DICOM Conformance Statement

DigitalDiagnost C50 1.1

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1. DICOM Conformance Statement Overview

This document is the DICOM Conformance Statement for the Philips Medical Systems DigitalDiagnost C50 system. Supported Networking DICOM Services can be found below in Table 1.

The figure below shows the position of the DigitalDiagnost C50 1.1 in a radiology environment.

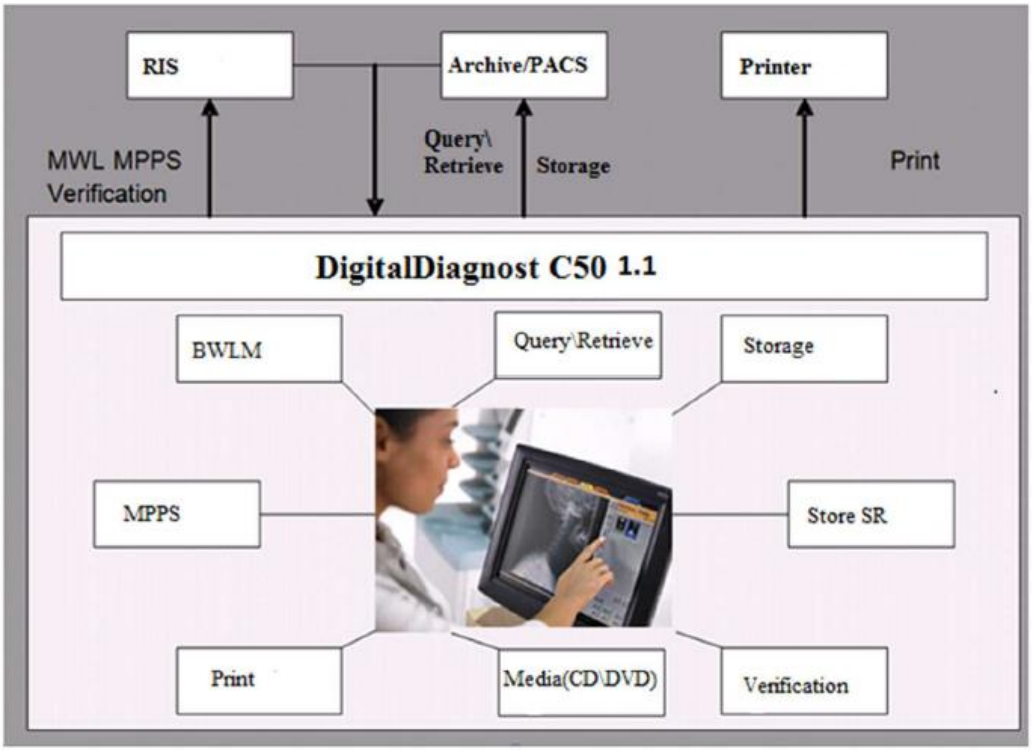

Figure 1: DigitalDiagnost C50 1.1 in a DICOM network

DigitalDiagnost C50 1.1 is an embedded modality system for acquiring DICOM images. It provides, among other things, the following features:

- Verification of application level communication.
- Basic Worklist Management (BWLM).
- Storage of images on a remote DICOM node.
- Study Management per Modality Performed Procedure Step (MPPS).
- Printing of hardcopies on a remote DICOM Printer.
- Storage of images per DICOM Media on CD/DVD.
- Storage of Dose SR instances on a remote DICOM node.
- Query and Retrieve of instances from an external DICOM node (Q/R).

The system is verified as DIN 6862-2 compliant.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	UID			
Other				
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes	N/A

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	UID			
Print Management				
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No	N/A
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No	N/A
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No	N/A
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No	N/A
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No	N/A
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No	N/A
Query/Retrieve				
Patient Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	No	No
Patient Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	No	No
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	No	No
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	No	No
Transfer				
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	No	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	No	Yes
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No	Yes
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No	No
Workflow Management				
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No	N/A
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No	N/A
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No	N/A

The services can be specified as a SCU, SCP or as an Option, which means that it is either configurable or that it can be purchased separately. All the supported Media Services by DigitalDiagnost C50 are shown in the next table.

Table 2: Media Services

Media Storage Application Profile	File-set Creator (FSC)	File-set Updater (FSU)	File-set Reader (FSR)
Compact Disk-Recordable			
General Purpose CD-R Interchange	Yes	No	Yes
General Purpose Secure CD-R Interchange	Yes	No	No
DVD			
General Purpose DVD Interchange	Yes	No	Yes

2. Contents

3. Introduction

3.1. Revision History

The revision history provides dates and differences of the different releases.

Table 3: Revision History

Document Version	Date of Issue	Description of change
01	24-Oct-2019	First Release for DigitalDiagnost C50 1.1
02	17-Feb-2025	Second Release for DigitalDiagnost C50 1.1 Added DIN claim to the product and Updated section 8.1 with new attributes, values and modules.

3.2. 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.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.
This DICOM 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 an IT 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 analyze 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 ensure 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 relevent 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).
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)

3.4. Definitions, Terms and Abbreviations

Table 4: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
AE	Application Entity
AP	Application Profile
BWLM	Basic Worklist Management
CD	Compact Disc
CD-R	CD-Recordable
CR	Computed Radiography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
DIN	Deutsches Institut für Normung E.V.
DVD	Digital Versatile Disc
DX	Digital X-Ray
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
MPPS	Modality Performed Procedure Step
NEMA	National Electrical Manufacturers Association
OT	Other
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

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Parts 1 - 22 (NEMA PS 3.1- PS 3.22),
National Electrical Manufacturers Association
1300 North 17th Street
Suite 900
Arlington, Virginia 22209
Internet: https://www.dicomstandard.org/current

4. Networking

This section contains the networking related services (vs. the media related ones).

4.1. Implementation model

The implementation model consists of three sections:

- The application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities,
- A functional description of each Application Entity, and
- The sequencing constraints among them.

4.1.1. Application Data Flow

The DigitalDiagnost C50 system consists of one single application entity, the Eleva AE.The figure below shows the networking application data flow as a functional overview of the Eleva AE.

It incorporates the following functionality:

- The ELEVA AE can verify application level communication by using the verification service as SCu and SCP.
- The ELEVA AE can request a worklist by using the Basic Worklist Management service as SCU.
- The ELEVA AE can store images by using the Storage service as SCU and use the Storage-Commit SOP-Class perform storage-commit as SCU.
- The ELEVA AE can compose the modality performed procedure step by using the Study Management service as SCU.
- The ELEVA AE can print images by using the Print Management service as SCU.
- The ELEVA AE can Query and retrieve images from a remote DICOM node.

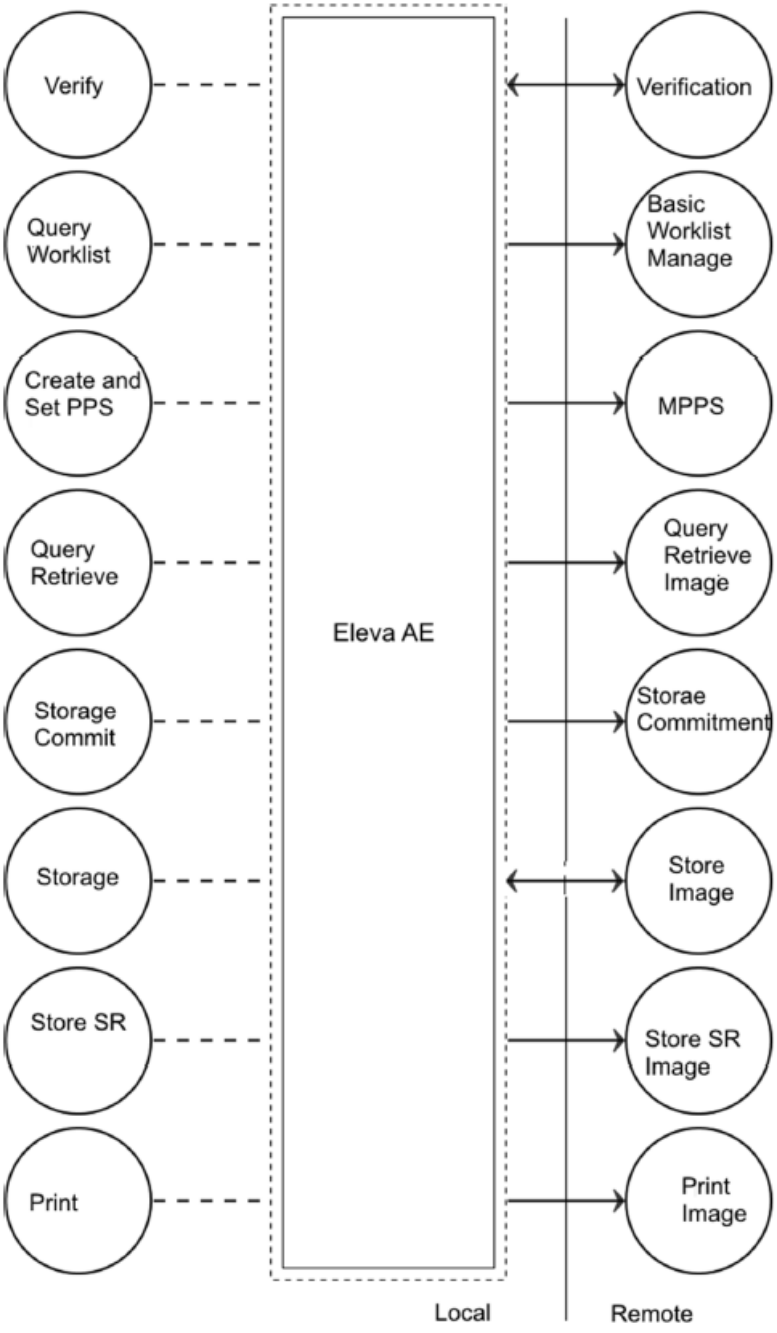

Figure 2: Application Data Flow Diagram

4.1.2. Functional Definition of AE's

This section describes in general terms the functions to be performed by the AE, and the DICOM services used to accomplish these functions.

4.1.2.1. Functional Definition of ELEVA AE

The Eleva AE is the one and only application entity within the DigitalDiagnost C50 1.1. It includes the following service classes.

Verification Service Class
The Eleva AE provides the Verification service as SCP. A remote SCU can request an association with the Eleva AE for Verification SOP class. After accepting the association the Eleva AE can receive and respond to the Verification request and release the association when requested.

Basic Worklist Management Service Class
The Eleva AE can use the Basic Worklist Management service as SCU.
After initiating the worklist query the Eleva AE can request an association with the configured remote Basic Worklist Management SCP. After accepting the association the Eleva AE can send the find request, wait for response, and then release the association. The user interface can be updated with the query results.

Storage Service Class
The Eleva AE can use the Storage service as SCU. After a performed procedure step the Eleva AE can store the related images at the configured Storage SCP. It can request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the Eleva AE can send the store request, wait for response, and then release the association. After successful storage the user interface can be updated accordingly. After successful storage, if selected, the Eleva AE can request storage commitment per Storage Commitment service (ref. Storage Commitment Service Class).

Storage Commitment Service Class
The Eleva AE can perform the Storage Commitment service as SCU.The Eleva AE can request an association with the selected remote SCP for the Storage Commitment Push Model SOP class. When the association is accepted, theEleva AE can send the Storage Commitment requests, receive the Storage Commitment responses and act accordingly, and release the association. When the remote commitment actions have been finished, the remote SCP shouldrequest an association with the Eleva AE (still SCU). After accepting the association, the Eleva AE can receive the Storage Commitment reports, and release the association when requested. The Storage Commitment Service can be done synchronously and asynchronously.A detailed specification of the Storage Commitment is described in section 4.2.1.3.6 (Real-World Activity: Storage Commitment Push Model as SCU).

Query Retrieve Service Class
The Eleva AE provides the Query/Retrieve service as SCU (Query/Retrieve Image) to query and retrieve images\instances from remote DICOM nodes.

Modality Performed Procedure Step Service Class
The Eleva AE can use the Study Management service as SCU. Before performing a procedure step the Eleva AE can request an association with the configured remote Study Management SCP. After accepting the association the Eleva AE can send a create request, wait for response, and then release the association. After performing a procedure step the Eleva AE can request a new association to send a set request, and after response, release the association.Depending on the status of creates and set and the configuration the Eleva AE can perform a retry. The user interface can be updated with the performed procedure step status.

Basic Grayscale Print Management Meta Class
The Eleva AE can use the Basic Grayscale Print Management service as SCU. After a performed procedure step the Eleva AE can print the related images on the configured Printer. It can request an association with the remote Basic Grayscale Print Management SCP for the applicable Basic Grayscale Print Management SOP class. After accepting the association the Eleva AE can send the print request, wait for response, and then release the association.After successful printing the user interface can be updated accordingly.

4.1.3. Sequencing of Real World Activities

The figure below shows a typical sequence of an examination using a worklist. The user updates the worklist (query Worklist) and then selects and opens an examination. When the user starts the examination (acquiring the first image), the RIS is notified (Create Performed Procedure Step). After the user confirmed each acquisition (image 1-N) per default the image is sent to archive (Store Image) and printer (Print Image) simultaneously. Finally, when closing the examination, the RIS is notified to update thedata of the examination (Set Performed Procedure Step).

Note that Print Image will send images to the printer only when enough images were received to fulfill the configured printerformat or when the print job is flushed manually. When the last image of an examination is received the print job will be flushed automatically.

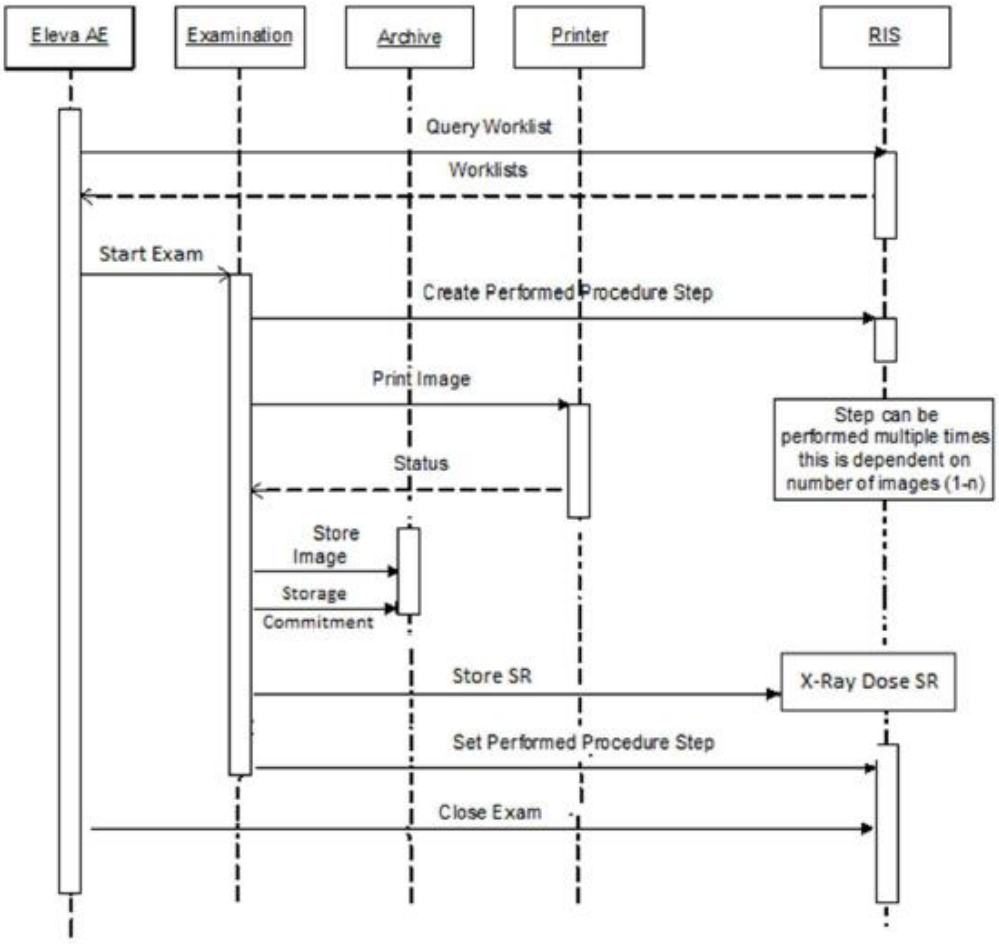

Figure 3: Sequence of an examination

4.1.3.1. Sequencing of Query/Retrieve Activity

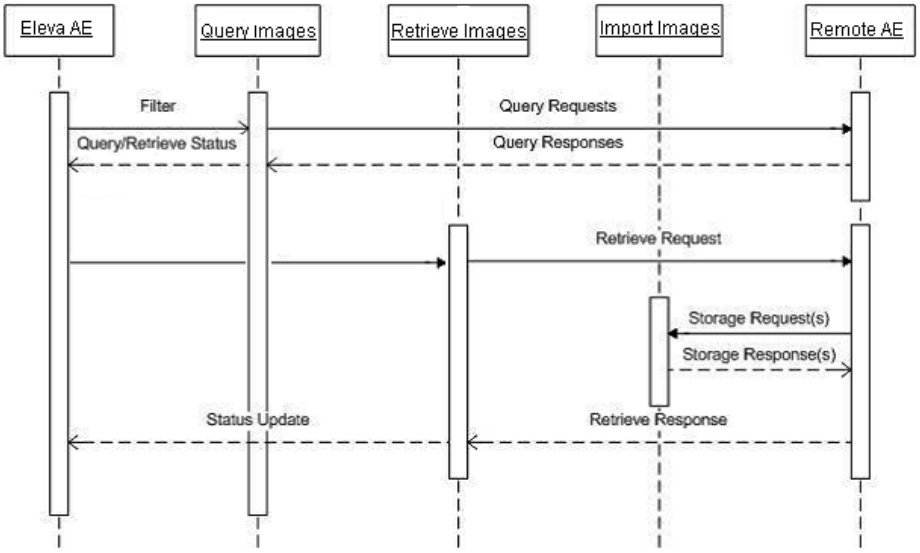

Figure 4: Sequence of Query\Retrieve

4.2. AE Specifications

This section in the DICOM Conformance Statement is a set of Application Entity specifications.There is only one AE is in the implementation.

4.2.1. Eleva AE

Detail of this specific Application Entity is specified in this section.

4.2.1.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 5: SOP Classes for Eleva AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No
Patient Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Patient Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	No
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.1.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.2.1.2.1 General

The DICOM standard application context is specified below.

Table 6: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

The number of simultaneous associations that an Application Entity can support as an Initiator or Acceptor is specified here.

Table 7: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	3

Table 8: Number of associations as an Association Acceptor for this AE

Description	Value
Maximum number of simultaneous associations	20

4.2.1.2.3 Asynchronous Nature

The implementation supports negotiation of multiple outstanding transactions, along with the maximum number of outstanding transactions supported.

Table 9: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	No enforced limit

4.2.1.2.4 Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

Table 10: DICOM Implementation Class and Version for Eleva AE

Implementation Class UID	1.3.46.670589.30.42.0
Implementation Version Name	PMS_ELEVA_42.0

4.2.1.2.5 Communication Failure Handling

The behavior of the AE during communication failure is summarized in the next table.

Table 11: Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3. Association Initiation Policy

The behavior of this Application Entity is summarized in the next Table.

Table 12: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT _permanent, 1: REJECT_SOURCE_dul_user, 1: REJECT_REASON_no_reason_given)
		2 - application-context-name-not supported	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT _permanent, 1: REJECT_SOURCE_dul_user, 2: REJECT_REASON _application_context_not_support)
		3 - calling-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT _permanent, 1: REJECT_SOURCE_dul_user, 3: REJECT_REASON _calling_aetitle_not_recognized)
		7 - called-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT _permanent, 1: REJECT_SOURCE_dul_user, 7: REJECT_REASON _called_aetitle_not_recognized)
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	Association is not established. The following error is logged. Error: UserRecoverable: impl.dicom.access.PEER: Associationrejected by peer (1: REJECT_RESULT _permanent, 2: REJECT_SOURCE _dul_provider (acse), 1: REJECT_REASON _no_reason_given)

Result	Source	Reason/Diagnosis	Behavior
		2 - protocol-version-not-supported	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT _permanent, 2: REJECT_SOURCE _dul_provider (acse), 2: REJECT_REASON _application_context_not_support)
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT _permanent, 3: REJECT_SOURCE _dul_provider (presentation), 1: REJECT_REASON _no_reason_given)
		2 - local-limit-exceeded	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT _permanent, 3: REJECT_SOURCE _dul_provider (presentation), 2: REJECT_REASON _application_context_not_support)
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 1: REJECT_REASON_no_reason_given)
		2 - application-context-name-not supported	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 2: REJECT_REASON _application_context_not_support)
		3 - calling-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 3: REJECT_REASON _calling_aetitle_not_recognized)
		7 - called-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 7: REJECT_REASON _called_aetitle_not_recognized)

Result	Source	Reason/Diagnosis	Behavior
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 2: REJECT_SOURCE_dul_provider (acse), 1: REJECT_REASON _no_reason_given)
		2 - protocol-version-not-supported	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 2: REJECT_SOURCE_dul_provider (acse), 2: REJECT_REASON _application_context_not_support)
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 3: REJECT_SOURCE_dul_provider (presentation), 1: REJECT_REASON _no_reason_given)
		2 - local-limit-exceeded	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 3: REJECT_SOURCE_dul_provider (presentation), 2: REJECT_REASON _application_context_not_support)

The behavior of the AE on receiving an Association abort is summarized in the next table.

Table 13: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	When received, the Eleva Workspot terminates the connection with the following log: Association ABORTED by peer (0: ABORT_SOURCE_dul_user, 0: ABORT_REASON_not_specified).
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	When received, the Eleva Workspot terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 0: ABORT_REASON_not_specified).
	1 - unrecognized-PDU	When received, the Eleva Workspot terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 1: ABORT_REASON_unrecognized_pdu).
	2 - unexpected-PDU	When received, the Eleva Workspot terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 2: ABORT_REASON_unexpected_pdu).

Source	Reason/Diagnosis	Behavior
	4 - unrecognized-PDU-parameter	When received, the Eleva Workspot terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 4: ABORT_REASON _unrecognized_pdu_parameter).
	5 - unexpected-PDU-parameter	When received, the Eleva Workspot terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 5: ABORT_REASON _unexpected_pdu_parameter).
	6 - invalid-PDU-parameter-value	When received, the Eleva Workspot terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 6: ABORT_REASON _invalid_pdu_parameter).

The behavior of the AE during DICOM communication failure is summarized in next table

Table 14: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3.1 (Real-World) Activity – Verification as SCU

4.2.1.3.1.1 Description and Sequencing of Activities

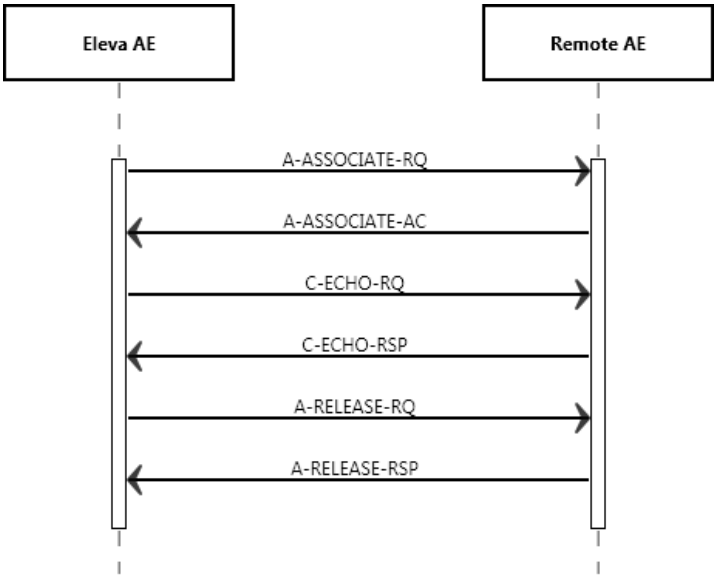

Figure 5: (Real World) Activity - Verification as SCU

The ELEVA AE can initiate associations to remote systems to verify application level communication using the C-ECHO command. This can be done using the DICOM Verification Tab for Server Test in the QA menu.

4.2.1.3.1.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 15: Proposed Presentation Contexts for (Real-World) Activity – Verification as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc. Behavior of an Application Entity SOP class is summarized as shown in next Table. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

4.2.1.3.1.3.1 Dataset Specific Conformance for Verification C-ECHO SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 16: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Verification is complete	The DigitalDiagnost C50 has successfully received the verification request response.

Table 17: Communication Failure Behavior

Exeption	Behavior
Timeout	The Association is aborted using A-ABORT and the command is marked as failed. The reason is logged. After a maximum number of retries the user is notified via pop-up (in preview mode only).
Association aborted	The command is marked as failed. The reason is logged. After a maximum number of retries the user is notified via pop-up (in preview mode only).
Failed to connect	Log entry. After a maximum number of retries the user is notified via pop-up (in preview mode only).

4.2.1.3.2 (Real-World) Activity – Modality Worklist as SCU

4.2.1.3.2.1 Description and Sequencing of Activities

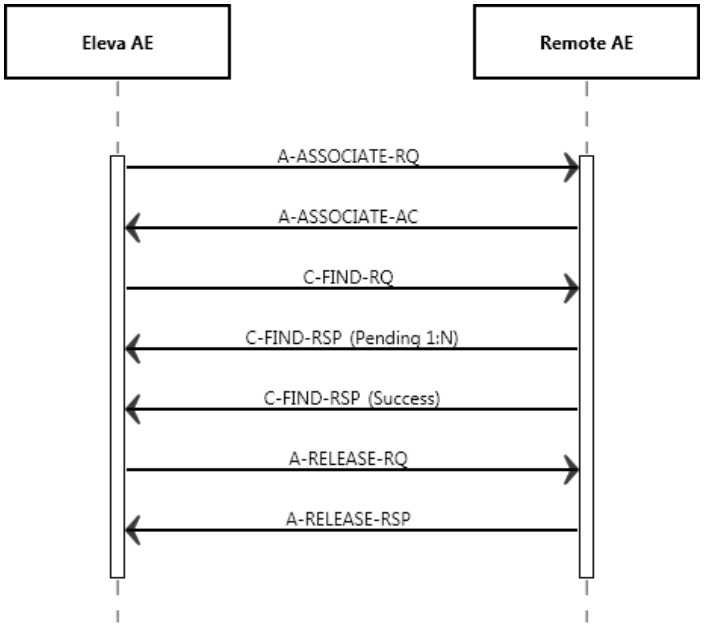

Figure 6: (Real World) Activity - Modality worklist As SCU

For each Broad or specific Worklist request, an association towards the Basic Worklist Management SCP is established and a C-FIND request is transmitted. The Broad query can be configured with a combination of the Matching Keys:

- Scheduled Station AE Title
- Scheduled Procedure Step Start Date
- Modality

Each of the matching keys is optional. The association will be closed on reception of the last C-FIND response. The Worklist Query result is displayed in the Patient List. The query is interruptible if it was triggered by the user.

After clicking the Query Worklist button the ELEVA AE requests an association with the configured remote Basic Worklist Management SCP. When the association is accepted the ELEVA AE sends the broad query find request, wait for response, and then release the association.

This RWA may be initiated in two ways:
After clicking the Query Worklist button the ELEVA AE requests an association with the configured remote Basic WorklistManagement SCP. When the association is accepted the ELEVA AE sends the Broad Query find request, wait for response, and then release the association.

After clicking the Patient Query button - entering and confirming the matching key values - the ELEVA AE requests an association with the configured remote Basic Worklist Management SCP. When the association is accepted the ELEVA AE sends the patient query find request, wait for response, and then release the association.

Optionally the Broad Query can also be performed automatically in the system background. The time interval between subsequent background queries is configurable. Manual and automatic background queries are serialized and do not interfere with another.

4.2.1.3.2.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 18: Proposed Presentation Contexts for (Real-World) Activity – Modality worklist As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.2.3 SOP Specific Conformance for Modality Worklist Information Model - FIND SOP Class

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc. Behavior of an Application Entity SOP class is summarized as shown in next Table. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

4.2.1.3.2.3.1 Dataset Specific Conformance for Modality Worklist Information Model - FIND SOP Class C-FIND-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

The table below should be read as follows:

Attribute Name: Attributes supported to build a Modality Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching Keys for (automatic) Worklist Update.
R: Return Keys. An “X” will indicate that Modality will supply this attribute as Return Key with zero length for Universal Matching.
Q: Interactive Query Key. An “X” will indicate that this attribute as matching key can be used.
D: Displayed Keys. An “X” indicates that this Worklist attribute is displayed to the user during a patient registration dialog.
IOD: An “X” indicates that the value of this Worklist attribute will be used in the created Instances of this Performed Procedure Step.
Type of matching: The following types of matching exists:
Single Value Matching
List of UID Matching
Wild Card Matching
Range Matching
Sequence Matching
Universal Matching

Table 19: Worklist Request Identifier

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Patient Identification Module									
Medical Record Locator	0010,1090	LO							
Other Patient IDs	0010, 1000	LO		X		X			

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Other Patient Names	0010, 1001	PN							
Patient ID	0010, 0020	LO	X	X	X	X		Single Value, Universal	
Patient's Birth Name	0010, 1005	PN							
Patient's Mother's Birth Name	0010, 1060	PN							
Patient's Name	0010, 0010	PN	X	X	X	X		Single Value, Universal, WildCard	
Issuer of Patient ID	0010, 0021	LO		X				Universal	
Patient Demographic Module									
Branch of Service	0010, 1081	LO							
Confidentiality Constraint on Patient Data Description	0040, 3001	LO							
Country of Residence	0010, 2150	LO							
Ethnic Group	0010, 2160	SH		X		X			
Military Rank	0010, 1080	LO							
Occupation	0010, 2180	SH		X		X			
Patient Comments	0010, 4000	LT		X		X			
Patient's Address	0010, 1040	LO							
Patient's Birth Date	0010, 0030	DA		X		X			
Patient's Birth Time	0010,0032	TM							
Patient's Religious Preference	0010, 21F0	LO							
Patient's Sex	0010, 0040	CS		X		X		Single	
Patient's Size	0010, 1020	DS		X		X			
Patient Telephone Numbers	0010, 2154	SH							
Patient's Weight	0010,1030	DS		X		X			
Region of Residence	0010, 2152	LO							
Patients Insurance Plan Code Sequence	0010, 0050	SQ							
Patient Medical Module									
Additional Patient History	0010, 21B0	LT		X		X			
Allergies	0010, 2110	LO		X		X			
Last Menstrual Date	0010, 21d0	DA							
Medical Alerts	0010, 2000	LO		X		X			
Patient State	0038, 0500	LO		X		X			
Pregnancy Status	0010, 21C0	US		X		X			
Smoking Status	0010, 21A0	CS							
Special Needs	0038, 0050	LO		X					
Visit Identification Module									
Admission ID	0038,0010	LO							
Institution Address	0008, 0081	ST							
Institution Name	0008, 0080	LO							

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Visit Status Module									
Current Patient Location	0038, 0300	LO		X					
Patient's Institution Residence	0038, 0400	LO							
Visit Comments	0038, 4000	LT							
Visit Status ID	0038, 0008	CS							
Visit Relationship Module									
Referenced Patient Sequence	0008, 1120	SQ							
>Referenced SOP Class UID	0008, 1150	UI							
>Referenced SOP Instance UID	0008, 1155	UI							
Visit Admission Module									
Admitting Date	0038, 0020	DA							
Admitting Time	0038, 0021	TM							
Referring Physician Address	0008,0092	ST							
Referring Physician's Name	0008,0090	PN				X			
Referring Physician Telephone Numbers	0008,0094	SH							
Route Of Admissions	0038, 0016	LO							
Admitting Diagnoses Code Sequence	0008,1084	SQ							
Scheduled Procedure Step Module									
Scheduled Procedure Step Sequence	0040, 0100	SQ		X					
>Modality	0008, 0060	CS	X	X	X			Single Value, Universal	CR, DX, OT, US, MG, RF, XA, PX, NM
>Pre-Medication	0040, 0012	LO		X					
>Requested Contrast Agent	0032, 1070	LO		X					
>Scheduled Performing Physician's Name	0040, 0006	PN		X					
>Scheduled Procedure Step Description	0040, 0007	LO		X		X			
>Scheduled Procedure Step ID	0040, 0009	SH		X					
>Scheduled Procedure Step Location	0040, 0011	SH		X		X			

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
>Scheduled Procedure Step Start Date	0040, 0002	DA	X	X	X			Single Value, Universal	Value: All, Today, Tomorrow, Yesterday
>Scheduled Procedure Step Start Time	0040, 0003	TM		X		X			
>Scheduled Procedure Step Status	0040, 0020	CS		X		X			
>Scheduled Station AE Title	0040, 0001	AE	X	X	X			Single Value, Universal	
>Scheduled Station Name	0040, 0010	SH		X					
>Scheduled Protocol Code Sequence	0040, 0008	SQ		X					
>>Code Meaning	0008, 0104	LO							
>>Code Value	0008, 0100	SH							
>>Coding Scheme Designator	0008, 0102	SH							
>>Coding Scheme Version	0008, 0103	SH							
Requested Procedure Module									
Requested Procedure Description	0032, 1060	LO		X		X			
Requested Procedure ID	0040, 1001	SH	X	X	X			Single Value, Universal	
Study Date	0008, 0020	DA							
Study Instance UID	0020, 000D	UI		X					
Referenced Study Sequence	0008,1110	SQ		X					
>Referenced SOP Class UID	0008,1150	UI		X					
>Referenced SOP Instance UID	0008,1155	UI		X					
Requested Procedure Code Sequence	0032, 1064	SQ		X					
>Code Meaning	0008, 0104	LO		X					
>Code Value	0008, 0100	SH		X					
>Coding Scheme Designator	0008, 0102	SH		X					
>Coding Scheme Version	0008, 0103	SH		X					
Requested Procedure Priority	0040, 1003	SH							
Imaging Service Request Module									
Accession Number	0008, 0050	SH	X	X	X	X		Single Value, Universal	

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Imaging Service Request Comments	0040, 2400	LT							
Issue Date of Imaging Service Request	0040, 2004	DA							
Reason for the Imaging Service Request (RETIRED)	0040, 2001	LO		X					
Requesting Physician	0032, 1032	PN		X					
Requesting Service	0032, 1033	LO							
Module: Additional Attributes Module (O)									
Institution Code Sequence	0 0 08,0082	SQ		X				Universal	
Admitting Diagnoses Description	0008,1080	LO		X				Universal	
Referenced Visit Sequence	0 0 08,1125	SQ		X				Universal	
Patient's Age	0010,1010	AS							
Referenced Patient Alias Sequence	0038,0004	SQ							
Issuer Of Admission ID (retired)	0 0 38,0011	LO							
Reason for The Requested Procedure	0040,1002	LO							
Requested Procedure Location	0040,1005	LO							
Placer Order Number/Procedure (retired)	0040,1006	SH							
Filler Order Number/Procedure (retired)	0040,1007	SH							
Confidentiality Code	0040,1008	LO							
Reporting Priority	0040,1009	SH							
Issue Time Of Imaging Service Request	0040,2005	TM							
Order Entered By	0040,2008	PN							
Order Enterer Location	0040,2009	SH							
Order Callback Phone Number	0040,2010	SH							
Placer Order Number / Imaging Service Request	0040,2016	LO							
Filler Order Number / Imaging Service Request	0040,2017	LO							

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Names Of Intended Recipients Of Results	0040,1010	PN							
Requested Procedure Comments	0040,1400	LT							

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 20: C-FIND-RQ Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The Worklist is updated.
Failure	A700	Refused – Out of resources	The association is released. The reason is logged. The user is displayed the message “no RIS connection available. Please confirm.”
	A900	Failed – Identifier does not match SOP class	The association is released. The reason is logged. The user is displayed the message “no RIS connection available. Please confirm.”
	Cxxx	Failed – Unable to process	The association is released. The reason is logged. The user is displayed the message “no RIS connection available. Please confirm.”
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	The Query Worklist job continues.
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The Query Worklist job continues.

Table 21: DICOM Command Communication Failure Behavior

Exception	Behavior
RIS query timeout (default 240 seconds)	The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user. The user is displayed the message “no RIS connection available. Please confirm.”
Association aborted	The command is marked as failed. The reason is logged and reported to the user. The user is displayed the message “no RIS connection available. Please confirm.”

4.2.1.3.3 (Real-World) Activity – Modality Performed Procedure Step as SCU

4.2.1.3.3.1 Description and Sequencing of Activities

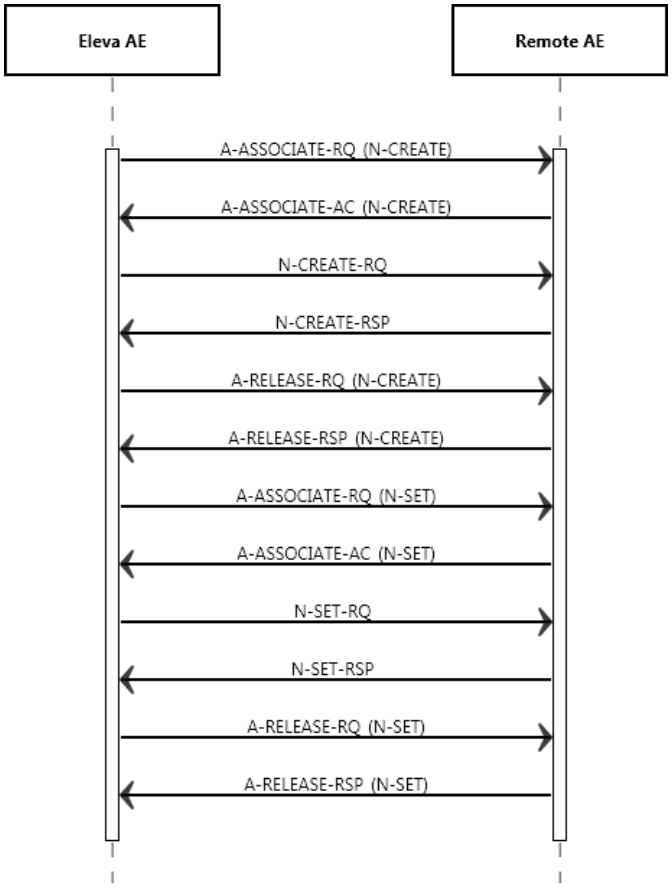

Figure 7: (Real World) Activity - Modality Performed Procedure Step as SCU

A DigitalDiagnost C50 “Examination” is regarded equivalent to a DICOM Procedure Step. It is scheduled or manually entered before an acquisition is taken, and performed by taking acquisitions. If scheduled by the RIS, one Examination is the result of one Scheduled Procedure Step. Since an examination cannot be re-opened after having been closed, and each examination workflow context is enclosed in one MPPS, one examination can result in 0:1 MPPS instances. However, image archiving after the examination’s closure leads to 1: n MPPS instances per examination (append case).

After the image for a Scheduled Procedure Step has been acquired, the system sets the MPPS status of the related examination to “IN PROGRESS” and generates an initial MPPS IN PROGRESS message. The system does not generate intermediate MPPS IN PROGRESS messages for subsequent acquisitions of this Scheduled Procedure Step instance.

After finishing the appropriate acquisition(s), the system will change the MPPS status of the related examination to “COMPLETED” and generate an MPPS N-SET-FINAL message.

DigitalDiagnost C50 also generates MPPS messages for unscheduled examinations.

The MPPS COMPLETED message will list the UID’s of all related DICOM archived images and the format of (optionally) generated direct prints.

After abandoning or discontinuing a procedure step, the operator can set the MPPS status of the related examination to “DISCONTINUED” and the system generates a MPPS DICONTINUED message. The reason for abandoning or discontinuing a procedure step is unspecified.

The operator can interchange the performed sequence order of scheduled procedure steps.

MPPS messages can interleave. Depending on the application workflow optimization by the user, an MPPS sequence like this can come up:
MPPS / SOP Instance UID 1: N-CREATE (IN PROGRESS)
MPPS / SOP Instance UID 2: N-CREATE (IN PROGRESS)
MPPS / SOP Instance UID 3: N-CREATE (IN PROGRESS)
...
MPPS / SOP Instance UID 2: N-SET (COMPLETED)
MPPS / SOP Instance UID 1: N-SET (COMPLETED)
MPPS / SOP Instance UID 3: N-SET (COMPLETED)

(i.e.: running multiple procedure steps 'in parallel').

Sequencing of Activities
After storing a performed procedure step the ELEVA AE can request an association with the configured remote Study Management SCP. After accepting the association the ELEVA AE can send a Create request, wait for response, and then release the association.

4.2.1.3.3.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 22: Proposed Presentation Contexts for (Real-World) Activity – Modality Performed Procedure Step As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.3.3 SOP Specific Conformance for Modality Performed Procedure Step SOP Class

When acquiring the first image of a Scheduled or Unscheduled Procedure Step, DigitalDiagnost C50 generates a MPPS IN PROGRESS message.

DigitalDiagnost C50 does not generate intermediate IN PROGRESS (N-SET) messages and does not support the Performed Procedure Step Exception Management Option. DigitalDiagnost C50 has no Billing Code Tables and does not support the Performed Procedure Step Billing and Material Management Option, except default values for Medium Type (2000,0030) and Film Size ID (2010,0050), if optional Local Print is configured.

Assisted Acquisition Protocol Setting Option
ELEVA AE by default derives the specific acquisition protocol from the Scheduled Protocol Code Sequence Items. Any single Item results in an Examination.
ELEVA AE supports 3 more (configurable) mapping relations, as shown below:

- Examination is selected from Scheduled Protocol Code Items->Code Value (0040, 0008) (default)
- Examination is selected from Scheduled Procedure Step Description (0040, 0007)
- Examination is selected from Requested Procedure Code Items->Code Value (0032, 1064)
- Examination is selected from Requested Procedure Description (0032, 1060)

ELEVA AE does not evaluate the attributes Coding Scheme Version (0008, 0103), Coding Scheme Designator (0008, 0102), Code Meaning (0008, 0104), but only the Code Value (0008, 0100), for mapping the examination settings. I.e. ELEVA AE expects that any used Code Value is unique (unambiguous) within a given RIS domain.

Restrictions Depending on Number of Scheduled Protocol Code Items

It is highly recommended that the Scheduled Procedure Step contains only 1 Item in the Scheduled Protocol Code Sequence.

If the Scheduled Procedure Step contains <n> items in the Scheduled Protocol Code Sequence, the Scheduled Procedure Step is split into <n> examinations, where any single examination shows only 1 of the Scheduled Protocol Code Items, but all the other attributes are the same.

When such an examination is returned back via MPPS, also the Performed Protocol Code Sequence will show only 1 item. If all <n> Scheduled Procedure Step Code Items are performed, <n> MPPS instances will be sent back to the RIS, and the sum of all Performed Protocol Code Items will be <n>.

4.2.1.3.3.1 Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-CREATE-SCU

Table 23: MPPS Request Identifiers for N-CREATE-RQ

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Relationship Module				
Patient ID	0010,0020	LO		
Patient's Birth Date	0010,0030	DA		
Patient's Name	0010,0010	PN		
Patient's Sex	0010,0040	CS		
Scheduled Step Attributes Sequence	0040,0270	SQ		
>Accession Number	0008,0050	SH		
>Requested Procedure Description	0032,1060	LO		
>Requested Procedure ID	0040,1001	SH		
>Scheduled Procedure Step Description	0040,0007	LO		
>Scheduled Procedure Step ID	0040,0009	SH		
>Study Instance UID	0020,000D	UI		
>Referenced Study Sequence	0008,1110	SQ		
>Scheduled Protocol Code Sequence	0040,0008	SQ		
Issuer of Patient ID	0010,0021	LO		
Referenced Patient Sequence	0008,1120	SQ		
>Referenced SOP Class UID	0008,1150	UI		
>Referenced SOP Instance UID	0008,1155	UI		
Performed Procedure Step Information Module				
Performed Location	0040,0243	SH		EMPTY
Performed Procedure Step Description	0040,0254	LO		
Performed Procedure Step End Date	0040,0250	DA		End date of the examination
Performed Procedure Step End Time	0040,0251	TM		End time of the examination
Performed Procedure Step ID	0040,0253	SH		
Performed Procedure Step Start Date	0040,0244	DA		Start date of the examination

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Relationship Module				
Performed Procedure Step Start Time	0040,0245	TM		Start time of the examination
Performed Procedure Step Status	0040,0252	CS		
Performed Procedure Type Description	0040,0255	LO		
Performed Station AE Title	0040,0241	AE		
Performed Station Name	0040,0242	SH		EMPTY
Procedure Code Sequence	0008,1032	SQ		
Image Acquisition Results Module				
Modality	0008,0060	CS		
Study ID	0020,0010	SH		
Performed Protocol Code Sequence	0040,0260	SQ		
Performed Series Sequence	0040,0340	SQ		
Radiation Dose Module				
Entrance Dose	0040,0302	US		
Image and Fluoroscopy Area Dose Product	0018,115E	DS		Not sent in case of appended MPPS Instances
Total Number of Exposures	0040,0301	US		
Total Time of Fluoroscopy	0040,0300	US		
Exposure Dose Sequence	0040,030E	SQ		
Billing And Material Management Code Module				
Billing Procedure Step Sequence	0040,0320	SQ		
Film Consumption Sequence	0040,0321	SQ		

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 24: N-CREATE Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful operation	The SCP has successfully received the modality performed procedure step create request. Log entry.
Failure	0213	Resource limitation	The command is reported to the user as failed. The reason is logged. After a configured period of time the storage will be retried up to a configured number of times.
	XXXX	Any failure accept	The command is reported to the user as failed. The reason is logged. No retry.

Table 25: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using AP-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3.3.3.2 Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 26: MPPS Request Identifiers for N-SET-RQ

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Information Module				
Performed Procedure Step Description	0040,0254	LO		
Performed Procedure Step End Date	0040,0250	DA		
Performed Procedure Step End Time	0040,0251	TM		
Performed Procedure Step Status	0040,0252	CS		
Image Acquisition Results Module				
Performed Series Sequence	0040,0340	SQ		
>Operators' Name	0008,1070	PN		
>Performing Physician's Name	0008,1050	PN		
>Protocol Name	0018,1030	LO		Copied from Performed Protocol Code Sequence - Item code Value.
>Retrieve AE Title	0008,0054	AE		
>Series Description	0008,103E	LO		
>Series Instance UID	0020,000E	UI		
>Referenced Image Sequence	0008,1140	SQ		
>>Referenced SOP Class UID	0008,1150	UI		
>>Referenced SOP Instance UID	0008,1155	UI		
>Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ		
Radiation Dose Module				
Entrance Dose	0040,0302	US		
Image and Fluoroscopy Area Dose Product	0018,115E	DS		Not accumulating: re-processed images, non-digital images. Not sent in case of appended MPPS instances.
Total Number of Exposures	0040,0301	US		Not accumulating: re-processed images, non-digital images. Not sent in case of appended MPPS instances.
Total Time of Fluoroscopy	0040,0300	US		
Exposure Dose Sequence	0040,030E	SQ		
>Radiation Mode	0018,115A	CS		
Billing And Material Management Code Module				
Billing Procedure Step Sequence	0040,0320	SQ		
Film Consumption Sequence	0040,0321	SQ		

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 27: N-SET-RQ Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	The association is released
Failure	0110	Processing failure – performed procedure step object may no longer be updated	The reason is logged.
	XXXX	(any other failure)	The reason is logged.

Table 28: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using AP-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3.4 (Real-World) Activity – Image Export

4.2.1.3.4.1 Description and Sequencing of Activities

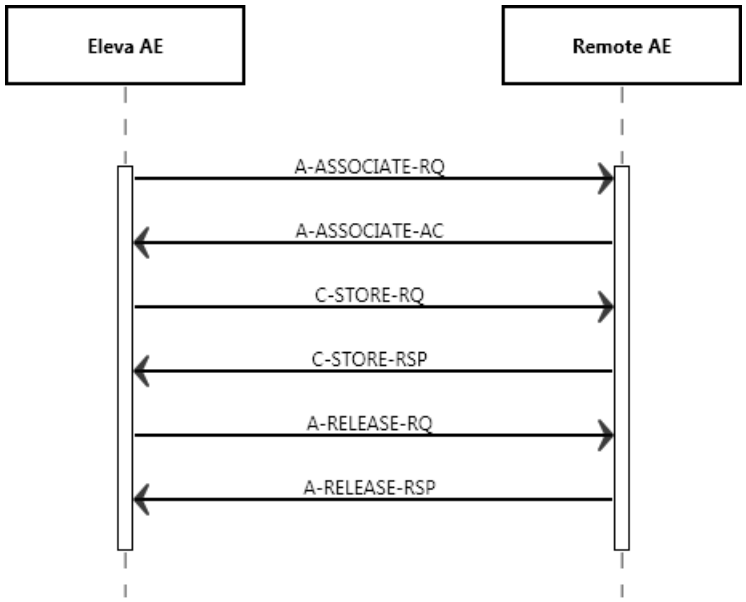

Figure 8: (Real World) Activity – Image Export

Export means that DigitalDiagnost C50 stores images without Storage Commitment.

This RWA may be initiated in two ways.

- Manually in the viewer, after clicking the Store button the ELEVA AE will store the selected images at the selected Storage SCP.
- Automatically during an examination, after clicking the Confirm button the ELEVA AE will automatically store the related images of the performed procedure step at the configured Storage SCP.

The ELEVA AE will request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the ELEVA AE will send the store request, wait for response, and then release the association. The store response status may be inspected on the UI.

Depending on the status of the store the ELEVA AE may queue store requests for retries. The queued store requests can be cancelled from the UI.

4.2.1.3.4.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 29: Proposed Presentation Contexts for (Real-World) Activity – Image Export

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
X-Ray Radiation Dose SR SOP Class	1.2.840.10008.5.1.4.1.1.88.67	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

By default, all images are DICOM Stored according to the SOP Class Digital XRay. CR Image attributes that are undefined for DX Images are stored in private attributes.

As a configurable choice, Images can be stored as Computed Radiology SOP Class. This capability is required to be compatible with installed radiology equipment. DX Image attributes that are undefined for CR Images are then stored in private attributes.Another choice can be DICOM Stored according to Secondary Capture SOP Class. This capability is required to be compatible with installed radiology equipment. Optionally only the attributes defined for Secondary Capture Images or all attributes are stored For DICOM CR images there is a constraint that a change in position, detector, body part orlaterality implies a new series. This has been relaxed for DX images through the use of the 'DX Anatomy Imaged' and 'DX Positioning' Modules, which define attributes at image level. The DX Image IOD is used in two SOP Classes as defined in the DICOM Standard, a SOP Class for storage of images intended for Presentation, and a SOP Class for storage of images intended for further Processing before presentation. These are distinguished by their SOP Class UID and by the Enumerated Value of the mandatory Attribute in the DX Series Module, Presentation Intent Type (0008,0068). It is possible to export / store one single image first as a DICOM CR and secondly as a DICOM DX object, therefore the SOP Instance UIDs of both DICOM image instances have to be different.

The Numbering Scheme shall support ‘Hanging Protocols’ of PACS systems & Viewing Stations, in case of the CR as well as the DX model:

1. The Series Number shall start with 1 for the first Series of every Study Instance, identified by StudyInstanceUID.
2. The Series Number shall increase by 1 for every new Series Instance within the same Study Instance, by the timely order, the Series Instances are created.
3. The Image Number shall start with 1 for every new Series Instance.
4. The Image Number shall increase by 1 for every new Image Instance within the same SeriesInstanceUID, by the timely order, the Images are exported.

For DX SOP Class is in the DICOM Standard defined:
The Digital X-Ray (DX) Image Information Object Definition specifies an image that has been created by a digital projection radiography imaging device.
Notes:

- This includes but is not limited to: chest radiography, linear and multi-directional tomography, orthopantomography and skeletal radiography. Acquisition of image data may include but is not limited to: CCD-based sensors, stimulable phosphor imaging plates, amorphous selenium, scintillation based amorphous silicon and secondary capture of film-based images.
- Specific IODs are defined for intra-oral radiography and mammography that further specialize the DX IOD.

A DX image shall consist of the result of a single X-Ray exposure, in order to ensure that the anatomical and orientation attributes are meaningful for the image, permitting safe annotation, appropriate image processing and appropriate dissemination.
Notes:

- The requirement for the DigitalDiagnost C50 specifically deprecates the common film/screen and Computed Radiography practice of making multiple exposures on different areas of a cassette or plate by using lead occlusion between exposures. Such acquisitions could be separated and transformed into multiple DX images during an appropriate quality assurance step by an operator.
- The requirement for the DigitalDiagnost C50 does not deprecate the acquisition of multiple paired structures during a single exposure, provided that they can be described by the relevent orientation Attributes. For example, an AP or PA projection of both hands side by side is typically obtained in a single exposure, and can be described by a Patient Orientation (0020,0020) of R\H or L\H since both hands are in the same traditional Anatomical Position.

4.2.1.3.4.3 SOP Specific Conformance for Storage SOP Class

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc. Behavior of an Application Entity SOP class is summarized as shown in next Table. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

4.2.1.3.4.3.1 Dataset Specific Conformance for C-STORE-RQ

Table 30: C-STORE-RQ Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Storage is complete	UI status is updated
Refused	A7xx	Out of resources	The association is released. The reason is logged.
Error	A9xx	Data set does not match SOP class	The association is released. The reason is logged.
	Cxxx	Cannot understand	The association is released. The reason is logged.
Warning	B000	Coercion of data elements	The association is released. The reason is logged.
	B006	Elements discarded	The association is released. The reason is logged.
	B007	Data set does not match SOP class	The association is released. The reason is logged.

Table 31: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3.5 (Real-World) Activity – Structured Dose Report Export

4.2.1.3.5.1 Description and Sequencing of Activities

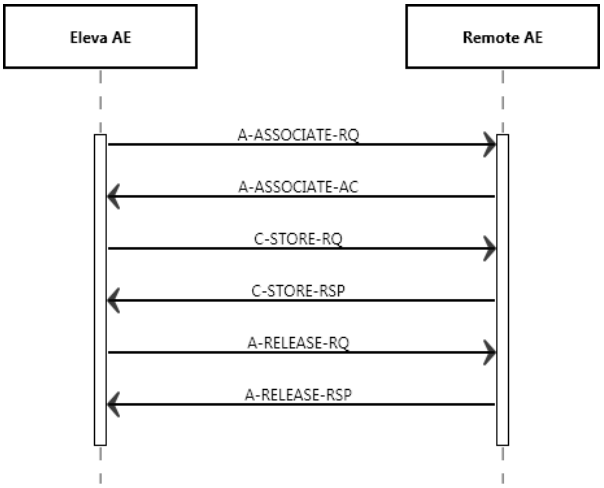

Figure 9: (Real World) Activity – Structured Dose Report Export

The ELEVA AE will request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association, the ELEVA AE will sends the store request, wait for response, and then release the association. The store response status can be inspected on the UI.

4.2.1.3.5.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 32: Proposed Presentation Contexts for (Real-World) Activity – Image Export

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
X-Ray Radiation Dose SR SOP Class	1.2.840.10008.5.1.4.1.1.88.67	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.5.3 SOP Specific Conformance for Storage SOP Class

Behavior of an Application Entity SOP class is summarized as shown in next Table. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

4.2.1.3.5.3.1 Dataset Specific Conformance for C-STORE-RQ

Detail regarding the Dataset Specific response behavior will be reported in this section.
This includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc

Table 33: C-STORE-RQ Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Storage is complete	UI status is updated
Refused	A700	Out of resources	The association is released. On receiving error in C-STORE RSP messages store operation is unsuccessful

Service Status	Error Code	Further Meaning	Behavior
Error	A900	Data set does not match SOP class	The association is released. On receiving error in C-STORE RSP messages store operation is unsuccessful.
	C000	Cannot understand	The association is released. On receiving error in C-STORE RSP messages store operation is unsuccessful.
Warning	B000	Coercion of data elements	The association is released. On receiving error in C-STORE RSP messages store operation is unsuccessful.
	B006	Elements discarded	The association is released. On receiving error in C-STORE RSP messages store operation is unsuccessful.
	B007	Data set does not match SOP class	The association is released. On receiving error in C-STORE RSP messages store operation is unsuccessful.

The status can be inspected via the user interface.

Table 34: DICOM Command Communication Failure Behavior

Service Status	Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reportde to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3.6 (Real-World) Activity – Storage Commitment Push Model AS SCU

4.2.1.3.6.1 Description and Sequencing of Activities

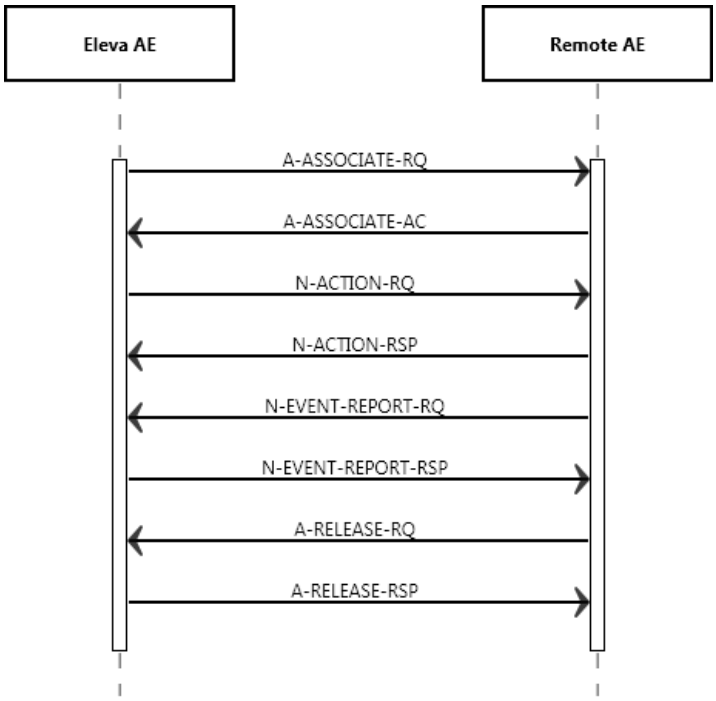

Figure 10: (Real World) Activity - Synchronous Storage Commitment Push Model as SCU within one association (Synchronous)

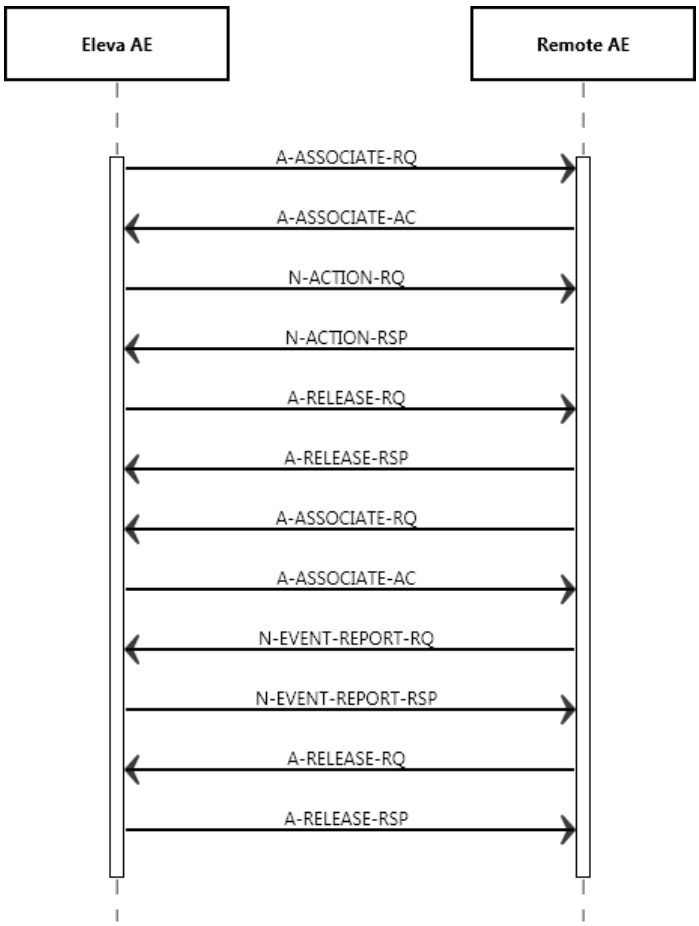

Figure 11: (Real World) Activity - Storage Commitment Push Model as SCU within separate associations (Asynchronous)

Archive means that DigitalDiagnost C50 stores images with Storage Commitment (both synchronous and asynchronous can be configured).

This RWA may be initiated in two ways.

- Manually in the viewer, after clicking the Store button the ELEVA AE will store the selected images at the selected Storage SCP.
- Automatically during an examination, after clicking the Confirm button the ELEVA AE will automatically store the related images of the performed procedure step at the configured Storage SCP.

The ELEVA AE will request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the ELEVA AE will send the store request, wait for response, and then release the association. The store response status can be inspected on the UI. The transferred image cannot be deleted from the system until the Storage Commit N-Event is received.

Depending on the status of the store the ELEVA AE may queue store requests for retries. The queued store requests can be cancelled from the UI.

When an archive supports DICOM Storage Commitment, this system can be configured for it. For each image that is sent to this node, also a Storage Commitment Request is sent. The image is delete-protected until the Storage Commit Response has been received. The current status is sho wn in the Image Info Panel.

4.2.1.3.6.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 35: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model AS SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.6.3 SOP Specific Conformance for Storage Commitment Push Model SOP Class

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc. Behavior of an Application Entity SOP class is summarized as shown in next Table. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

4.2.1.3.6.3.1 Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-ACTION-SCU

Table 36: Storage Commitment Attribute for N-ACTION-RQ

Attribute Name	Tag	Comment
Storage Commitment Module		
Transaction UID	0008, 1195	
Referenced SOP Sequence	0008, 1199	
>Referenced SOP Class UID	0008, 1150	
>Referenced SOP Instance UID	0008, 1155	

Table 37: N-ACTION-RQ Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Storage is complete	UI status is updated
Refused	A7xx	Out of resources	The association is released. The reason is logged. The user is informed.
Error	A9xx	Data set does not match SOP class	The association is released. The reason is logged. The user is informed.
	Cxxx	Cannot understand	The association is released. The reason is logged. The user is informed.
Warning	B000	Coercion of data elements	The association is released. The reason is logged. The user is informed.
	B006	Elements discarded	The association is released. The reason is logged. The user is informed.
	B007	Data set does not match SOP class	The association is released. The reason is logged. The user is informed.

Table 38: DICOM Command Communication Failure Behavior

Exception	Behavior
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3.6.3.2 Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-EVENT-REPORT-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc..

Table 39: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using AP-ABORT and command marked as failed. The reason is logged and reported tothe user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3.7 (Real-World) Activity – FIND as SCU

4.2.1.3.7.1 Description and Sequencing of Activities

When querying a remote database the ELEVA AE initiates an association to the selected peer entity, sends a C-FIND request and receives the related C-FIND responses.

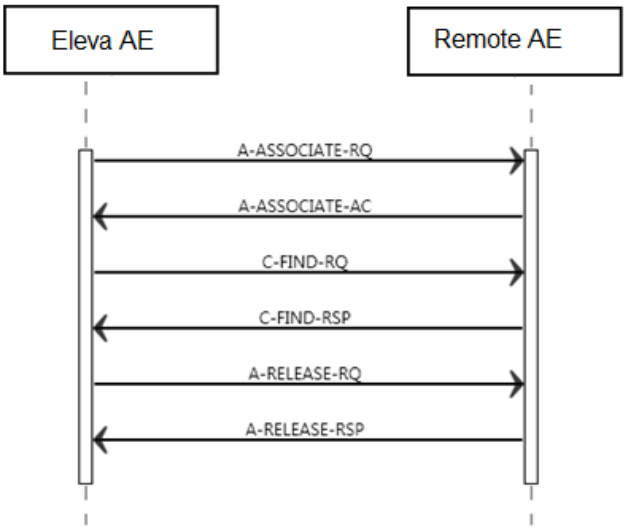

Figure 12: (Real World) Activity - FIND as SCU

4.2.1.3.7.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 40: Proposed Presentation Contexts for (Real-World) Activity – FIND as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.7.3 SOP Specific Conformance for FIND SOP Class

4.2.1.3.7.3.1 SOP Specific Conformance for Patient Root QR Information Model – FIND SOP Class

4.2.1.3.7.3.1.1 Dataset Specific Conformance for Patient Root QR Information Model – FIND SOP Class C-FIND-SCU

Table 41: C-FIND-RQ Dataset Specification (Patient Root)

Patient Root QR Information Model - FIND SOP Class				
Attribute Name	Tag	VR	Type of Matching	Comment
Query/Retrieve Level	0008, 0052	CS	Single Value	Patient, Study, Series
Patient Level Attributes For The Patient Root Query/Retrieve Information Model				
Patient's Name	0010, 0010	PN	Single Value, Universal, WildCard	
Patient ID	0010, 0020	LO	Single Value, Universal, WildCard	
Patient's Birth Date	0010, 0030	DA	Single Value, Universal	
Other Patient IDs	0010, 1000	LO	Single Value, Universal, WildCard	
Study Level Keys For The Patient Root Query/Retrieve Information Model				
Study Date	0008, 0020	DA	Universal, Range	
Study Time	0008, 0030	TM	Universal	
Accession Number	0008, 0050	SH	Universal	
Study Instance UID	0020, 000D	UI	Universal	
Study ID	0020, 0010	SH	Universal	
Series Level Attributes For The Patient Root Query/Retrieve Information Model				
Modality	0008, 0060	CS	Universal	
Series Instance UID	0020, 000E	UI	Universal	
Series Number	0020, 0011	IS	Universal	
Body Part Examined	0018, 0015	CS	Universal	

4.2.1.3.7.3.2 SOP Specific Conformance for Study Root QR Information Model – FIND SOP Class

4.2.1.3.7.3.2.1 Dataset Specific Conformance for Study Root QR Information Model – FIND SOP Class C-FIND-SCU

Table 42: C-FIND-RQ Dataset Specification (Study Root)

Study Root QR Information Model - FIND SOP Class				
Attribute Name	**Tag**	**VR**	**Type of Matching**	**Comment**
Query/Retrieve Level	0008, 0052	CS	Single Value	Study, Series
Study Level Keys				
Study Date	0008, 0020	DA	Universal, Range	
Study Time	0008, 0030	TM	Universal	
Accession Number	0008, 0050	SH	Universal	
Study Description	0008, 1030	LO	Universal	
Patient's Name	0010, 0010	PN	Single Value, Universal, WildCard	
Patient ID	0010, 0020	LO	Single Value, Universal, WildCard	
Patient's Birth Date	0010, 0030	DA	Single Value, Universal	
Other Patient IDs	0010, 1000	LO	Universal	
Study Instance UID	0020, 000D	UI	Universal	
Study ID	0020, 0010	SH	Universal	
Series Level Attributes For The Study Root Query/Retrieve Information Model				
Modality	0008, 0060	CS	Universal	
Series Instance UID	0020, 000E	UI	Universal	
Series Number	0020, 0011	IS	Universal	
Body Part Examined	0018, 0015	CS	Universal	

Table 43: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete – No final identifier is supplied	Successful completion of the query.

4.2.1.3.8 (Real-World) Activity – MOVE as SCU

4.2.1.3.8.1 Description and Sequencing of Activities

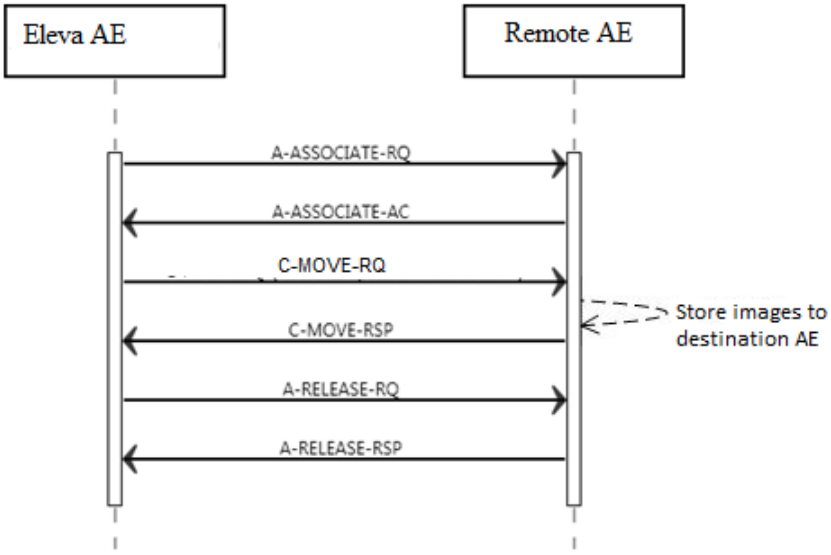

Figure 13: (Real World) Activity - MOVE as SCU

4.2.1.3.8.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 44: Proposed Presentation Contexts for (Real-World) Activity – MOVE as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.8.3 SOP Specific Conformance for MOVE SOP Class

4.2.1.3.8.3.1 SOP Specific Conformance for Patient Root QR Information Model – MOVE SOP Class

####### 4.2.1.3.8.3.1.1 Dataset Specific Conformance for Patient Root QR Information Model – MOVE SOP Class C-MOVE-SCU

Table 45: C-MOVE-RQ Dataset Specification (Patient Root)

Patient Root QR Information Model - MOVE SOP Class			
Attribute Name	Tag	VR	Comment
Query/Retrieve Level	0008, 0052	CS	Series

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 46: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete – No failures	Successful completion of the retrieve; also storage warnings may have occurred.

4.2.1.3.8.3.2 SOP Specific Conformance for Study Root QR Information Model – MOVE SOP Class

4.2.1.3.8.3.2.1 Dataset Specific Conformance for Study Root QR Information Model – MOVE SOP Class C-MOVE-SCU

Table 47: C-MOVE-RQ Dataset Specification (Study Root)

Study Root QR Information Model - MOVE SOP Class			
Attribute Name	**Tag**	**VR**	**Comment**
Query/Retrieve Level	0008, 0052	CS	Series

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 48: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete – No failures	Successful completion of the retrieve; also storage warnings may have occurred.
Failure	A900	Identifier does not match SOP Class	Retrieval is terminated
Cancel	FE00	Sub-operations terminated due to Cancel indication	Retrieval is terminated
Warning	B000	Sub-operations complete – One or more failures	Retrieval is terminated

4.2.1.3.9 (Real-World) Activity – Print Management as SCU

4.2.1.3.9.1 Description and Sequencing of Activities

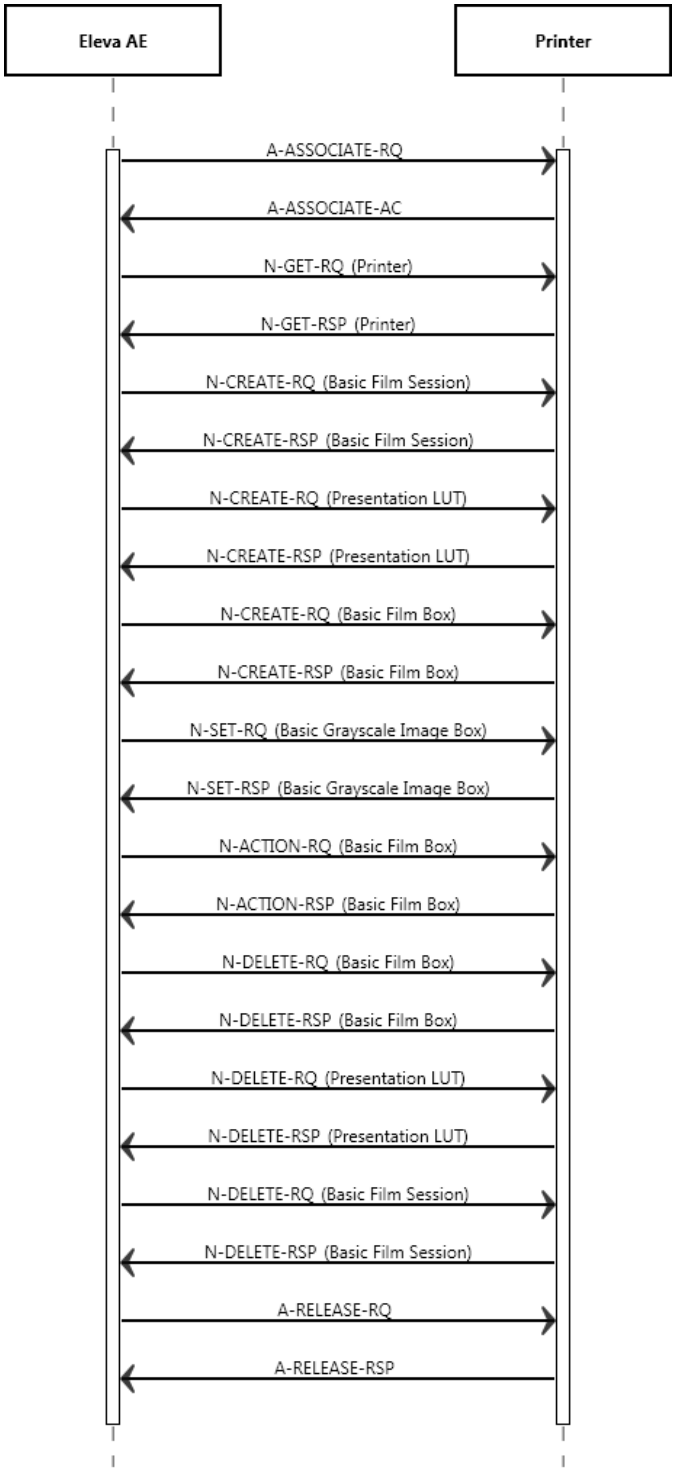

Figure 14: (Real World) Activity – Print Management as SCU

The ELEVA AE cannot handle any N-EVENT-REPORT messages.
A print job (film session) comprises one single film box with one single image (that is composed of 1...N modality images).

The print component in DigitalDiagnost C50 supports a highly automated print from acquisition operation mode, which does not interrupt the clinical acquisition workflow.

Supplementary to that is the manual print operation mode that is to be used as advanced interactive print preview and as reprint facility.

There can be two modes of configuration for automatic printing: auto and easy print.
In auto print mode conflicting and incomplete print jobs are either printed “as is” or must be manually corrected and confirmed. In easy print mode all automatically started print jobs have to be confirmed manually.The behavior of the print GUI on entry is dependent on the configuration not on the workflow context.

The three different print modes are:

- No auto print jobs active: Screen is empty.
- Auto print configured: All incomplete pages and conflict jobs are seen for that patient.
- Easy print configured: All current print jobs are seen for that patient.

By Manual Printing the basic composition of films is possible with click and point functions.
To allow for more automation, auto-arranging (AA) is required.
AA takes the configured defaults (2x1P 14x17) and loads the images automatically.
User can make multiple selections of images or all images select/deselect and pressed "arrange". Images are taken for AA in the order they have been selected, if this is relevent for the Templates if ALL images are selected, then they are taken in order from top left to lower right in rows. After AA the result can be modified manually.

By Auto Print the operation mode the handling of conflicts between configuration and operation is configurable. This means:
If the collimation and thus the image is larger as originally configured it can be configured if the image can be cut, scaled or the print job with the conflict can be manually corrected and confirmed.
If the operator omits one of the routine views configured and a page is thus left half-filled it can be configured if the page is going to be printed half-filled, if a layout suitable for the number of available images is chosen instead or if the page must be manually changed and confirmed.

In case of a manual check configured conflict jobs are sent to the print GUI and handled like the Easy Print.
Outstanding jobs are shown to the user by:

- An icon in the patient list at every affected patient / study
- User guidance giving patient name of unprinted film at the time the film ready to be printed

By Easy Print all print jobs are sent to the Print UI for checking first..
The user is not forced to go there, but outstanding jobs are shown to the user by:

- An icon in the patient list at every affected patient / study
- User guidance giving patient name of unprinted film at the time the film ready to be printed

Depending on the response status of set and the configuration the ELEVA AE may perform a retry.

4.2.1.3.9.2 Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 49: Proposed Presentation Contexts for (Real-World) Activity – Print Management As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Printer SOP Class	1.2.840.10008.5.1.1.16	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.9.3 SOP Specific Conformance for Basic Film Session SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc. Behavior of an Application Entity SOP class is summarized as shown in next Table. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

4.2.1.3.9.3.1 Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Table 50: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comments
Print Priority	2000,0020	CS	HIGH	ALWAYS	AUTO	
Medium Type	2000,0030	CS	Blue Film, Clear Film	ALWAYS	USER	
Film Destination	2000,0040	CS	PROCESSOR	ALWAYS	AUTO	
Film Session Label	2000,0050	LO	Philips Medical Systems	ANAP	AUTO	

The behavior of the Eleva AE for status responses in N-CREATE-SCU are summarized in next Table.

Table 51: Status Responses for N-CREATE-SCU

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Error	0106	Invalid Attribute Value	The user gets the message that the Print job is failed. Unable to connect to the printer.
Warning	0116	Any Warning	The print job continues and the status is logged.

4.2.1.3.9.4 SOP Specific Conformance for Printer SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.9.4.1 Dataset Specific Conformance for Printer SOP Class N-GET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Printer SOP Attribute Support:

An overview of the applied attributes in the applied Service Elements of the supported SOP Classes is presented in the next Tables. The tables use a number of abbreviations. The abbreviations used in the "Presence of …" column are:

ALWAYS Always Present
NEVER Never Present

The abbreviations used in the "Source" column:

USER the attribute value source is from User input
AUTO the attribute value is generated automatically.

Table 52: Printer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	
Date of Last Calibration	0018,1200	DA		ALWAYS	AUTO	
Time of Last Calibration	0018,1201	TM		ALWAYS	AUTO	
Printer Status	2110,0010	CS	FAILURE, NORMAL	ALWAYS	AUTO	Polling is not supported
Printer Status Info	2110,0020	CS	FILM JAM, RECEIVER FULL, SUPPLY EMPTY, SUPPLY LOW	ALWAYS	AUTO	
Printer Name	2110,0030	LO		ALWAYS	AUTO	

The behavior of the Eleva AE for status responses in N-GET-RQ are given in the next Table.

Table 53: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Error	XXXX	Any error	The association is aborted using A-ABORT. The print job will keep resubmitting the failed sheets until the error is solved or the retry time-out is exceeded
Warning	XXXX	Any warning	The print job continues and the warning is logged.

4.2.1.3.9.5 SOP Specific Conformance for Presentation LUT SOP Class of the Basic Grayscale Print Management Meta SOP Class

4.2.1.3.9.5.1 Dataset Specific Conformance for Presentation LUT SOP Class N-CREATE-SCU

Table 54: N-CREATE-RQ Dataset Specification

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS	AUTO	

4.2.1.3.9.6 SOP Specific Conformance for Basic Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.9.6.1 Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Table 55: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST	STANDARD\1, 1	ALWAYS	AUTO	
Film Orientation	2010,0040	CS	PORTRAIT, LANDSCAPE	ALWAYS	USER	User is able to select Portrait or Landscape orientation on the C50 UI. However, during the print job only one of them will be used. If needed, rendering will take care of the rotation of the image to be printed.
Film Size ID	2010,0050	CS	10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN, A3, A4	ALWAYS	USER	
Magnification Type	2010,0060	CS	NONE	ALWAYS	AUTO	
Max Density	2010,0130	US		ALWAYS	AUTO	
Trim	2010,0140	CS		ANAP	AUTO	
Configuration Information	2010,0150	ST	LUT = 0, 9	ANAP	AUTO	
Illumination	2010,015E	US		ANAP	AUTO	
Reflected Ambient Light	2010,0160	US			AUTO	

Table 56: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comments
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008, 1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008, 1155	UI		ALWAYS	AUTO	

Table 57: Printer Status Responses Handling behaviors

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Error	0106	Attribute Value out of Range	The user gets the message that the Print job is failed. Unable to connect to the printer.
	0105	Not defined	The user gets the message that the Print job is failed. Unable to connect to the printer.
Warning	0116	Attribute Value out of Range	The print job continues and the warning is logged.

4.2.1.3.9.6.2 Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

The behavior of the ACP-AE for status responses in N-ACTION response are shown in the following Table.

Table 58: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box Successfully created	The print job continues
Error	0119	Not defined	The association is aborted using A-ABORT and the print job is marked as failed. The failure reason is logged.
Warning	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	The print job continues and the warning is logged.

4.2.1.3.9.6.3 Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Not Supported.

4.2.1.3.9.7 SOP Specific Conformance for for Basic Grayscale Image Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

4.2.1.3.9.7.1 Dataset Specific Conformance for Basic Grayscale Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 59: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comments
Image Box Position	2020,0010	US		ALWAYS	AUTO	
Polarity	2020,0020	CS		ANAP	AUTO	
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comments
>Samples Per Pixel	0028,0002	US	1	ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	MONOCHROME1, MONOCHROME2	ALWAYS	CONFIG	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	Depending on the selected printer type and film size.
>Columns	0028,0011	US		ALWAYS	IMPLICIT	Depending on the selected printer type and film size.
>Bits Allocated	0028,0100	US	16, 8	ALWAYS	AUTO	
>Bits Stored	0028,0101	US	12, 8	ALWAYS	IMPLICIT	
>High Bit	0028,0102	US	11, 7	ALWAYS	AUTO	
>Pixel Representation	0028,0103	US	0x0000	ALWAYS	AUTO	
>Pixel Data	7FE0,0010	OW /OB		ALWAYS	AUTO	

4.2.1.3.9.8 SOP Specific Conformance for Basic Grayscale Print Management Meta SOP Class

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc. Behavior of an Application Entity SOP class is summarized as shown in next Table. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

Table 60: DICOM Command Response Status Handling Behavior for Grayscale Print Management Meta SOP Class

Service Status	Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Failure	XXXX	Any failure	In the AutoPrint mode a GUI is invoked. The status panel of this GUI displays a message based on the 'Further Meaning'. The warning or failure response of a print request that is invoked by the Manual Print Composer GUI will be displayed by a pop-up window (if the user has not closed the GUI before the printer status was delivered).
Warning	XXXX	Any warning	In the AutoPrint mode a GUI is invoked. The status panel of this GUI displays a message based on the 'Further Meaning'. The warning or failure response of a print request that is invoked by the Manual Print Composer GUI will be displayed by a pop-up window (if the user has not closed the GUI before the printer status was delivered).

The behavior of the AE during communication failure is summarized next table.

Table 61: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the command is marked as failed. The reason is logged. After a maximum number of retries the user is notified via pop-up (in preview mode only).

Exception	Behavior
Association aborted	The command is marked as failed. The reason is logged. After a maximum number of retries the user is notified via pop-up (in preview mode only).
Failed to connect	Log entry. After a maximum number of retries the user is notified via pop-up (in preview mode only).

4.2.1.4. Association Acceptance Policy

4.2.1.4.1 (Real-World) Activity – Verification as SCP

4.2.1.4.1.1 Description and Sequencing of Activities

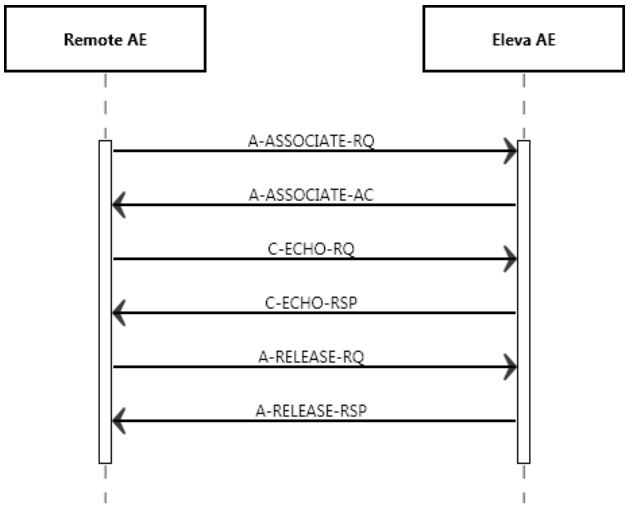

Figure 15: (Real World) Activity - Verification as SCP

The ELEVA AE accepts associations from systems that wish to verify application level communication using the C-ECHO command.

4.2.1.4.1.2 Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 62: Accepted Presentation Contexts for (Real-World) Activity – Verification as SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.4.1.3 SOP Specific Conformance for Verification SOP Class

This section includes the SOP specific behavior for the verification SOP Class, i.e. error codes, error and exception handling, time-outs, etc. This behavior is summarized in the tables below. The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

Table 63: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Verification is complete	The DigitalDiagnost C50 has successfully received the verification request.

Table 64: DICOM Command Communication Failure Behavior

Service Status	Behavior
Timeout	The Association is aborted using AP-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.3. Network Interfaces

4.3.1. Physical Network Interfaces

The DigitalDiagnost C50 provides DICOM 3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM 3.0 Standard. The DigitalDiagnost C50 system supports ISO 8802-3 10BASE-T and 100Base-TX Ethernet.

4.3.2. Additional Protocols

Not applicable. Additional protocols are not implemented by the product.

4.3.3. IPv4 and IPv6 Support

DigitalDiagnost C50 supports both IPv4 and IPv6 connections.

4.4. Configuration

Any implementation's DICOM conformance can be dependent upon configuration, which takes place at the time of installation. Issues concerning configuration is addressed in this section.

4.4.1. AE Title/Presentation Address Mapping

An important installation issue is the translation from AE title to presentation address. How this is to be performed can be described in this section.

4.4.1.1. Local AE Titles

The local AE title mapping and configuration are specified as:

Table 65: AE Title Configuration

Application Entity	Default AE Title	Default TCP/IP Port
ELEVA AE	ELEVA	3010

4.4.1.2. Remote AE Title/Presentation Address Mapping

All remote applications to be selected as destination (SCP) are configurable for the following items:

- The Application Entity Title of the remote application.
- The Presentation Address of where the remote application should accept association requests.

4.4.2. Parameters

The specification of important operational parameters, their default value and range (if configurable) is specified here.

Table 66: Configuration Parameters Table

Parameter	Configurable	Default Value
General Parameters		
Maximum PDU receive size	No	-
Maximum PDU send size	Yes	16384 bytes
Maximum number of simultaneous associations	Yes	2
ARTIM Timeout Specifies the time in seconds of the ARTIM (Association Request/Reject/Release Timer). Allowed values: 0: unlimited waiting time 0 < n: real time in seconds	Yes	20 [seconds]
Automatic Association Timeout Specifies the association inactivity timeout in seconds after which the association is closed automatically. Allowed values: -1: immediate timeout 0: unlimited waiting time 0 < n: real time in seconds	Yes	0 [unlimited]
Transfer Syntax support: ILE, ELE, EBE	Yes	ILE, ELE, EBE
Host Port	No	3010
Storage Specific Parameters		
Automatic export to a configurable destination	Yes	-
Storage Commitment Specific Parameters		
Storage Commit Max Reply Waiting Time Specifies the time in seconds that is waited for a storage commitment event report message. After this time the association will be terminated Allowed values: -1: immediate timeout 0: unlimited waiting time 0 < n: real time in seconds	Yes	-1 [asynchronous]
Basic Worklist Management Specific Parameters		
RIS query timeout Specifies the time after which the query is automatically aborted Allowed values: 1- 300 seconds	Yes	240 [seconds]
Background broad query time interval Specifies the time until the background query will be repeated. Allowed values: 0: no broad query 0 < n: real time in minutes	Yes	0 [no broad query]
Print Management Specific Parameters		
Automatic print to a configurable destination	Yes	-

5. Media Interchange

5.1. Implementation model

The implementation model can identify the DICOM Application Entities in a specific implementation and relate the Application Entities to Real-World Activities.

5.1.1. Application Data Flow Diagram

The DigitalDiagnost C50 1.1 system consists of one single application entity only: the ELEVA Application Entity.

Next figure shows the Media Interchange application data flow as a functional overview of the Eleva AE.

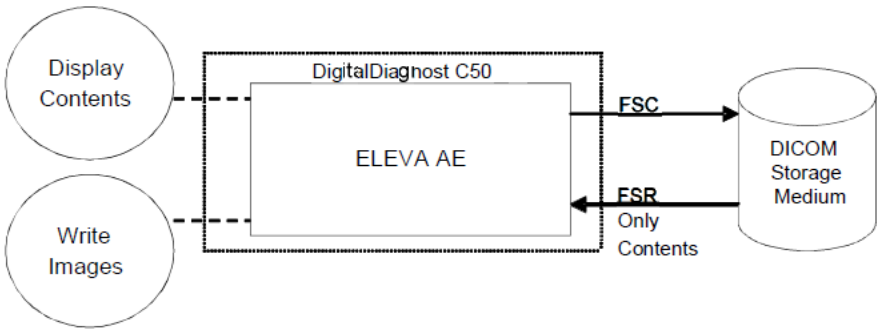

Figure 16: Media Interchange Application Data Flow Diagram

The ELEVA AE will act as a FSC/FSU when writing the selected images in a patient folder onto the CD-R/DVD medium.

5.1.2. Functional Definitions of AE's

The ELEVA AE is the one and only application entity within the DigitalDiagnost C50. It includes the following service class.

Media Storage Service Class

The ELEVA AE can perform the Media Storage service as SCU, with capabilities for RWA Create File-Set (as FSC/FSU).

5.1.3. Sequencing of Real World Activities

Write images can be initiated by selecting a proper export destination, selecting requested images and clicking the export button.

The ELEVA AE will compile the DICOMDIR and any required DICOM images into a CD/DVD session image; this CD session image will be written to CD/DVD.

5.2. AE Specifications

This section in the DICOM Conformance Statement specifies a set of Media Application Entities.

5.2.1. Eleva Media - Specification

The Eleva AE provides Standard Conformance to the DICOM Media Storage Service and File Format ([DICOM] PS 3.10) and the Media Storage Application Profiles STD-GEN-CD ([DICOM] PS 3.11).

Table 67: AE Eleva related Application Profiles, RWA activities and roles

Supported Application Profile	Identifier	Real-World Activities	Roles
General Purpose CD-R Interchange	STD-GEN-CD	Update File-read	FSR
		Create File-set	FSC
General Purpose DVD Interchange with JPEG	STD-GEN-DVD-JPEG	Update File-read	FSR
		Create File-set	FSC

5.2.1.1. File Meta Information for the Eleva

Table 68: File Meta Information for the Eleva

Implementation Class UID	1.3.46.670589.30.42.0
Implementation Version Name	PMS_ELEVA_42.0

5.2.1.2. Real-World Activities

The AE specification contains a description of the Real-World Activities, which invoke the particular AE.

5.2.1.2.1 RWA - Create File-set

When an image transfer to CD-R/DVD is initiated then the Eleva AE acts as an FSC or FSU using the interchange option to export SOP Instances from the local database to a CD-R/DVD medium.

5.2.1.2.1.1 Media Storage Application Profile

The Eleva AE supports the RWA - Create File-SET for the STD-GEN-CD Application Profile and the General Purpose DVD Interchange with JPEG Application Profile.

5.2.1.2.1.1.1 Options

The DICOMDIR file will be created on the CD-R/DVD medium when new images are written. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition in DICOM Media, a generated value will filled in. The Eleva AE can write created image to media of the following listed SOP Classes.

Table 69: AE related storage SOP Classes for Media

SOP Class Name	SOP Class UID
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage - Presentation SOP Class	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - Processing SOP Class	1.2.840.10008.5.1.4.1.1.1.1.1
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

The ELEVA AE can write created image to media with the following listed Transfer Syntax.

Table 70: AE related Transfer Syntax for Media

Transfer Syntax	UID List
Explicit VR Little Endian	1.2.840.10008.1.2.1

The ELEVA AE can write created image to media with the following listed Media Storage SOP Class.

Table 71: AE Media Store SOP Class

Media Storage SOP Class Name	Media Storage SOP Class UID
Media Storage Directory Storage	1.2.840.10008.1.3.10

It is possible to Store one single image first as a DICOM CR object and secondly as a DICOM DX object, therefore the "SOP Instance UIDs" and "Referenced SOP Instance UIDs" of both DICOM image instances have to be different.

The Numbering Scheme shall support 'Hanging Protocols' of PACS systems & Viewing Stations, in case of the CR as well as the DX model:

- The Series Number starts with 1 for the first Series of every Study Instance, identified by Study Instance UID.
- The "Series Number" increases by 1 for every new Series Instance within the same Study Instance, by the timely order, the Series Instances are created.
- Every Stored image gets also a unique "Series Instance UID" and "Media Storage SOP Instance UID".
- The Image Number starts with 1 for every new Series Instance.
- The Image Number increases by 1 for every new Image Instance within the same Series Instance, by the timely order, the Images are created.

Table 72: Supported attributes in the DICOMDIR

DICOM Tag	Description
0002, 0000	Meta Element Group Length
0002, 0001	File Meta Information Version
0002, 0002	Media Storage SOP Class UID
0002, 0003	Media Storage SOP Instance UID
0002, 0010	Transfer Syntax UID
0002, 0012	Implementation Class UID
0002, 0013	Implementation Version Name
File Set and Directory Information	
0004, 1130	File Set ID
0004, 1200	Offset Of The First Directory Record Of The Root Directory Entity
0004, 1202	Offset Of The Last Directory Record Of The Root Directory Entity
0004, 1212	File Set Consistency Flag
0004, 1220	Directory Record Sequence
Patient Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0010, 0010	Patients Name
0010, 0020	Patient ID
Study Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0008, 0020	Study Date
0008, 0030	Study Time
0008, 0050	Accession Number
0008, 1030	Study Description

DICOM Tag	Description
0020, 000d	Study Instance UID
0020, 0010	Study ID
Series Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0008, 0060	Modality
0008, 103e	Series Description
0018, 0015	Body Part Examined
0018, 1030	Protocol Name
0020, 000e	Series Instance UID
0020, 0011	Series Number
Image Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0004, 1500	Referenced File ID
0004, 1510	Referenced SOP Class UID In File
0004, 1511	Referenced SOP Instance UID In File
0004, 1512	Referenced Transfer Syntax UID In File
0008, 0008	Image Type
0008, 0016	SOP Class UID
0008, 0018	SOP Instance UID
0020, 0013	Instance Number
0028, 0010	Rows
0028, 0011	Columns

5.3. Augmented and Private Application Profiles

ELEVA does not support any augmented or private application profiles.

5.4. Media Configuration

When creating a CD with anonymous patient data, the following attributes are changed.

Table 73: Anonymous patient data

Attribute	Tag	Change to
Media Storage SOP Instance UID	0002, 0003	New UID
Referenced SOP Instance UID in File	0004, 1511	New UID
SOP Instance UID	0008, 0016	New UID
Accession Number	0008, 0050	[empty]
Institution Name	0008, 0080	[empty]
Institution Address	0008, 0081	[empty]
Referring Physician's Name	0008, 0090	[empty]

Attribute	Tag	Change to
Station Name	0008, 1010	[empty]
Study Description	0008, 1030	[empty]
Series Description	0008, 103E	[empty]
Institutional Department Name	0008, 1040	[empty]
Performing Physician's Name	0008, 1050	[empty]
Operators' Name	0008, 1070	[empty]
Patient Name	0010, 0010	[empty]
Patient ID	0010, 0020	New ID
Patient's Birth Date	0010, 0030	[empty]
Patient's Sex	0010, 0040	[empty]
Other Patient IDs	0010, 1000	[empty]
Patient's Size	0010, 1020	[empty]
Patient's Weight	0010, 1030	[empty]
Device Serial Number	0018, 1000	New ID
Study Instance UID	0020, 000D	New UID
Series Instance UID	0020, 000E	New UID
Study ID	0020, 0010	New ID
Requesting Physician	0032, 1032	[empty]
Request Attributes Sequence	0040, 0270	[empty sequence]
Requested Procedure ID	0040, 1001	New ID

6. Support of Character Sets

Any support for character sets in Network and Media services is described here.

Table 74: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 100	G1	Supplementary set of ISO 8859
		-	ISO-IR 6	G0	ISO 646

7. Security

7.1. Security Profiles

DigitalDiagnost C50 conforms to the IHE Basic Security Integration Profile. DigitalDiagnost C50 allows the use of either a conventional (non-secure) DICOM communication or a secure DICOM communication based on the Transport Layer Security (TLS) 1.2 protocol. If configured DigitalDiagnost C50 supports the following security measures:

- secure authentication of a node
- integrity and confidentiality of transmitted data
- confidentiality of data on DICOM Media
- generation of audit trail records access control and user authentication

7.1.1. Security USse Profiles

Not Applicable. Security Use profiles are not impleted by the product.

7.1.2. Security Transport Connection Profiles

DigitalDiagnost C50 conforms to the Basic TLS Secure Transport Connection Profile. DigitalDiagnost C50 initiates TLS Connections and accepts TLS Connections with Storage Commitment. TLS ports are configurable. DigitalDiagnost C50 provides a service accessible tool to configure private keys and certificates of the local and remote DICOM nodes.

Secure communication is a “mode of operation” of DigitalDiagnost C50 supported by the implementation of the DICOM Basic TLS Secure Transport Connection Profile. This functionality will be used by the nodes that can authenticate each other before they exchange DICOM information. For secure communication the TLS protocol v1.2 is used which provides message authentication, integrity, and confidentiality. Confidentiality is optional and can be controlled by the encryption settings.

DigitalDiagnost C50 can communicate using the following Cipher Suites:
TLS_RSA_WITH_NULL_SHA (Node authentication without encryption)
TLS_RSA_WITH_AES_128_CBC_SHA (Node authentication with encryption)

DigitalDiagnost C50 supports X.509 certificates. The following TLS Certification checks will be done (TLS Handshake). The machine (either server or client) that will send its certificate will:

- Choose the certificate according to Common Name (CN) value in the Subject-field. This name is case-sensitive. All present certificates should have unique CN names
- The server verifies
  - that the client certificate is a X.509 certificate which is not tampered with
  - that the client certificate is in the list of trusted certificates
  - that the client certificate is not expired (present time is between "Valid From" and "Valid To" fields of the X.509 certificate)
  - that the client certificate has the correct purpose (at least the Client Authentication purpose)
- The client verifies that
  - that the server certificate is a X.509 certificate which is not tampered with
  - that the server certificate is in the list of trusted certificates
  - that the server certificate is not expired (present time is between "Valid From" and "Valid To" fields of the X.509 certificate)
  - that the server certificate has the correct purpose (at least Server Authentication purpose).

No verification is done on:

- Revocation of certificates
- Limiting the connection to a limited set of IP-addresses

Node authentication with or without encryption is only possible when both nodes have:

- An access to their own private keys
- An access to a copy of the certificate of the other node containing its public key

Figure below presents the message flow of TLS handshake supported by DigitalDiagnost C50.

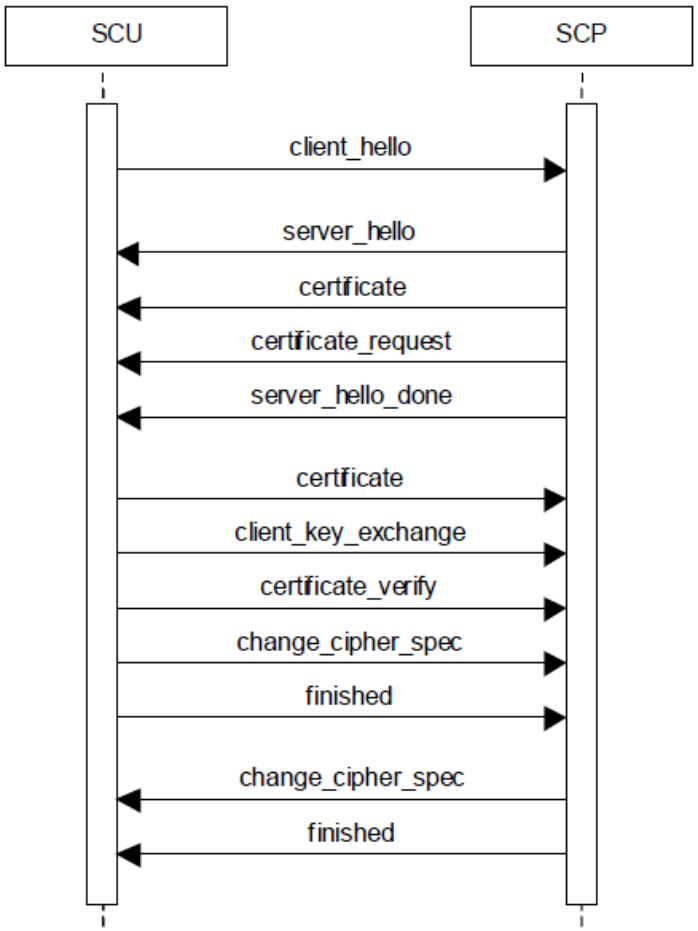

Figure 17: Message flow of TLS handshake

7.1.3. Digital Signature Profiles

Not Applicable. Digital Signature Profiles are not implemented by the product.

7.1.4. Media Storage Security Profiles

Not Applicable. Media Storage Security Profiles are not implemented by the product.

7.1.5. Attribute Confidentiality Profiles

DigitalDiagnost C50 conforms to the Basic Application Level Confidentiality Profile as de-identifier.
De-identified SOP Instances will be created on DICOM Media if specified by the user.
No instances of the Encrypted Attributes Data Set are created. No Transfer Syntaxes are supported for encoding/decoding of Encrypted Attributes Data Sets.
Table 7263 lists the protected attributes as defined in [DICOM], Part 15. It can contain attributes which are currently not part of images created by DigitalDiagnost C50. The terms used to describe the replacement value can be read as follows.
Empty: The attribute will have a value of zero length.

n. a.: Not applicable, the attribute is not contained in the standard IOD of DigitalDiagnost C50
anon string: The original value is mapped onto a string with a length of max 12 characters UID using the procedure described below.
anon UID: The original value is mapped onto a syntactically valid DICOM UID using the procedure described below.

The above mentioned mapping procedure works as follows:

- The original value is taken as a string of arbitrary length.
- This string is mapped onto a 16-byte value using MD5 hash.
- From this value only the first 8 bytes are used further.
  - To create an anon string these first 8 bytes are mapped onto a 12 characters long string using base 64.
  - To create an anon UID the 8 bytes are read as two integers which are used together with the Implementation Class UID and the device serial number to create a valid DICOM UID: (ImplClassUID).(DevSerialNu).2.Integer(byte[0 3]).Integer(byte[4¬ 7]).

MD5 hash makes practically sure that different strings are mapped to different 16-byte values. So the whole procedure ensures that the relationship between SOP Instances by the means of their UIDs remains consistent.

Table 75: Anonymous attributes supported by DigitalDiagnost C50

Attribute	Tag	Replacement Value
Instance Creator UID	0008,0014	anon UID
SOP Instance UID	0008,0018	anon UID
Accession Number	0008,0050	anon string
Institution Name	0008,0080	empty
Institution Address	0008,0081	empty
Referring Physician's Name	0008,0090	empty
Station Name	0008,1010	empty
Study Description	0008,1030	empty
Series Description	0008,103E	empty
Institutional Department Name	0008,1040	empty
Physician(s) of Record	0008,1048	empty
Performing Physicians' Name	0008,1050	empty
Name of Physician(s) Reading Study	0008,1060	empty
Operators' Name	0008,1070	empty
Admitting Diagnoses Description	0008,1080	empty
Referenced SOP Instance UID	0008,1155	anon UID
Derivation Description	0008,2111	empty
Patient's Name	0010,0010	anon string
Patient ID	0010,0020	anon string
Patient's Birth Date	0010,0030	empty
Patient's Birth Time	0010,0032	empty
Patient's Sex	0010,0040	empty
Other Patient Ids	0010,1000	empty
Other Patient Names	0010,1001	empty
Patient's Age	0010,1010	empty
Patient's Size	0010,1020	"0"
Patient's Weight	0010,1030	"0"

Attribute	Tag	Replacement Value
Ethnic Group	0010,2160	empty
Occupation	0010,2180	empty
Additional Patient's History	0010,21B0	empty
Patient Comments	0010,4000	empty
Device Serial Number	0018,1000	anon string
Protocol Name	0018,1030	empty
Study Instance UID	0020,000D	anon UID
Series Instance UID	0020,000E	anon UID
Study ID	0020,0010	empty
Frame of Reference UID	0020,0052	anon UID
Image Comments	0020,4000	empty
Requesting Physician	0032,1032	"xxxxxxx"
Requested Procedure ID	0040,1001	"xxxxxxx"
UID	0040,A124	anon UID
Content Sequence	0040,A730	empty
Storage Media File-set UID	0088,0140	anon UID

No attributes or attribute values are inserted.

7.1.6. Network Address Management Profiles

Not applicable. Network Address Management Profiles are not implemented by the product.

7.1.7. Time Synchronization Profiles

DigitalDiagnost C50 conforms to the Basic Time Synchronization Profile as NTP Client. DigitalDiagnost C50 does support secure transactions.

7.1.8. Application Configuration Management Profiles

Not applicable. Application Configuration Management Profiles are not implemented by the product.

7.1.9. Audit Trail Profiles

DigitalDiagnost C50 creates audit messages according to the IHE Basic Security Integration Profile. These messages can contain information that identifies the patient. The following messages will be created and sent to a central Audit Record Repository:

- Application Activity (when DigitalDiagnost C50 starts or shuts down).
- Begin Transferring DICOM Instances (when an examination is being transferred from the DigitalDiagnost C50 to a remote network node).
- DICOM Instances Transferred (when an examination is transferred from the DigitalDiagnost C50 to a remote network node).
- DICOM Instances Accessed (Study is created, modified, accessed, or deleted).
- User Authentication (when the user logs in or logs out).
- SecurityAlert (when an authentication of a secure node during TLS negotiation fails, e.g. due to an invalid certificate and configuration and other changes).
- Export (when printing job is started or export on media e.g. CD, DVD).

7.2. Association Level Security

Not applicable. Association Level Security is not implemented by the product.

7.3. Application Level Security

DigitalDiagnost C50 does not support any specific application level security measures. The Application which gives access to Patient records and DICOM communication requires Login with Username and Password. The system is used within a secured environment. It is assumed that a secured environment includes at a minimum.

- Firewall or router protections to ensure that only approved external hosts have network access to DigitalDiagnost C50.
- Firewall or router protections to ensure that DigitalDiagnost C50 only has network access to approved external hosts and services.
- Any communication with external hosts outside the locally secured environment can be configured to use secure network channels.
- A local Antivirus client should be installed to protect against malicious software.

Other network security procedures such as automated intrusion detection can be appropriate in some environments.
Additional security features can be established by the local security policy and are beyond the scope of this conformance statement

8. Annexes of application "ELEVA"

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created by this application.
This section specifies each IOD created (including private IOD's). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a Value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

8.1.1.1. List of created SOP Classes

Table 76: List of created SOP Classes

SOP Class Name	SOP Class UID
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage - For Presentation. SOP	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing. SOP	1.2.840.10008.5.1.4.1.1.1.1.1
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67

8.1.1.1.1 Computed Radiography Image Storage SOP Class

Table 77: IOD of Created Computed Radiography Image Storage SOP Class Instances

Information Entity	Module	Presence
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
	CR Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL Required if contrast media is used
	Display Shutter Module	CONDITIONAL
	CR Image Module	ALWAYS
	Overlay Plane Module	ALWAYS
	Modality LUT Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 78: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	MWL, USER	
Patient ID	0010,0020	LO		ALWAYS	MWL, AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	MWL, USER	
Patient's Sex	0010,0040	CS	F, M, O	VNAP	MWL, USER	
Ethnic Group	0010,2160	SH		ANAP	AUTO	
Patient Comments	0010,4000	LT		ANAP	MWL, USER	
Issuer of Patient ID	0010,0021	LO		ANAP	MWL, USER	

Table 79: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	
Study Description	0008,1030	LO		ANAP	MWL, USER	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	UL		ALWAYS	AUTO	
Referenced Study Sequence	0008,1110	SQ		ANAP	EMPTY	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study ID	0020,0010	SH		VNAP	AUTO, MWL	
Requesting Service	0032,1033	LO		ANAP	MWL, USER	

Table 80: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	MWL, USER	
Patient's Size	0010,1020	DS		ANAP	MWL, USER	
Patient's Weight	0010,1030	DS		ANAP	MWL, USER	
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	
Allergies	0010,2110	LO		ANAP	MWL, USER	
Additional Patient History	0010,21B0	LT		ANAP	MWL, USER	
Pregnancy Status	0010,21C0	US		ANAP	MWL, USER	
Patient State	0038,0500	LO		ANAP	MWL, USER	

Table 81: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Modality	0008,0060	CS	CR	ALWAYS	CONFIG	
Series Description	0008,103	LO		ANAP	MPPS, USER	
Performing Physicians' Name	0008,1050	PN		ANAP	MPPS, USER	
Operators' Name	0008,1070	PN		ALWAYS	MPPS, USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Body Part Examined	0018,0015	CS		ALWAYS	MPPS, USER	
Protocol Name	0018,1030	LO		ALWAYS	MWL, USER	
Series Instance UID	0020,000E	UI		ALWAYS	MPPS, AUTO	
Series Number	0020,0011	IS		ALWAYS	MPPS, AUTO	
Laterality	0020,0060	CS		ANAP	CONFIG	
Performed Procedure Step	0040,0244	DA		ANAP	MPPS, AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Start Date						
Performed Procedure Step Start Time	0040,0245	TM		ANAP	MPPS, AUTO	
Performed Procedure Step End Date	0040,0250	DA		ANAP	MPPS, AUTO	
Performed Procedure Step End Time	0040,0251	TM		ANAP	MPPS, AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	MPPS,AUTO	
Performed Procedure Step Description	0040,0254	LO		ANAP	MPPS, AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	MWL	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO	

Table 82: CR Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Body Part Examined	0018,0015	CS		VNAP	MPPS, USER	
View Position	0018,5101	CS		VNAP	AUTO	

Table 83: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		ALWAYS	CONFIG	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Address	0008,0081	ST		ALWAYS	CONFIG	
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Institutional Department Name	0008,1040	LO		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO	DigitalDiagnost C50	ALWAYS	FIXED	
Device Serial Number	0018,1000	LO		ALWAYS	CONFIG	
Software Versions	0018,1020	LO	1.1.4	ALWAYS	FIXED	
Spatial Resolution	0018,1050	DS		ALWAYS	AUTO	

Table 84: General Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	AUTO	
Acquisition DateTime	0018,5101	CS		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ANAP	AUTO	
Irradiation Event UID	0008,3010	UI		ANAP	AUTO	
Acquisition Number	0020,0012	IS		ANAP	AUTO	
Images in Acquisition	0020,1002	IS		ANAP	AUTO	

Table 85: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: ORIGINAL, Value 2: PRIMARY	ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Quality Control Image	0028,0300	CS		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	
Presentation LUT Shape	2050,0020	CS		ALWAYS	AUTO	

Table 86: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	
Bits Stored	0028,0101	US	10, 12, 15	ALWAYS	AUTO	When Parameter “Increase virtual depth for PACS” is

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						enabled values are : 16,13,11
High Bit	0028,0102	US	9, 11, 14	ALWAYS	AUTO	When Parameter “Increase virtual depth for PACS” is enabled values are : 15,12,10
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW /OB		ALWAYS	AUTO	

Table 87: Contrast/Bolus Module Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	USER	

Table 88: Display Shutter Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shutter Shape	0018,1600	CS		ALWAYS	AUTO	
Vertices of the Polygonal Shutter	0018,1620	IS		ANAP	AUTO	

Table 89: CR Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		ANAP	AUTO	
Exposure Time	0018,1150	IS		ANAP	AUTO	
Exposure	0018,1152	IS		ANAP	AUTO	
Exposure in µAs	0018,1153	IS		ANAP	AUTO	
Imager Pixel Spacing	0018,1164	DS		ALWAYS	AUTO	
Acquisition Device Processing Description	0018,1400	LO		ANAP	AUTO	
Relative X-Ray Exposure	0018,1405	IS		ANAP	AUTO	
Exposure Index	0018,1411	DS		ANAP	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ANAP	AUTO	

Table 90: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	6000,0010	US		ALWAYS	AUTO	
Overlay Columns	6000,0011	US		ALWAYS	AUTO	
Overlay Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Origin	6000,0050	SS		ALWAYS	AUTO	
Overlay Bits Allocated	6000,0100	US		ALWAYS	AUTO	
Overlay Bit Position	6000,0102	US		ALWAYS	AUTO	
Overlay Data	6000,3000	OW		ALWAYS	AUTO	

Table 91: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Rescale Type	0028,1054	LO	US	ALWAYS	AUTO	

Table 92: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	
VOI LUT Function	0028,1056	CS		ANAP	AUTO	

Table 93: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.2 Digital X-Ray Image Storage - For Pres. SOP Class

Table 94: SOP Class Module

Information Entity	Module	Presence
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
	DX Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL Required if contrast media is used
	Display Shutter Module	CONDITIONAL
	DX Anatomy Imaged Module	ALWAYS
	DX Image Module	ALWAYS
	DX Detector Module	ALWAYS
	X-Ray Collimator	CONDITIONAL
	DX Positioning Module	CONDITIONAL
	X-Ray Acquisition Dose Module	CONDITIONAL
	X-Ray Generation Module	CONDITIONAL

Information Entity	Module	Presence
	X-Ray Filtration Module	CONDITIONAL
	Overlay Plane Module	CONDITIONAL Required if graphic annotation is present
	VOI LUT Module	CONDITIONAL Required if Presentation Intent Type (0008,0068) is FOR PRESENTATION
	Acquisition Context Module	ALWAYS
	SOP Common Module	ALWAYS

Table 95: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	MWL, USER	
Patient ID	0010,0020	LO		VNAP	MWL, AUTO	
Issuer of Patient ID	0010,0021	LO		ANAP	MWL, USER	
Patient's Birth Date	0010,0030	DA		VNAP	MWL, USER	
Patient's Sex	0010,0040	CS		VNAP	MWL, USER	
Ethnic Group	0010,2160	SH		ANAP	MWL, USER	
Patient Comments	0010,4000	LT		ANAP	MWL, USER	

Table 96: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	
Study Description	0008,1030	LO		ANAP	MWL, USER	
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
Referenced Study Sequence	0008,1110	SQ		ANAP	EMPTY	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	MPPS, AUTO	
Requesting Service	0032,1033	LO		VNAP	MWL, USER	

Table 97: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	MWL, USER	
Patient's Size	0010,1020	DS		ANAP	MWL, USER	
Patient's Weight	0010,1030	DS		ANAP	MWL, USER,	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	
Allergies	0010,2110	LO		ANAP	MWL, USER	
Additional Patient History	0010,21B0	LT		ANAP	MWL, USER	
Pregnancy Status	0010,21C0	US		ANAP	MWL, USER	
Patient State	0038,0500	LO		ANAP	MWL, USER	

Table 98: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP	MPPS, USER	
Performing Physicians' Name	0008,1050	PN		ANAP	MPPS, USER	
Operators' Name	0008,1070	PN		ANAP	MPPS, USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Body Part Examined	0018,0015	CS		ANAP	MPPS	
Protocol Name	0018,1030	LO		ANAP	MWL, USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	MPPS, AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	MPPS, AUTO	
Performed Procedure Step End Date	0040,0250	DA		ANAP	MPPS, AUTO	
Performed Procedure Step End Time	0040,0251	TM		ANAP	MPPS, AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	MPPS, AUTO	
Performed Procedure Step Description	0040,0254	LO		ANAP	MPPS, AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	
>Requested Procedure	0032,1060	LO		ANAP	MWL	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Description						
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	MWL	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO	

Table 99: DX Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	DX	ALWAYS	CONFIG	
Presentation Intent Type	0008,0068	CS	FOR PRESENTATION	ALWAYS	FIXED	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 100: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		ANAP	CONFIG	
Institution Address	0008,0081	ST		ANAP	CONFIG	
Station Name	0008,1010	SH		ANAP	CONFIG	
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	
Manufacturer's Model Name	0008,1090	LO	DigitalDiagnost C50	ALWAYS	FIXED	
Device Serial Number	0018,1000	LO		ANAP	CONFIG	
Software Versions	0018,1020	LO	1.1.4	ALWAYS	FIXED	
Spatial Resolution	0018,1050	DS		ANAP	AUTO	

Table 101: General Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	AUTO	
Acquisition DateTime	0018,5101	CS		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Time	0008,0032	TM		ANAP	AUTO	
Irradiation Event UID	0008,3010	UI		ANAP	AUTO	
Acquisition Number	0020,0012	IS		ANAP	AUTO	
Images in Acquisition	0020,1002	IS		ANAP	AUTO	

Table 102: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: ORIGINAL, Value 2: PRIMARY	ANAP	AUTO	
Content Date	0008,0023	DA		ANAP	AUTO	
Content Time	0008,0033	TM		ANAP	AUTO	
Anatomic Region Sequence	0008,2218	SQ		ANAP	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Image Laterality	0020,0062	CS		ANAP	USER, AUTO	
Quality Control Image	0028,0300	CS		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ANAP	AUTO	
Lossy Image Compression	0028,2110	CS	00	ANAP	AUTO	
Presentation LUT Shape	2050,0020	CS	IDENTITY	ANAP	AUTO	

Table 103: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	
Bits Stored	0028,0101	US	10, 12, 15	ALWAYS	CONFIG	When Parameter “Increase virtual depth for PACS” is enabled values are : 16,13,11
High Bit	0028,0102	US	9, 11, 14	ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW /OB		ALWAYS	AUTO	

Table 104: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	USER	

Table 105: Display Shutter Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shutter Shape	0018,1600	CS		ALWAYS	AUTO	
Vertices of the Polygonal Shutter	0018,1620	IS		ANAP	AUTO	

Table 106: DX Anatomy Imaged Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Anatomic Region Sequence	0008,2218	SQ		VNAP	AUTO	
Image Laterality	0020,0062	CS		ALWAYS	AUTO	

Table 107: DX Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: ORIGINAL, Value 2: PRIMARY`	ALWAYS	AUTO	
Acquisition Device Processing Description	0018,1400	LO		ANAP	AUTO	
Patient Orientation	0020,0020	CS		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	
Bits Stored	0028,0101	US	15, 12, 10	ALWAYS	CONFIG	When Parameter “Increase virtual depth for PACS” is enabled values are : 16,13,11
High Bit	0028,0102	US	14, 11, 9	ALWAYS	AUTO	When Parameter “Increase virtual depth for PACS” is enabled values are : 15,12,10
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ALWAYS	CONFIG	
Pixel Intensity Relationship	0028,1040	CS	LOG	ALWAYS	AUTO	
Pixel Intensity Relationship Sign	0028,1041	SS		ALWAYS	AUTO	
Window Center	0028,1050	DS		ANAP	AUTO	
Window Width	0028,1051	DS		ANAP	AUTO	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Rescale Type	0028,1054	LO		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS	00 or 01	ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS	AUTO	

Table 108: DX Detector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Imager Pixel Spacing	0018,1164	DS		ALWAYS	AUTO	
Exposure Index	0018,1411	DS		ANAP	AUTO	
Detector Temperature	0018,7001	DS		ANAP	AUTO	
Detector Type	0018,7004	CS		VNAP	AUTO	
Detector Mode	0018,7008	LT		ANAP	AUTO	
Detector ID	0018,700A	SH		ANAP	AUTO	
Date of Last Detector Calibration	0018,700C	DA		ANAP	AUTO	
Time of Last Detector Calibration	0018,700E	TM		ANAP	AUTO	
Detector Time Since Last Exposure	0018,7012	DS		ANAP	AUTO	
Detector Manufacturer Name	0018,702A	LO		VNAP	AUTO	
Detector Manufacturer's Model Name	0018,702B	LO		ANAP	AUTO	
Field of View Origin	0018,7030	DS		ANAP	AUTO	
Field of View Rotation	0018,7032	DS		ANAP	AUTO	
Field of View Horizontal Flip	0018,7034	CS		ANAP	AUTO	
Pixel Spacing	0028,0030	DS		ANAP	AUTO	

Table 109: X-Ray Collimator

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Collimator Shape	0018,1700	CS		ALWAYS	AUTO	
Collimator Left Vertical Edge	0018,1702	IS		ANAP	AUTO	
Collimator Right Vertical Edge	0018,1704	IS		ANAP	AUTO	
Collimator Upper Horizontal Edge	0018,1706	IS		ANAP	AUTO	
Collimator Lower Horizontal Edge	0018,1708	IS		ANAP	AUTO	

Table 110: DX Positioning Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Estimated Radiographic Magnification Factor	0018,1114	DS		ANAP	AUTO	
Positioner Type	0018,1508	CS		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
View Position	0018,5101	CS		ANAP	AUTO	

Table 111: X-Ray Acquisition Dose Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		ANAP	AUTO	
Exposure Time	0018,1150	IS		ANAP	AUTO	
Exposure	0018,1152	IS		ANAP	AUTO	
Exposure in µAs	0018,1153	IS		ANAP	AUTO	
Image and Fluoroscopy Area Dose Product	0018,115E	DS		ANAP	AUTO	
Relative X-Ray Exposure	0018,1405	IS		ANAP	AUTO	
Exposure Index	0018,1411	DS		ANAP	AUTO	
Filter Material	0018,7050	CS		ANAP	AUTO	
Exposure Time in µS	0018,8150	DS		ANAP	AUTO	
Entrance Dose	0040,0302	US		ANAP	AUTO	
Comments on Radiation Dose	0040,0310	ST		ANAP	AUTO	
Entrance Dose in mGy	0040,8302	DS		ANAP	AUTO	

Table 112: X-Ray Generation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		ANAP	AUTO	
Exposure Time	0018,1150	IS		ANAP	AUTO	
Exposure	0018,1152	IS		ANAP	AUTO	
Exposure in µAs	0018,1153	IS		ANAP	AUTO	
Exposure Time in µS	0018,8150	DS		ANAP	AUTO	

Table 113: X-Ray Filtration Module Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Filter Material	0018,7050	CS		ANAP	AUTO	

Table 114: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	6000,0010	US		ALWAYS	AUTO	
Overlay Columns	6000,0011	US		ALWAYS	AUTO	
Overlay Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Origin	6000,0050	SS		ALWAYS	AUTO	
Overlay Bits Allocated	6000,0100	US		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Bit Position	6000,0102	US		ALWAYS	AUTO	
Overlay Data	6000,3000	OW		ALWAYS	AUTO	

Table 115: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	
VOI LUT Function	0028,1056	CS		ANAP	AUTO	

Table 116: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO	

Table 117: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.1.1	ANAP	AUTO	
SOP Instance UID	0008,0018	UI		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.3 Digital X-Ray Image Storage - For Proc. SOP Class

Table 118: SOP Class Modules

Information Entity	Module	Presence
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
	DX Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL Required if contrast media is used
	Display Shutter Module	CONDITIONAL
	DX Anatomy Imaged Module	ALWAYS
	DX Image Module	ALWAYS

Information Entity	Module	Presence
	DX Detector Module	ALWAYS
	X-Ray collimator Module	CONDITIONAL
	DX Positioning Module	CONDITIONAL
	X-Ray Acquisition Dose Module	CONDITIONAL
	X-Ray Generation Module	CONDITIONAL
	X-Ray Filtration Module	CONDITIONAL
	VOI LUT Module	CONDITIONAL
	Overlay Plane Module	CONDITIONAL Required if graphic annotation is present
	Acquisition Context Module	ALWAYS
	SOP Common Module	ALWAYS

Table 119: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	MWL, USER	
Patient ID	0010,0020	LO		ALWAYS	MWL, AUTO	
Issuer of Patient ID	0010,0021	LO		ANAP	MWL, USER	
Patient's Birth Date	0010,0030	DA		VNAP	MWL, USER	
Patient's Sex	0010,0040	CS	F, M, O	VNAP	MWL, USER	
Ethnic Group	0010,2160	LT		ANAP	MWL, USER	
Patient Comments	0010,4000	LT		ANAP	MWL, USER	

Table 120: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	MPPS	
Study Time	0008,0030	TM		ALWAYS	MPPS	
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	
Study Description	0008,1030	LO		ANAP	MWL, USER	
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
Referenced Study Sequence	0008,1110	SQ		ANAP	EMPTY	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO, MPPS	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requesting Service	0032,1033	LO		VNAP	MWL, USER	

Table 121: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	MWL, USER	
Patient's Size	0010,1020	DS		ANAP	MWL, USER	
Patient's Weight	0010,1030	DS		ANAP	MWL, USER	
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	
Allergies	0010,2110	LO		ANAP	MWL, USER	
Additional Patient History	0010,21B0	LT		ANAP	MWL, USER	
Pregnancy Status	0010,21C0	US		ANAP	MWL, USER	
Patient State	0038,0500	LO		ANAP	MWL, USER	

Table 122: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	MPPS	
Series Time	0008,0031	TM		ANAP	MPPS	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP	MPPS, USER	
Performing Physicians' Name	0008,1050	PN		ANAP	MPPS, USER	
Operators' Name	0008,1070	PN		ANAP	MPPS, USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Body Part Examined	0018,0015	CS		ANAP	MPPS, USER	
Protocol Name	0018,1030	LO		ANAP	MWL, USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO, MPPS	
Series Number	0020,0011	IS		VNAP	AUTO, MPPS	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO, MPPS	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO, MPPS	
Performed Procedure Step End Date	0040,0250	DA		ANAP	MPPS, AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Performed Procedure Step End Time	0040,0251	TM		ANAP	MPPS, AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO, MPPS	
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO, MPPS	
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	MWL	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO	

Table 123: DX Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	DX	ALWAYS	CONFIG	
Presentation Intent Type	0008,0068	CS	FOR PROCESSING	ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 124: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		ANAP	CONFIG	
Institution Address	0008,0081	ST		ANAP	CONFIG	
Station Name	0008,1010	SH		ANAP	CONFIG	
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	
Manufacturer's Model Name	0008,1090	LO	DigitalDiagnost C50	ALWAYS	FIXED	
Device Serial Number	0018,1000	LO		ANAP	CONFIG	
Software Versions	0018,1020	LO	1.1.4	ALWAYS	FIXED	
Spatial Resolution	0018,1050	DS		ANAP	AUTO	

Table 125: General Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	AUTO	
Acquisition DateTime	0018,5101	CS		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ANAP	AUTO	
Irradiation Event UID	0008,3010	UI		ANAP	AUTO	
Acquisition Number	0020,0012	IS		ANAP	AUTO	
Images in Acquisition	0020,1002	IS		ANAP	AUTO	

Table 126: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: ORIGINAL, Value 2: PRIMARY	ANAP	AUTO	
Content Date	0008,0023	DA		ANAP	AUTO	
Content Time	0008,0033	TM		ANAP	AUTO	
Anatomic Region Sequence	0008,2218	SQ		ANAP	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Image Laterality	0020,0062	CS		ANAP	USER, AUTO	
Quality Control Image	0028,0300	CS		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ANAP	AUTO	
Lossy Image Compression	0028,2110	CS	00	ANAP	AUTO	
Presentation LUT Shape	2050,0020	CS	INVERSE	ANAP	AUTO	

Table 127: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME1	ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	
Bits Stored	0028,0101	US	10, 12, 15	ALWAYS	CONFIG	When Parameter "Increase virtual depth for PACS" is enabled values are : 16,13,11
High Bit	0028,0102	US	9, 11, 14	ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW /OB		ALWAYS	AUTO	

Table 128: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	USER	

Table 129: Display Shutter Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shutter Shape	0018,1600	CS		ALWAYS	AUTO	
Vertices of the Polygonal Shutter	0018,1620	IS		ANAP	AUTO	

Table 130: DX Anatomy Imaged Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Anatomic Region Sequence	0008,2218	SQ		VNAP	AUTO	
Image Laterality	0020,0062	CS		ALWAYS	AUTO	

Table 131: DX Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	ORIGINAL, PRIMARY	ALWAYS	AUTO	
Acquisition Device Processing Description	0018,1400	LO		ANAP	AUTO	
Patient Orientation	0020,0020	CS		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME1	ALWAYS	AUTO	
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	
Bits Stored	0028,0101	US	15, 12, 10	ALWAYS	CONFIG	
High Bit	0028,0102	US	14, 11, 9	ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ALWAYS	CONFIG	
Pixel Intensity Relationship	0028,1040	CS	LOG	ALWAYS	AUTO	
Pixel Intensity Relationship Sign	0028,1041	SS	1	ALWAYS	AUTO	
Window Center	0028,1050	DS		ANAP	AUTO	
Window Width	0028,1051	DS		ANAP	AUTO	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Rescale Type	0028,1054	LO		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS		ALWAYS	AUTO	One of the value, 00 or 01
Presentation LUT Shape	2050,0020	CS	INVERSE	ALWAYS	AUTO	

Table 132: DX Detector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Imager Pixel Spacing	0018,1164	DS		ALWAYS	AUTO	
Exposure Index	0018,1411	DS		ANAP	AUTO	
Detector Temperature	0018,7001	DS		ANAP	AUTO	
Detector Type	0018,7004	CS		VNAP	AUTO	
Detector Mode	0018,7008	LT		ANAP	AUTO	
Detector ID	0018,700A	SH		ANAP	AUTO	
Date of Last Detector Calibration	0018,700C	DA		ANAP	AUTO	
Time of Last Detector Calibration	0018,700E	TM		ANAP	AUTO	
Detector Time Since Last Exposure	0018,7012	DS		ANAP	AUTO	
Detector Manufacturer Name	0018,702A	LO		ANAP	AUTO	
Detector Manufacturer's Model Name	0018,702B	LO		ANAP	AUTO	
Field of View Origin	0018,7030	DS		ANAP	AUTO	
Field of View Rotation	0018,7032	DS		ANAP	AUTO	
Field of View Horizontal Flip	0018,7034	CS		ANAP	AUTO	
Pixel Spacing	0028,0030	DS		ANAP	AUTO	

Table 133: X-Ray Collimator Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Collimator Shape	0018,1700	CS		ALWAYS	AUTO	
Collimator Left Vertical Edge	0018,1702	IS		ANAP	AUTO	
Collimator Right Vertical Edge	0018,1704	IS		ANAP	AUTO	
Collimator Upper Horizontal Edge	0018,1706	IS		ANAP	AUTO	
Collimator Lower Horizontal Edge	0018,1708	IS		ANAP	AUTO	

Table 134: DX Positioning Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Estimated Radiographic Magnification Factor	0018,1114	DS		ANAP	AUTO	
Positioner Type	0018,1508	CS		VNAP	AUTO	
View Position	0018,5101	CS		ANAP	AUTO	

Table 135: X-Ray Acquisition Dose Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		ANAP	AUTO	
Exposure Time	0018,1150	IS		ANAP	AUTO	
Exposure	0018,1152	IS		ANAP	AUTO	
Exposure in µAs	0018,1153	IS		ANAP	AUTO	
Image and Fluoroscopy Area Dose Product	0018,115E	DS		ANAP	AUTO	
Relative X-Ray Exposure	0018,1405	IS		ANAP	AUTO	
Exposure Index	0018,1411	DS		ANAP	AUTO	
Filter Material	0018,7050	CS		ANAP	AUTO	
Exposure Time in µS	0018,8150	DS		ANAP	AUTO	
Entrance Dose	0040,0302	US		ANAP	AUTO	
Comments on Radiation Dose	0040,0310	ST		ANAP	AUTO	
Entrance Dose in mGy	0040,8302	DS		ANAP	AUTO	

Table 136: X-Ray Generation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		ANAP	AUTO	
Exposure Time	0018,1150	IS		ANAP	AUTO	
Exposure	0018,1152	IS		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Exposure in µAs	0018,1153	IS		ANAP	AUTO	
Exposure Time in µS	0018,8150	DS		ANAP	AUTO	

Table 137: X-Ray Filtration Module Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Filter Material	0018,7050	CS		ANAP	AUTO	

Table 138: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	6000,0010	US		ALWAYS	AUTO	
Overlay Columns	6000,0011	US		ALWAYS	AUTO	
Overlay Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Origin	6000,0050	SS		ALWAYS	AUTO	
Overlay Bits Allocated	6000,0100	US		ALWAYS	AUTO	
Overlay Bit Position	6000,0102	US		ALWAYS	AUTO	
Overlay Data	6000,3000	OW		ALWAYS	AUTO	

Table 139: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ANAP	AUTO	
Window Width	0028,1051	DS		ANAP	AUTO	
VOI LUT Function	0028,1056	CS		ANAP	AUTO	

Table 140: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO	

Table 141: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.4 Secondary Capture Image Storage SOP Class

Table 142: SOP Class Modules

Information Entity	Module	Presence
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	SC Equipment Module	ALWAYS
	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	Modality LUT Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 143: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	MWL, USER	
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	
Issuer of Patient ID	0010,0021	LO		ANAP	MWL, USER	
Patient's Birth Date	0010,0030	DA		VNAP	MWL, USER	
Patient's Sex	0010,0040	CS	F, M, O	VNAP	MWL, USER	
Ethinic Group	0010,2160	SH		ANAP	MWL, USER	
Patient Comments	0010,4000	LT		ANAP	MWL, USER	

Table 144: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	
Study Description	0008,1030	LO		ANAP	MWL, USER	
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
Referenced Study Sequence	0008,1110	SQ		ANAP	EMPTY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Requesting Service	0032,1033	LO		ANAP	MWL, USER	

Table 145: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patients Age	0010,1010	AS		ANAP	MWL, AUTO	
Patient's Size	0010,1020	DS		ANAP	MWL, AUTO	
Patient's Weight	0010,1030	DS		ANAP	MWL, AUTO	
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	
Allergies	0010,2110	LO		ANAP	MWL, USER	
Additional Patient History	0010,21B0	LT		ANAP	MWL, AUTO	
Pregnancy Status	0010,21C0	US		ANAP	MWL, USER	
Patient State	0038,0500	LO		ANAP	MWL, USER	

Table 146: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP	MPPS, USER	
Performing Physicians' Name	0008,1050	PN		ANAP	MPPS, USER	
Operators' Name	0008,1070	PN		ALWAYS	MPPS, USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Body Part Examined	0018,0015	CS		VNAP	MPPS, USER	
Protocol Name	0018,1030	LO		ALWAYS	MWL, USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO, MPPS	
Series Number	0020,0011	IS		ALWAYS	AUTO, MPPS	
Laterality	0020,0060	CS		ANAP	CONFIG	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO, MPPS	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO, MPPS	
Performed Procedure Step	0040,0250	DA		ANAP	MPPS, AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
End Date						
Performed Procedure Step End Time	0040,0251	TM		ANAP	MPPS, AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO, MPPS	
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO, MPPS	
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	MWL	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	USER	

Table 147: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		ALWAYS	CONFIG	
Institution Address	0008,0081	ST		ALWAYS	CONFIG	
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Institutional Department Name	0008,1040	LO		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO	DigitalDiagnost C50	ALWAYS	FIXED	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ANAP	CONFIG	
Software Versions	0018,1020	LO	1.1.4	ALWAYS	FIXED	
Spatial Resolution	0018,1050	DS		ALWAYS	AUTO	

Table 148: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Conversion Type	0008,0064	CS		ALWAYS	AUTO	

Table 149: General Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	AUTO	
Acquisition DateTime	0018,5101	CS		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ALWAYS	AUTO	
Irradiation Event UID	0008,3010	UI		ANAP	AUTO	
Acquisition Number	0020,0012	IS		ANAP	AUTO	
Images in Acquisition	0020,1002	IS		ANAP	AUTO	

Table 150: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: ORIGINAL, Value 2: PRIMARY	ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		ANAP	USER	
Quality Control Image	0028,0300	CS		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	

Table 151: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Stored	0028,0101	US	10, 12, 15	ALWAYS	CONFIG	When Parameter “Increase virtual depth for PACS” is enabled values are : 16,13,11
High Bit	0028,0102	US	9, 11, 14	ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ANAP	AUTO	

Table 152: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ANAP	AUTO	

Table 153: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ANAP	AUTO	
Rescale Slope	0028,1053	DS		ANAP	AUTO	
Rescale Type	0028,1054	LO		ANAP	AUTO	

Table 154: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 155: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.5 X-Ray Radiation Dose SR SOP Class

Table 156: SOP Class Modules

Information Entity	Module	Presence
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	SR Document Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	Enhanced General Equipment Module	ALWAYS
Image	SR Document General Module	ALWAYS
	SR Document Content Module	ALWAYS
	SOP Common Module	ALWAYS

Table 157: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	MWL, USER	
Patient ID	0010,0020	LO		VNAP	MWL, AUTO	
Issuer of Patient ID	0010,0021	LO		ANAP	MWL, USER	
Patient's Birth Date	0010,0030	DA		VNAP	MWL, USER	
Patient's Sex	0010,0040	CS		VNAP	MWL, USER	
Ethnic Group	0010,2160	SH		ANAP	MWL, USER	
Patient Comments	0010,4000	LT		ANAP	AUTO	

Table 158: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	
Study Description	0008,1030	LO		ANAP	MWL, USER	
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0101	SH		ALWAYS	MWL	
> Code Meaning	0008,0104	LO		ALWAYS	MWL	
Referenced Study Sequence	0008,1110	SQ		ANAP	EMPTY	
Study Instance UID	0020,000D	UI		ALWAYS	MWL, AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study ID	0020,0010	SH		VNAP	MWL, AUTO	
Requesting Service	0032,1033	LO		VNAP	MWL, USER	

Table 159: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	MWL, USER	
Patient's Size	0010,1020	DS		ANAP	MWL, USER	
Patient'sWeight	0010,1030	DS		ANAP	MWL, USER	
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	
Allergies	0010,2110	LO		ANAP	MWL, USER	
Occupation	0010,2180	SH		ANAP	MWL, USER	
Additional Patient History	0010,21B0	LT		ANAP	MWL, USER	
Pregnancy Status	0010,21C0	US		ANAP	MWL, USER	
Patient State	0038,0500	LO		ANAP	MWL, USER	

Table 160: SR Document Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		VNAP	AUTO	
>Referenced SOP Class UID	0008,1150	Ui		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MPPS, USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	

Table 161: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		ANAP	CONFIG	
Institution Address	0008,0081	ST		ANAP	CONFIG	
Station Name	0008,1010	SH		ANAP	CONFIG	
Institutional Department	0008,1040	LO		ANAP	CONFIG	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Name						
Manufacturer's Model Name	0008,1090	LO	DigitalDiagnost C50	ALWAYS	FIXED	
Device Serial Number	0018,1000	LO		ANAP	CONFIG	
Software Versions	0018,1020	LO	1.1.4	ALWAYS	FIXED	
Spatial Resolution	0018,1050	DS		ANAP	AUTO	

Table 162: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Manufacturer's Model Name	0008,1090	LO	DigitalDiagnost C50	ALWAYS	FIXED	
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	
Software Version(s)	0008,1020	LO	1.1.4	ALWAYS	AUTO	

Table 163: SR Document General Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Referenced Request Sequence	0040,A370	SQ		ALWAYS	AUTO	
> Accession Number	0008,0050	SH		VNAP	AUTO	
> Referenced Study Sequence	0008,1110	SQ		VNAP	EMPTY	
> Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
> Requested Procedure Description	0032,1060	LO		VNAP	AUTO	
> Requested Procedure Code Sequence	0032,1064	SQ		VNAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0101	SH		ALWAYS	MWL	
> Code Meaning	0008,0104	LO		ALWAYS	MWL	
> Requested Procedure ID	0040,1001	SH		VNAP	AUTO	
> Placer Order Number/Imaging Service Request	0040,2016	LO		VNAP	AUTO	
> Filler Order	0040,2017	LO		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number/Imaging Service Request						
Performed Procedure Code Sequence	0040,A372	SQ		VNAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0101	SH		ALWAYS	MWL	
> Code Meaning	0008,0104	LO		ALWAYS	MWL	
Completion Flag	0040,A491	CS		ALWAYS	AUTO	
Completion Flag Description	0040,A492	LO		ANAP	AUTO	
Verification Flag	0040,A493	CS		ALWAYS	AUTO	

Table 164: SR Document Content Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Value Type	0040,A040	CS	CONTAINER	ALWAYS	FIXED	
Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	
> Code Value	0008,0100	SH		ALWAYS	AUTO	
> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
> Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Continuity of Content	0040,A050	CS		ALWAYS	AUTO	
Content Template Sequence	0040,A504	SQ		ALWAYS	AUTO	
>Mapping Resource	0008,0105	CS	DCMR	ALWAYS	FIXED	
>Template Identifier	0040,DB00	CS	10001	ALWAYS	FIXED	
Content Sequence	0040,A730	SQ		ALWAYS	AUTO	
>Relationship Type	0040,A010	CS		ALWAYS	AUTO	
>Value Type	0040,A040	CS		ALWAYS	AUTO	
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Concept Code Sequence	0040,A168	SQ		ANAP	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	

Table 165: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	COPY	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.88.67	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.2. Usage of Attributes from Received IOD

The DigitalDiagnost C50 has only an export side. The modality cannot read/view images from a CD or by import.

8.1.3. Attribute Mapping

Table 166: Attribute mapping during Modality Workflow

Name	WLM Tag	MPPS CREATE Tag	MPPS SET Tag	Image IOD Tag
Accession Number	0008,0050	0008,0050	-	0008,0050
Modality	-	0008,0060	-	0008,0060
Referring Physician's Name	0008,0090	-	-	0008,0090
Operators' Name	-	-	0008,1070	0008,1070
Referenced Study Sequence	0008,1110	0008,1110	-	0008,1110
Referenced Image Sequence	-	-	0008,1140	-
> Referenced SOP Class UID SOP Class UID	-	-	0008,1150	0008,0016
> Referenced SOP Instance UID SOP Instance UID	-	-	0008,1155	0008,0018
Patient's Name	0010,0010	0010,0010	-	0010,0010
Patient ID	0010,0020	0010,0020	-	0010,0020
Issuer of Patient ID	0010,0021	0010,0021	-	0010,0021
Patient's Birth Date	0010,0030	0010,0030	-	0010,0030
Patient's Sex	0010,0040	0010,0040	-	0010,0040
Other Patient IDs	0010,1000	0010,1000	-	0010,1000
Medical Alerts	0010,2000	-	-	0010,2000
Allergies	0010,2110	-	-	0010,2110
Ethnic group	0010,2160	-	-	0010,2160
Additional Patient History	0010,21B0	-	-	0010,21B0
Pregnancy Status	0010,21C0	-	-	0010,21C0
Patient Comments	0010,4000	-	-	0010,4000
Protocol Name	-	-	0018,1030	0018,1030
Study Instance UID	0020,000D	0020,000D	-	0020,000D
Series Instance UID			0020,000E	0020,000E
Study ID	-	0020,0010	-	0020,0010

Name	WLM Tag	MPPS CREATE Tag	MPPS SET Tag	Image IOD Tag
Requesting Service	0032,1033	-	-	0032,1033
Requested Procedure Description	0032,1060	0032,1060	-	-
Requested Procedure Code Sequence3	0032,1064	0008,1032	0008,1032	0008,1032
Performed Procedure Code Sequence				
Special Needs	0038,0050	-	-	0038,0050
Patient State	0038,0500	-	-	0038,0500
Scheduled Procedure Step Description4	0040,0007	0040,0007	-	0040,0007
Performed Procedure Step Description		0040,0254	-	0040,0254
Special Needs	0038,0050	-	-	0038,0050
Patient State	0038,0500	-	-	0038,0500
Scheduled Protocol Code Sequence4	0040,0008	0040,0260	0040,0260	0040,0008
Performed Protocol Code Sequence				0040,0260
Scheduled Procedure Step ID	0040,0009	0040,0009	-	0040,0009
Performed Procedure Step Start Date	-	0040,0244	-	0040,0244
Performed Procedure Step Start Time	-	0040,0245	-	0040,0245
Performed Procedure Step ID	-	0040,0253	-	0040,0253
Requested Procedure ID	0040,1001	0040,1001	-	0040,1001

8.1.4. Coerced/Modified fields

Not Applicable. Coerced/Modified fields are not implemented by the product.

8.2. Data Dictionary of Private Attributes

Please refer section 8.5.

8.3. Coded Terminology and Templates

Not Applicable. Private Coded Terminology and templates are not implemented by the product.

8.3.1. Context Groups

Not Applicable. Private Contect Groups are not implemented by the product.

8.3.2. Template Specifications

DigitalDiagnost C50 can optionally create and stores, upon completion of the study, a DICOM X-Ray Radiation DOSE SR object.

8.3.2.1. X-RAY RADIATION DOSE SR IOD TEMPLATES

The DigitalDiagnost C50 can create and store, upon completion of the study, a DICOM X-Ray Radiation DOSE SR object. The templates that comprise the X-Ray Radiation Dose SR are interconnected as indicated in the figure below:

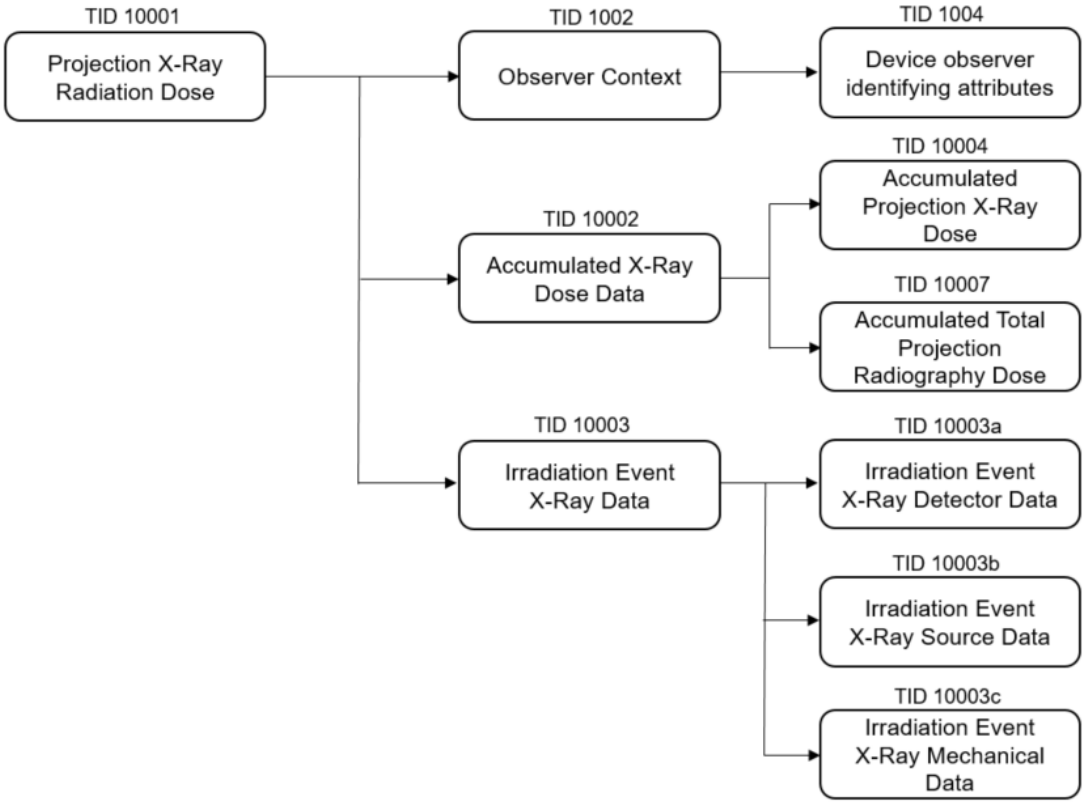

Figure 18: X-Ray Radiation Dose SR IOD Template Structure

This section describes the content of all the templates used in the X-Ray Radiation Dose Reporting SR.

Table 167: Used Templates for X-Ray Radiation Dose Reporting

Template Name	Template ID
Projection X-Ray Radiation Dose	TID 10001
Accumulated X-Ray Dose	TID 10002
Irradiation Event X-Ray Data	TID 10003
Irradiation Event X-Ray Detector Data	TID 10003A
Irradiation Event X-Ray Source Data	TID 10003B
Irradiation Event X-Ray Mechanical Data	TID 10003C
Accumulated Projection X-Ray Dose	TID 10004
Accumulated Total Projection Radiography Dose	TID 10007
Observer Context	TID 1002
Device Observer Identifying Attributes	TID 1004

8.3.2.1.1 TID 10001 Projection X-Ray Radiation Dose

Table 168: Projection X-Ray Radiation Dose

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
		EV (113701, DCM, "X-Ray Radiation Dose Report")		1	ALWAYS	

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>	HAS CONCEPT MOD	EV (121058, DCM, "Procedure reported")	CODE	1	ALWAYS	(113704, DCM, "Projection X-Ray")
>>	HAS CONCEPT MOD	EV (G-C0E8, SRT, "Has Intent")	CODE	1	ALWAYS	(R-408C3, SRT, "Diagnostic Intent")
>		DTID 1002 "Observer Context"	INCLUDE	1	ALWAYS	
>	HAS OBS CONTEXT	EV (113705, DCM, "Scope of Accumulation")	CODE	1	ALWAYS	(113016, DCM, "Performed Procedure Step")
>>	HAS PROPERTIES	DCID 10001 "UID Types"	UIDREF	1	ALWAYS	(121126, DCM, Performed Procedure Step SOP Instance UID)
>	CONTAINS	EV (113945, DCM, "X-Ray Detector Data Available")	CODE	1	ALWAYS	(R-0038D, SRT, "Yes")
>	CONTAINS	EV (113943, DCM, "X-Ray Source Data Available")	CODE	1	ALWAYS	(R-0038D, SRT, "Yes")
>	CONTAINS	EV (113944, DCM, "X-Ray Mechanical Data Available")	CODE	1	ALWAYS	(R-00389, SRT, "Yes")
>	CONTAINS	DTID 10002 "Accumulated X-Ray Dose"	INCLUDE	1	ALWAYS	
>	CONTAINS	DTID 10003 "Irradiation Event X-Ray Data"	INCLUDE	1-n	ALWAYS	
>	CONTAINS	EV (121106, DCM, "Comment")	TEXT	1	CONDITIONAL	X-Ray Radiation Dose Structured Report related to the Performed Procedure Step
>	CONTAINS	EV (113854, DCM, "Source of Dose Information")	CODE	1	ALWAYS	(113856, DCM, "Automated Data Collection")

8.3.2.1.2 TID 10002 Accumulated X-Ray Dose

Table 169: Accumulated X-Ray Dose

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>		EV (113702, DCM, "Accumulated X-Ray Dose Data")	CONTAINER	1	ALWAYS	
>>	HAS CONCEPT MOD	EV (113764, DCM, "Acquisition Plane")	CODE	1	ALWAYS	(113622, DCM, "Single Plane")

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>>	CONTAINS	DTID 10004 “Accumulated Projection X-Ray Dose”	INCLUDE	1	ALWAYS	
>>	CONTAINS	DTID 10007 “Accumulated Total Projection Radiography Dose”	INCLUDE	1	ALWAYS	TID (10001) Row 2 = (113704, DCM, "Projection X-Ray") AND TID (10001) Row 4 is absent

8.3.2.1.3 TID 10003 Irradiation Event X-Ray Data

Table 170: Irradiation Event X-Ray Data

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>		EV (113706, DCM, "Irradiation Event X-Ray Data")	CONTAINER	1	ALWAYS	
>>	HAS CONCEPT MOD	EV (113764, DCM, "Acquisition Plane")	CODE	1	ALWAYS	(113622, DCM, "Single Plane)
>>	CONTAINS	EV (113769, DCM, "Irradiation Event UID")	UIDREF	1	ALWAYS	
>>	CONTAINS	DT (111526, DCM, "DateTime Started")	DATETIME	1	ALWAYS	
>>	CONTAINS	EV (113721, DCM, "Irradiation Event Type")	CODE	1	ALWAYS	(113611, DCM, "Stationary Acquisition")
>>	CONTAINS	EV (125203, DCM, "Acquisition Protocol")	TEXT	1	CONDITIONAL	
>>	CONTAINS	EV (123014, DCM, "Target Region")	CODE	1	ALWAYS	Value from CID 4031 “Common Anatomic Regions”
>>>	HAS CONCEPT MOD	EV (G-C171, SRT, "Laterality")	CODE	1	CONDITIONAL	Value from CID 244 “Laterality”
>>	CONTAINS	EV (122130, DCM, "Dose Area Product")	NUM	1	ALWAYS	Units: (Gy.m2, UCUM, "Gy.m2")
>>	CONTAINS	EV (113780, DCM, "Reference Point Definition")	CODE	1	ALWAYS	30cm above Tabletop and 30cm in Front of Image Input Surface
>>	CONTAINS	DTID 10003A “Irradiation Event X-Ray Detector Data”	INCLUDE	1	CONDITIONAL	IFF TID 10001 Row 8 has a value of (373066001, SCT, "Yes") or (R-0038D, SRT, "Yes")
>>	CONTAINS	DTID 10003B “Irradiation Event X-Ray Source Data”	INCLUDE	1	CONDITIONAL	IFF TID 10001 Row 9 has a value of (373066001, SCT, "Yes") or (R-0038D, SRT, "Yes")

>>	CONTAINS	DTID 10003C “Irradiation Event X-Ray Mechanical Data”	INCLUDE	1	CONDITIONAL	IFF TID 10001 Row 10 is absent or has a value of (373066001, SCT, "Yes")

8.3.2.1.4 TID 10003A Irradiation Event X-Ray Detector Data

Table 171: Irradiation Event X-Ray Detector Data

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
	CONTAINS	EV (113845, DCM, "Exposure Index")	NUM	1	CONDITIONAL	Units: (1, UCUM, "no units")
>	CONTAINS	EV (113795, DCM, "Acquired Image")	IMAGE	1-n	CONDITIONAL	

8.3.2.1.5 TID 10003B Irradiation Event X-Ray Source Data

Table 172: Irradiation Event X-Ray Source Data

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>>	CONTAINS	EV (113738, DCM, "Dose (RP)")	NUM	1	CONDITIONAL	Units: (Gy, UCUM, "Gy")
>>	CONTAINS	EV (113780, DCM, "Reference Point Definition")	CODE	1	CONDITIONAL	
>>	CONTAINS	EV (113768, DCM, "Number of Pulses")	NUM	1	CONDITIONAL	Units: (1, UCUM, "no units")
>>	CONTAINS	EV (113742, DCM, "Irradiation Duration")	NUM	1	CONDITIONAL	Units: (s, UCUM, "s")
>>	CONTAINS	EV (113733, DCM, "KVP")	NUM	1-n	ALWAYS	Units: (kV, UCUM, "kV")
>>	CONTAINS	EV (113734, DCM, "X-Ray Tube Current")	NUM	1-n	ALWAYS	Units: (mA, UCUM, "mA")
>>	CONTAINS	EV (113736, DCM, "Exposure")		1-n	CONDITIONAL	Units: (uA.s, UCUM, "uA.s")
>>	CONTAINS	EV (111632, DCM, "Anode Target Material")	CODE	1	CONDITIONAL	(C-164F9, SRT, "Tungsten or Tungsten compound")

8.3.2.1.6 TID 10003C Irradiation Event X-Ray Mechanical Data

Table 173: Irradiation Event X-Ray Source Data

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>	CONTAINS	DCID 10008 “Dose Related Distance Measurement	NUM	1-n	CONDITIONAL	Units: (mm, UCUM, "mm")

8.3.2.1.7 TID 10004 Accumulated Projection X-Ray Dose

Table 174: Accumulated Projection X-Ray Dose

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>>	CONTAINS	EV (113727, DCM, "Acquisition Dose Area Product Total)	NUM	1	ALWAYS	Units: (Gy.m2, UCUM, "Gy.m2")
>>	CONTAINS	EV (113729, DCM, "Acquisition Dose (RP) Total")	NUM	1	ALWAYS	Units: (Gy, UCUM, "Gy")
>>	CONTAINS	EV (113855, DCM, “Total Acquisition Time”)	NUM	1	ALWAYS	Units: (s, UCUM, "s")

8.3.2.1.8 TID 10007 Accumulated Total Projection Radiography Dose

Table 175: Accumulated Total Projection Radiography Dose

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>>	CONTAINS	EV (113722, DCM, "Dose Area Product Total")	NUM	1	ALWAYS	Units: (Gy.m2, UCUM, "Gy.m2")
>>	CONTAINS	EV (113725, DCM, "Dose (RP) Total")	NUM	1	CONDITIONAL	Units: (Gy, UCUM, "Gy")
>>	CONTAINS	EV (113731, DCM, “Total Number of Radiographic Frames”)	NUM	1	CONDITIONAL	Units: (1, UCUM, no units)
>>	CONTAINS	EV (113780, DCM, “Reference Point Definition”)	TEXT	1	CONDITIONAL	30cm above Tabletop and 30cm in Front of Image Input Surface

8.3.2.1.9 TID 1002 Observer Context

Table 176: Observer Context

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>	HAS OBS CONTEXT	EV (121005, DCM, "Observer Type")	CODE	1	CONDITIONAL	(121007, DCM, "Device")
>	HAS OBS CONTEXT	DTID 1004 “Device Observer Identifying Attributes”	INCLUDE	1	ALWAYS	

8.3.2.1.10 TID 1004 Device Observer Identifying Attributes

Table 177: Device Observer Identifying Attributes

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>	HAS OBS CONTEXT	EV (121012, DCM, “Device Observer UID”)	UIDREF	1	ALWAYS	

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
>	HAS OBS CONTEXT	EV (121013, DCM, “Device Observer Name”)	TEXT	1	ALWAYS	Station Name (0008,1010)
>	HAS OBS CONTEXT	EV (121014, DCM, “Device Observer Manufacturer”)	TEXT	1	ALWAYS	Manufacturer (0008,0070): Philips
>	HAS OBS CONTEXT	EV (121015, DCM, “Device Observer Model Name”)	TEXT	1	ALWAYS	Manufacturer’s Model Name (0008,1090): DigitalDiagnost C50
>	HAS OBS CONTEXT	EV (121016, DCM, “Device Observer Serial Number”)	TEXT	1	ALWAYS	Device Serial Number (0018,1000)

8.3.3. Private code definitions

Not Applicable. Private code definitions are not implemented by the product.

8.4. Grayscale Image consistency

The monitor of DigitalDiagnost C50 system can be calibrated according Grayscale Display Function Standard.

The pixel values exported and printed should be interpreted as P-Value. If the export destination or the printer does not support GSDF, DigitalDiagnost C50 provides calibration tools to adapt to this device to afford grayscale image consistency. The calibration takes into account ambient luminance and light box luminance.

8.5. Standard Extended/Specialized/Private SOPs

Table 178: List of created SOP Classes

SOP Class Name	SOP Class UID
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage - For Presentation. SOP	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing. SOP	1.2.840.10008.5.1.4.1.1.1.1.1
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67

8.5.1. Standard Extended/Specialized/Private SOP Instance

The Storage SOP classes are extended to create a standard extended SOP class by addition of standard and private attributes to the created SOP Instances.

8.5.1.1. Computed Radiography Image Storage SOP Class

Table 179: Addition of standard and private attributes for Computed Radiography Image Storage SOP Class

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Image and Fluoroscopy Area Dose Product	0018,115E	DS		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Grid	0018,1166	CS		ANAP	AUTO	
Filter Material	0018,7050	CS		VNAP	AUTO	
Requesting Physician	0032,1032	PN		VNAP	MWL, USER	
Requested Procedure Description	0032,1060	LO		VNAP	MWL, USER	
Requested Procedure Code Sequence	0032,1064	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ANAP	AUTO	
> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Code Meaning	0008,0104	UL		ANAP	AUTO	
Special Needs	0038,0050	LO		VNAP	MWL, USER	
Performed Station AE Title	0040,0241	AE		VNAP	MPPS, AUTO	
Performed Procedure Step Status	0040,0252	CS		VNAP	MPPS, AUTO	
Total Number of Exposures	0040,0301	US		VNAP	AUTO	
Comments on Radiation Dose	0040,0310	ST		ANAP	USER	
Billing Procedure Step Sequence	0040,0320	SQ		ANAP	AUTO	
Film Consumption Sequence	0040,0321	SQ		VNAP	AUTO	
Requested Procedure ID	0040,1001	SH		VNAP	MWL, USER	
Reason for the Requested Procedure	0040,1002	LO		VNAP	MWL, USER	
Requested Procedure Priority	0040,1003	SH		VNAP	MWL, USER	
Patient Transport Arrangements	0040,1004	LO		VNAP	MWL, USER	
Names of Intended Recipients of Results	0040,1010	PN		VNAP	MWL, USER	
Requested Procedure Comments	0040,1400	LT		VNAP	MWL, USER	
Reason for the Imaging Service Request (RETIRED)	0040,2001	LO		VNAP	MWL	
Issue Date of Imaging Service Request	0040,2004	DA		VNAP	MWL, USER	
Imaging Service	0040,2400	LT		VNAP	MWL, USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Request Comments						
Exposure Dose Sequence	0040,030E	SQ		VNAP	AUTO	

8.5.1.2. Secondary Capture Image Storage SOP Class

Table 180: Addition of standard and private attributes for Secondary Capture Image Storage SOP Class

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Contrast/Bolus Agent	0018,0010	LO		ANAP	AUTO	
KVP	0018,0060	DS		ANAP	AUTO	
Distance Source to Detector	0018,1110	DS		ANAP	AUTO	
Distance Source to Patient	0018,1111	DS		ANAP	AUTO	
Exposure Time	0018,1150	IS		ANAP	AUTO	
Exposure	0018,1152	IS		ANAP	AUTO	
Exposure in uAs	0018,1153	IS		ANAP	AUTO	
Image and Fluoroscopy Area Dose Product	0018,115E	DS		VNAP	AUTO	
Grid	0018,1166	CS		ANAP	AUTO	
Imager Pixel Spacing	0018,1164	DS		VNAP	AUTO	
Acquisition Device Processing Description	0018,1400	LO		VNAP	AUTO	
Relative X-ray Exposure	0018,1405	IS		VNAP	AUTO	
Exposure Index	0018,1411	DS		ANAP	AUTO	
View Position	0018,5101	CS		VNAP	AUTO	
Filter Material	0018,7050	CS		VNAP	AUTO	
Requesting Physician	0032,1032	PN		VNAP	MWL, USER	
Requested Procedure Description	0032,1060	LO		VNAP	MWL, USER	
Requested Procedure Code Sequence	0032,1064	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ANAP	AUTO	
> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Code Meaning	0008,0104	UL		ANAP	AUTO	
Special Needs	0038,0050	LO		VNAP	MWL, USER	
Performed Station AE Title	0040,0241	AE		VNAP	MPPS, AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Performed Procedure Step Status	0040,0252	CS		VNAP	MPPS, AUTO	
Total Number of Exposures	0040,0301	US		VNAP	AUTO	
Entrance Dose	0040,0302	US		VNAP	AUTO	
Comments on Radiation Dose	0040,0310	ST		ANAP	AUTO	
Billing Procedure Step Sequence	0040,0320	SQ		ANAP	AUTO	
Film Consumption Sequence	0040,0321	SQ		VNAP	AUTO	
Requested Procedure ID	0040,1001	SH		VNAP	MWL, USER	
Reason for the Requested Procedure	0040,1002	LO		VNAP	MWL, USER	
Requested Procedure Priority	0040,1003	SH		VNAP	MWL, USER	
Patient Transport Arrangements	0040,1004	LO		VNAP	MWL, USER	
Names of Intended Recipients of Results	0040,1010	PN		VNAP	AUTO	
Requested Procedure Comments	0040,1400	LT		VNAP	MWL	
Reason for the Imaging Service Request (RETIRED)	0040,2001	LO		VNAP	MWL	
Issue Date of Imaging Service Request	0040,2004	DA		VNAP	MWL, USER	
Imaging Service Request Comments	0040,2400	LT		VNAP	MWL, USER	
Entrance Dose in mGy	0040,8302	DS		ANAP	AUTO	
Exposure Dose Sequence	0040,030E	SQ		VNAP	AUTO	

8.5.1.3. Digital X-Ray Image Storage - For Pres. SOP Class

Table 181: Addition of standard and private attributes for Digital X-Ray Image Storage - For Pres. SOP Class

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Requesting Physician	0032,1032	PN		VNAP	MWL, USER	
Requested Procedure	0032,1060	LO		VNAP	MWL, USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Description						
Requested Procedure Code Sequence	0032,1064	SQ		ANAP	MWL, USER	
>Code Value	0008,0100	SH		ANAP	AUTO	
> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Code Meaning	0008,0104	UL		ANAP	AUTO	
Special Needs	0038,0050	LO		VNAP	MWL, USER	
Performed Station AE Title	0040,0241	AE		VNAP	MPPS, AUTO	
Performed Procedure Step Status	0040,0252	CS		VNAP	MPPS, AUTO	
Total Number of Exposures	0040,0301	US		VNAP	AUTO	
Billing Procedure Step Sequence	0040,0320	SQ		ANAP	AUTO	
Film Consumption Sequence	0040,0321	SQ		VNAP	AUTO	
Requested Procedure ID	0040,1001	SH		VNAP	MWL, AUTO	
Reason for the Requested Procedure	0040,1002	LO		ANAP	AUTO	
Requested Procedure Priority	0040,1003	SH		VNAP	MWL	
Patient Transport Arrangements	0040,1004	LO		VNAP	MWL, USER	
Names of Intended Recipients of Results	0040,1010	PN		VNAP	AUTO	
Requested Procedure Comments	0040,1400	LT		VNAP	MWL	
Reason for the Imaging Service Request	0040,2001	LO		VNAP	MWL	
Issue Date of Imaging Service Request	0040,2004	DA		VNAP	MWL, USER	
Imaging Service Request Comments	0040,2400	LT		VNAP	MWL, USER	
Exposure Dose Sequence	0040,030E	SQ		ANAP	AUTO	

8.5.1.4. Digital X-Ray Image Storage - For Proc. SOP Class

Table 182: Addition of standard and private attributes for Digital X-Ray Image Storage - For Proc. SOP Class

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Requesting Physician	0032,1032	PN		VNAP	MWL, USER	
Requested Procedure Description	0032,1060	LO		VNAP	MWL, USER	
Requested Procedure Code Sequence	0032,1064	SQ		ANAP	MWL, USER	
>Code Value	0008,0100	SH		ANAP	AUTO	
> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Code Meaning	0008,0104	UL		ANAP	AUTO	
Special Needs	0038,0050	LO		VNAP	MWL, USER	
Performed Station AE Title	0040,0241	AE		VNAP	MPPS, AUTO	
Performed Procedure Step Status	0040,0252	CS		VNAP	MPPS, AUTO	
Total Number of Exposures	0040,0301	US		VNAP	AUTO	
Billing Procedure Step Sequence	0040,0320	SQ		ANAP	AUTO	
Film Consumption Sequence	0040,0321	SQ		VNAP	AUTO	
Requested Procedure ID	0040,1001	SH		VNAP	MWL, AUTO	
Reason for the Requested Procedure	0040,1002	LO		ANAP	AUTO	
Requested Procedure Priority	0040,1003	SH		VNAP	MWL	
Patient Transport Arrangements	0040,1004	LO		VNAP	MWL, USER	
Names of Intended Recipients of Results	0040,1010	PN		VNAP	AUTO	
Requested Procedure Comments	0040,1400	LT		VNAP	MWL	
Reason for the Imaging Service Request	0040,2001	LO		VNAP	MWL	
Issue Date of Imaging Service Request	0040,2004	DA		VNAP	MWL, USER	
Imaging Service Request Comments	0040,2400	LT		VNAP	MWL, USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Exposure Dose Sequence	0040,030E	SQ		ANAP	AUTO	

8.5.1.5. X-Ray Radiation Dose SR SOP Class

Table 183: Addition of standard and private attributes for X-Ray Radiation Dose SR Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
Performing Physician's Name	0008,1050	PN		ANAP	MWL, AUTO, USER	
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Image and Fluoroscopy Area Dose Product	0018,115E	DS		ANAP	MWL, AUTO, USER	
Requesting Physician	0032,1032	PN		ANAP	MWL, AUTO, USER	
Requested Procedure Description	0032,1060	LO		ANAP	MWL, AUTO, USER	
Requested Procedure Code Sequence	0032,1064	SQ		ANAP	MWL, USER	
>Code Value	0008,0100	SH		ANAP	AUTO	
> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Code Meaning	0008,0104	UL		ANAP	AUTO	
Special Needs	0038,0050	LO		ANAP	MWL, AUTO, USER	
Performed Station AE Title	0040,0241	AE		ANAP	MWL, AUTO, USER	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	MWL, AUTO, USER	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	MWL, AUTO, USER	
Performed Procedure End Date	0040,0250	DA		ANAP	MWL, AUTO, USER	
Performed Procedure End Time	0040,0251	TM		ANAP	MWL, AUTO, USER	
Performed Procedure Step Status	0040,0252	CS		ANAP	MWL, AUTO, USER	
Performed Procedure Step ID	0040,0253	SH		ANAP	MWL, AUTO, USER	
Performed Procedure	0040,0254	LO		ANAP	MWL, AUTO,	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Step Description					USER	
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	MWL, AUTO, USER	
>Code Value	0008,0100	SH		ALWAYS	MWL, AUTO, USER	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL, AUTO, USER	
>Code Meaning	0008,0104	LO		ALWAYS	MWL, AUTO, USER	
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	MWL, AUTO, USER	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL, AUTO, USER	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL, AUTO, USER	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	AUTO	
>Requested Procedure ID	0040,1001	SH		ANAP	AUTO	
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO	
Total Time of Fluoroscopy	0040,0300	US		ANAP	MWL, AUTO, USER	
Total Number of Exposures	0040,0301	US		ANAP	MWL, AUTO, USER	
Entrance Dose	0040,0302	US		ANAP	MWL, AUTO, USER	
Exposure Dose Sequence	0040,030E	SQ		ANAP	MWL, AUTO, USER	
Comments on Radiation Dose	0040,0310	ST		ANAP	AUTO	
Billing Procedure Step Sequence	0040,0320	SQ		ANAP	AUTO	
Film Consumption Sequence	0040,0321	SQ		ANAP	MWL, AUTO, USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requested Procedure ID	0040,1001	LO		VNAP	MWL, AUTO, USER	
Reason for the Requested Procedure	0040,1002	LO		VNAP	MWL, AUTO, USER	
Requested Procedure Priority	0040,1003	SH		VNAP	MWL, AUTO, USER	
Patient Transport Arrangements	0040,1004	LO		VNAP	MWL, AUTO, USER	
Names of Intended Recipients of Results	0040,1010	PN		VNAP	MWL, AUTO, USER	
Requested Procedure Comments	0040,1400	LT		ANAP	MWL, AUTO, USER	
Reason for the Imaging Service Request	0040,2001	LO		ANAP	MWL, AUTO, USER	
Issue Date of Imaging Service Request	0040,2004	DA		ANAP	MWL, AUTO, USER	
Imaging Service Request Comments	0040,2400	LT		ANAP	MWL, AUTO, USER	
Entrance Dose in mGy	0040,8302	DS		ANAP	AUTO	
UID	0040,A124	UI		ANAP	MWL, AUTO, USER	
Referenced Request Sequence	0040,A370	SQ		ANAP	MWL, AUTO, USER	
>Accession Number	0008,0050	SH		ANAP	MWL, AUTO, USER	
>Referenced Study Sequence	0008,1110	SQ		ANAP	MWL, AUTO, USER	
>Study Instance UID	0020,000D	UI		ANAP	MWL, AUTO, USER	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL, AUTO, USER	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL, AUTO, USER	
>Placer Order Number / Imaging Service Request	0040,2016	LO		ANAP	MWL, AUTO, USER	
>Filler Order Number / Imaging Service Request	0040,2017	LO		ANAP	MWL, AUTO, USER	
Performed Procedure Code Sequence	0040,A372	SQ		ANAP	MWL, AUTO, USER	
>Code Value	0008,0100	SH		ALWAYS	MWL, AUTO,	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
					USER	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL, AUTO, USER	
>Code Meaning	0008,0104	LO		ALWAYS	MWL, AUTO, USER	

8.6. Private Transfer Syntaxes

Not Applicable. Private Transfer Syntaxes are not implemented by the product.

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