE's are able to receive DICOM requests. An operator at the Remote AE typically initiates this.

3.1.3.1.1 Presentation Context Table

The following table presents the Presentation Contexts, which are acceptable by the IDS-STO-AGE for Real-World Activity *Verify Communication with Remote AE*:

Table 3-7: Proposed Presentation Contexts for IDS to Other

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE	1.2.840.10008.1.2	SCU	None

Note: Verification see: Table 3-2

3.1.3.1.2 SOP Specific Conformance for Verification SOP Class

The IDS AE's provide standard conformance to the Verification SOP class.

3.1.3.1.3 Presentation Context Acceptance Criterion

Not applicable.

3.1.3.1.4 Transfer Syntax Selection Policies

Not applicable.

3.1.3.2 Query the IDS Database

3.1.3.2.1 Associated Real-World Activity

COM AE to query patient data information available in the IDS.

IDS accepts Associations from systems that wish to query the IDS database using the C-FIND command.

3.1.3.2.2 Presentation Context Table

The following table presents the Presentation Contexts, which are acceptable to the IDS for

Real-World Activity Query Patient data:

Table 3-8: Proposed Presentation Contexts for IDS to Other

Presentation Context table							
Abstract Syntax				Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List				
Study Root Query/ Retrieve Information Model	1.2.840.10008.5.1. 4.1.2.2.1	ILE	1.2.840.10008.1.2	SCU	None		

3.1.3.2.3 SOP Specific Conformance for Study Root Query (C-FIND) SOP Class

The SOP Specific Conformance for the Storage SOP Class is detailed here.

When a “Success”(0000) or “Warning”(Bxxx) response status to a C-STORE operation is received by the IDS AE, the transmission is assumed to be successful.

In the case of a “Warning”status, the exact status returned by the remote AE is logged in the IDS event log. When a “Refused”or “Error”response status to a C-STORE operation is received by the IDS AE, an error status is logged in the IDS event log. IDS AE will release the association after all the images associated with a single study have been successfully transmitted to the destination AE, or a fatal error is detected while performing the store operation.

IDS Supports Range Matching for Study Date and Study Time as independent keys. Thus, IDS does not treat the combination of specified matching ranges in these two fields as a date-time range (study date-time between date1-time1 and date2-time2).

IDS supports Performing Physician’s Name as a matching attribute at the Study Level, even though it is formally defined in the DICOM Information Model as an attribute at the Series Level.

At Study Level, IDS recognizes and returns the private key Attributes, Media Location (0087, 1020), Study Status (0087,1030) and Study Size (0087,1040) in accordance with the Extensions to the Standard C-FIND SOP Classes as described in See 5.1. The current implementation of IDS requires that the Private elements creator must always be encoded in the Slot described by element (0087, 0010).

For a Series Level Query, IDS will always respond with a zero matching responses. (IDS is interfacing with a Legacy Patient Data system, which does not support series level.)

The IDS will return status in the C-FIND response in accordance with the DICOM standard. In particular the IDS will return Refused or Failed status response in accordance with the follow-

ing Table.

Table 3-9: Study Level Keys supported by IDS for Study Root Query Information Model

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Study Instance UID	0020,000D	
Study Date	0008,0020	
Study Time	0008,0030	
Accession Number	0008,0050	
Performed Physician's Name	0008,1050	
Patient ID	0010,0020	
Patient's Name	0010,0010	The '\ ' character should not be used.
Study ID	0020,0010	
Patient's Birth Date	0010,0030	
Patient's Sex	0010,0040	
Number of Study Related Images	0020,1208	
Media Location	0087,1020	
Study Status	0087,1030	
Study Size in megabytes	0087,1040	

Table 3-10: C-FIND Response Statuses

<i>Status Value</i>	<i>Status Class</i>	<i>Meaning/recovery Action</i>
0000	Success	
A700	Refused	Out of resources - Max Entries exceeded
C021	Failed	Unable to process - NCL Link down or Unable to communicate with Working Storage Controller or Archive Manager.
C023	Failed	Unable to process - Support only Study Level Query
C020	Failed	Unable to process - Not licensed to perform this operation.
C035	Failure	Unable to process - Local database error.
C036	Failure	Unable to process - Internal error.
C024	Failure	Unable to process - No entries found matching the current criterion

The IDS AE limits the maximum number of Query responses returned with status of pending (response code FF00 or FF01) to the value of a parameter set in the configuration file. The default Maximum Number of Query Responses value is 100. After the maximum number of pending responses, the IDS returns a response with a status Failed: Max entries exceeded (response code C003)

The IDS AE limits the maximum number of Query responses returned with a status of pending (response code FF00 or FF01) to the value of 100. This value is not configurable and does not change.

3.1.3.3 Real-World Activity Retrieve Study Data from the online Storage.

3.1.3.3.1 Associated Real-World Activity

The IDS will accept an Association request from a remote Application entity to retrieve a study from the IDS AE. The requested study will be moved the Application entity specified in the request.

3.1.3.3.2 Presentation Context Table

The following table presents the Presentation Contexts, which are acceptable to the IDS for Real-World Activity **Retrieve Study Data from the Online Storage**.

Table 3-11: Proposed Presentation Contexts for Retrieve Study Data from the Online Storage

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Move	1.2.840.10008.5.1.4.1.2.2.2	ILE	1.2.840.10008.1.2	SCP	None

3.1.3.3.2.1 SOP Specific Conformance for Study Root Retrieve (C-MOVE)

The IDS conforms to the Study Root Retrieve (C-MOVE) SOP class, in accordance with the DICOM standard. The Study Root Retrieve SOP class allows retrieves against the Study Root information model as defined by the DICOM standard.

Table 3-12: C-MOVE Response Codes

<i>Status Value</i>	<i>Status Class</i>	<i>Meaning/recovery Action</i>
0000	Success	
A701	Refused	Out of Resources - Unable to calculate number of matches. STL link is down or translation failed.
A801	Refused	Out of resources - Inable to perform sub-operations
C030	Refused	Move destination unknown

Table 3-12: C-MOVE Response Codes (Continued)

<i>Status Value</i>	<i>Status Class</i>	<i>Meaning/recovery Action</i>
C031	Failure	Unable to process - retrieve request queued.
C032	Failure	Unable to process - Study is available on IDS.
C033	Failure	Unable to process - media insertion required
C034	Failure	Unable to process - Local parse failed.
C035	Failure	Unable to process - Local database error.
C036	Failure	Unable to process - Internal error.

The IDS does not support relational retrieves and hence does not support extended negotiations.

The IDS Uses the Storage SOP Classes defined in Section 2.1.2.2.2 to support the C-STORE sub-operations of the Retrieve SOP Classes.

3.1.3.3.3 Presentation Context Acceptance Criterion

Not applicable.

3.1.3.3.4 Transfer Syntax Selection Policies

Not applicable.

4 Communication Profiles

4.1 Supported Communication Stacks

The IDS provides only DICOM V3.0 TCP/IP Network Communication Support as specified in PS3.8 (DICOM Part 8). Neither the OSI nor point-to-point stacks are supported with this implementation.

4.2 TCP/IP Stack

The TCP/IP stack used by this implementation is inherited from the Microsoft Windows NT operating system on which it executes.

4.2.1 Physical Media Support

The IDS provides support for DICOM Network Communication on the following physical media:

- IEEE 802.3-1995 (Fast Ethernet) 100BASE-TX.
- IEEE 802.3-1995 10BASE-TX

5 Extensions/Specializations/Privatizations

5.1 Standard Extended Query SOP Class

The IDS AE provides Standard Extended Conformance to the supported DICOM Query SOP classes as a SCP. The extension occurs to provide support for private attributes.

Table 5-1: C-MOVE Response Codes

<i>Attribute</i>	<i>Tag</i>	<i>VR</i>	<i>VM</i>	<i>Notes</i>
Private Data Element Creator	0087,00xx	LO	1	
Media Location	0087,xx20	CS	1	Defines Terms: ONLINE – Media is the online server NEARLINE – Media is in jukebox OFFLINE – Media must be manually loaded into jukebox
Study Size	0087,xx40	UL	1	Size of the study rounded to the next megabyte.
Study Status	0087,xx30	CS	1	Defined Terms: STATUS_OPEN – The Study is not available. STATUS_COMPLETED – The study is available STATUS_ARCHIVED – The Study is archived. STATUS_NONE – A status can not be categorized.

- When an image has no value for the Patient Birthdate, the IDS sends outan illegal value for the date (16 zero's). This will be solved in thenext software release.
- When an image has no Study Date, the IDS will not send put the image. The reason for this behaviour is that the SOP Instance UID uses theStudy Date.

6 Configuration

The IDS maintains configuration data on local disk storage. A service personnel operator may configure the IDS using the local IDS_Config configuration tool.

6.1 AE Title/Presentation Address mapping

Both the AE's are configurable. The IP addresses and TCP Listen ports associated with these AE's are also configurable.

The AE Title, IP address and TCP Listen port for each remote DICOM AE are configurable on the IDS.

The mapping of AE Titles to TCP/IP addresses and ports is kept in the Host Map file and can be edited using a standard text editor such as the Windows Notepad accessory application. The filename and location of the Host Map file are configurable.

6.2 Configurable parameters

- Time-outs: Association (ARTIM) Timer (default = 30 seconds),
- Command Read Timer (default = 300 s)
- Command Write Timer (default = 300 s)
- Data Read Timer (default = 300 s)
- Data Write Timer (default = 300 s)
- Open Connection Timer (default = 20 s)
- Close Connection Timer (default = 20 s)
- Maximum PDU length: SCP (default = 0 Kbytes), SCU (default = 0 Kbytes)
- Number of Simultaneous Associations (default = 50)

7 Support of Extended Character Sets

IDS supports Extended Character Set "ISO_IR 100" which is the Latin alphabet No 1, supplementary set.

8 Overview

8.1 Applied XA Image IOD

The modules selected from the XA Image IOD module table of DICOM and the modules extended are given in the table below.

Table 8-1: Applied Conditional and Optional Attributes of the XA Image IOD

Information Entity	Module	Usage	Reference
Patient	Patient	M	Table 8-2
Study	General Study	M	Table 8-3
	Patient Study	U	Table 8-4
Series	General Series	M	Table 8-5
Equipment	General Equipment	M	Table 8-6
Image	General Image	M	Table 8-7
	Image Pixel	M	Table 8-8
	Cine	C	Table 8-9
	Multi-frame	C	Table 8-10
	Frame Pointers	U	Table 8-11
	Display Shutter	U	Table 8-12
	XA Image	M	Table 8-13
	XA Acquisition	M	Table 8-14
	SOP Common	M	Table 8-15

Table 8-2: X-Ray Angiographic Image Storage SOP Class - Patient Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Patient's Name	0010,0010	The '\ ' character should not be used.
Patient ID	0010,0020	
Patient's Birth Date	0010,0030	
Patient's Sex	0010,0040	

Table 8-3: X-Ray Angiographic Image Storage SOP Class - General Study Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Study Date	0008,0020	
Study Time	0008,0030	
Accession Number	0008,0050	
Referring Physician's Name	0008,0090	
Study Description	0008,1030	
Study Instance UID	0020,000D	
Study ID	0020,0010	

Table 8-4: X-Ray Angiographic Image Storage SOP Class - Patient Study Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Patient's Size	0010,1020	
Patient's Weight	0010,1030	

Table 8-5: X-Ray Angiographic Image Storage SOP Class - General Series Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Modality	0008,0060	Applied value(s): XA
Performing Physician's Name	0008,1050	
Series Instance UID	0020,000E	
Series Number	0020,0011	
Laterality	0020,0060	

Table 8-6: X-Ray Angiographic Image Storage SOP Class - General Equipment Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Manufacturer	0008,0070	Name in In-Lab Acq. System OEM.

Table 8-6: X-Ray Angiographic Image Storage SOP Class - General Equipment Module (Continued)

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Institution Name	0008,0080	Configured with IDS.
Institution Address	0008,0081	Configured with IDS.
Station Name	0008,1010	Lab room ID.

Table 8-7: X-Ray Angiographic Image Storage SOP Class - General Image Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Image Date	0008,0023	
Image Time	0008,0033	
Referenced Image Sequence	0008,1140	
Acquisition Number	0020,0012	
Image Number	0020,0013	
Patient Orientation	0020,0020	
Image Comments	0020,4000	

Table 8-8: X-Ray Angiographic Image Storage SOP Class - Image Pixel Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Rows	0028,0010	
Columns	0028,0011	
Pixel Aspect Ratio	0028,0034	
Pixel Data	7FE0,0010	

Table 8-9: X-Ray Angiographic Image Storage SOP Class - Cine Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Frame Time	0018,1063	

Table 8-10: X-Ray Angiographic Image Storage SOP Class - Multi-frame Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Number of Frames	0028,0008	

Table 8-11: X-Ray Angiographic Image Storage SOP Class - Frame Pointers Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Representative Frame Number	0028,6010	Frame number 33 into the image.

Table 8-12: X-Ray Angiographic Image Storage SOP Class - Display Shutter Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Shutter Shape	0018,1600	Applied value(s): CIRCULAR, RECTANGULAR/CIRCULAR, RECTANGULAR
Shutter Left Vertical Edge	0018,1602	
Shutter Right Vertical Edge	0018,1604	
Shutter Upper Horizontal Edge	0018,1606	
Shutter Lower Horizontal Edge	0018,1608	
Center of Circular Shutter	0018,1610	
Radius of Circular Shutter	0018,1612	

Table 8-13: X-Ray Angiographic Image Storage SOP Class - X-Ray Image Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Image Type	0008,0008	Applied value(s): ORIGINAL \ PRIMARY \ BIPLANE A, BIPLANE B, SINGLE PLANE
Samples per Pixel	0028,0002	Applied value(s): 1
Photometric Interpretation	0028,0004	Applied value(s): MONOCHROME2
Frame Increment Pointer	0028,0009	
Bits Allocated	0028,0100	Applied value(s): 8

Table 8-13: X-Ray Angiographic Image Storage SOP Class - X-Ray Image Module (Continued)

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Bits Stored	0028,0101	Applied value(s): 8
High Bit	0028,0102	Applied value(s): 8
Pixel Representation	0028,0103	Applied value(s): 0
Pixel Intensity Relationship	0028,1040	Applied value(s): DISP
Calibration Object	0050,0004	

Table 8-14: X-Ray Angiographic Image Storage SOP Class - X-Ray Acquisition Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Radiation Setting	0018,1155	Applied value(s): GR

Table 8-15: X-Ray Angiographic Image Storage SOP Class - SOP Common Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Specific Character Set	0008,0005	Applied value(s): ISO_IR 100
Instance Creator UID	0008,0014	Applied value(s): 1.2.840.113697.6.3 + Unit serial number
SOP Class UID	0008,0016	Applied value(s): 1.2.840.10008.5.1.4.1.1.12.1
SOP Instance UID	0008,0018	

8.2 Applied SC Image IOD

The modules selected from the SC Image IOD module table of DICOM and the modules extended are given in the table below.

Table 8-16: Applied Conditional and Optional Attributes of the SC Image IOD

Information Entity	Module	Usage	Reference
Patient	Patient	M	Table 8-17
Study	General Study	M	Table 8-18
	Patient Study	U	Table 8-19
Series	General Series	M	Table 8-20
Equipment	General Equipment	M	Table 8-21
	SC Equipment	M	Table 8-22
Image	General Image	M	Table 8-23
	Image Pixel	M	Table 8-24
	SOP Common	M	Table 8-25

Table 8-17: SC Image Storage SOP Class - Patient Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Patient's Name	0010, 0010	Translated from the information available in Archium Record
Patient ID	0010, 0020	Translated from the information available in Archium Record
Patient's Birth Date	0010, 0030	Translated from the information available in Archium Record
Patient's Sex	0010, 0040	Translated from the information available in Archium Record

Table 8-18: SC Image Storage SOP Class - General Study Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Study Instance UID	0020, 000D	Creates a time-invariant UID instance.

Table 8-18: SC Image Storage SOP Class - General Study Module (Continued)

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Study Date	0008, 0020	Translated from the information available in Archium Record
Study Time	0008, 0030	Translated from the information available in Archium Record
Referring Physician's Name	0008, 0090	Translated from the information available in Archium Record
Study ID	0020, 0010	Translated from the information available in Archium Record
Accession Number	0008, 0050	Zero length.
Study Description	0008, 1030	Translated from the information available in Archium Record

Table 8-19: SC Image Storage SOP Class - Patient Study Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Patient's Size	0010, 1020	Translated from the information available in Archium Record
Patient's Weight	0010, 1030	Translated from the information available in Archium Record

Table 8-20: SC Image Storage SOP Class - General Series Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Modality	0008, 0060	"XA"
Series Instance UID	0020, 000E	Derived from the study UID.
Series Number	0020, 0011	Translated from the information available in Archium Record
Performing Physicians(s) Name	0008, 1050	Translated from the information available in Archium Record

Table 8-21: SC Image Storage SOP Class - General Equipment Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Manufacturer	0008, 0070	Translated from the information available in WSC Record

Table 8-22: SC Image Storage SOP Class -SC Equipment Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Conversion Type	0008, 0064	“WSD”

Table 8-23: SC Image Storage SOP Class - General Image Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Image Number	0020, 0013	Translated from the information available in Archium Record
Image Date	0008, 0023	Translated from the information available in Archium Record
Image Time	0008, 0033	Translated from the information available in Archium Record
Image Type	0008, 0008	“SECONDARY”
Image Comments	0020, 4000	Translated from the information available in Archium Record

Table 8-24: SC Image Storage SOP Class - Image Pixel Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Photometric Interpretation	0028, 0004	“MONOCHROME2”
Rows	0028, 0010	Translated from the information available in Archium Record
Columns	0028, 0011	Translated from the information available in Archium Record

Table 8-24: SC Image Storage SOP Class - Image Pixel Module (Continued)

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
Aspect Ratio	0028, 0034	Translated from the information available in Archium Record
Pixel Data	7FE0, 0010	Translated from the information available in Archium Record

Table 8-25: SC Image Storage SOP Class -SOP Common Module

<i>Attribute Name</i>	<i>Tag</i>	<i>Note</i>
SOP Class UID	0008, 0016	“1.2.840.10008.5.1.4.1.1.12.1”
SOP Instance UID	0008, 0018	Derived from the study instance UID using either the creation sequence or image number attribute.
Specific Character Set	0008, 0005	“ISO_IR 100”
Instance Creator UID	0008, 0014	“1.2.840.113697.6.3.” + Unit serial number string