

Philips Medical Systems

DICOM CONFORMANCE STATEMENT

ELEVA DI R1

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## DICOM Conformance Statement

Issued by:  
Philips Medical Systems Nederland B.V.  
Medical Imaging IT, Interoperability

Building QV-282  
P.O. Box 10.000  
5680 DA Best  
The Netherlands

email: [dicom@philips.com](mailto:dicom@philips.com)  
Internet: <http://www.medical.philips.com/>

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## 1 INTRODUCTION

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

### 1.1 Scope and Field of Application

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

The field of application is the integration of the Philips Medical Systems equipment into an environment of medical devices. This Conformance Statement should be read in conjunction with the DICOM standard and its addenda [DICOM].

### 1.2 Intended Audience

This Conformance Statement is intended for:

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

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

### 1.3 Contents and Structure

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

### 1.4 Used Definitions, Terms and Abbreviations

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

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

### 1.5 References

#### 1.5.1 [DICOM] The Digital Imaging and Communications in Medicine

(DICOM) standard (NEMA PS 3.X):  
National Electrical Manufacturers Association (NEMA)  
Publication Sales 1300 N. 17<sup>th</sup> Street, Suite 1847  
Rosslyn, Va. 22209, United States of America

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## 1.6 Important Note to the Reader

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

### Interoperability

Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a 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 assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.

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

### New versions of the DICOM Standard

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

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

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## 1.7 General Acronyms and Abbreviations.

The following acronyms and abbreviations are used in the document.

ACR	American College of Radiology
AE	Application Entity
ANSI	American National Standard Institute
DICOM	Digital Imaging and Communication in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element-Composite
DIMSE-N	DICOM Message Service Element-Normalized
EBE	Explicit VR Big Endian
EEC	ELEVA Examination Control
ELE	Explicit VR Little Endian
GUI	Graphic User Interface
HIS	Hospital Information System
HL7	Health Level Seven
ILE	Implicit VR Little Endian
IOD	Information Object Definition
ISIS	Information System - Imaging System
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
RIS	Radiology Information System
RWA	Real World Activity
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet protocol
UID	Unique Identifier
WLM	Worklist Management

## 2 IMPLEMENTATION MODEL

The Digital Imaging (DI) ELEVA Release 1.1.1 System, later refers to DI ELEVA is a multifunctional X-ray system designed to provide faster, more confident diagnoses. It combines a wide applicational range. The DI ELEVA is a digital fluorography modality. It is part of an X-ray system. The main functions are:

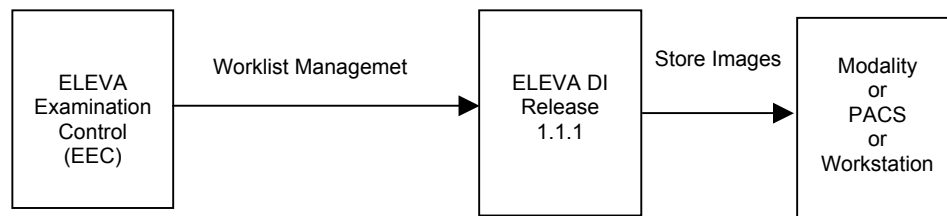
- image acquisition and display
- image review and processing
- image handling, storage and networking,
- administration of patient, physician and examination data.

The main application areas are:

- R/F examinations
- vascular and non-vascular examinations
- angiography and tomography examinations
- interventional procedures

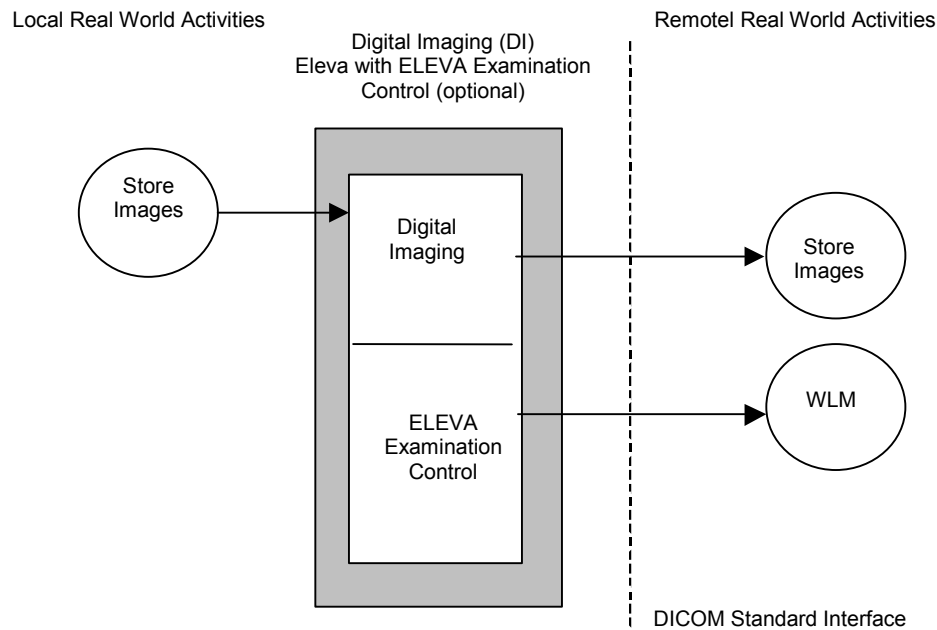
DI ELEVA Release 1.1.1 contains a DICOM Export function (to transfer ELEVA DI image data to a remote system) and optional a ELEVA Examination Control interface (to retrieve an Worklist from Radiology Information System). For the combination of a DI ELEVA R 1.1.1 with an ViewForm Image Workstation (EDI ELEVA) see the EDI ELEVA Release 1.1.1 Conformance Statement.

**Figure 1. ELEVA DI in a DICOM network**



## Application Data Flow Diagram

DI ELEVA behaves as system with two Application Entities (AE's). It's related Implementation Model is shown in Figure 2 on this page. It shows all of the AE's and graphically depicts the relationship of the AE's use of DICOM to Real-World Activities. On the left-hand side, the local Real-World Activities are presented whereas on the right-hand side, the remote Real-World Activities are presented.



**Figure 2. Implementation Model ELEVA DI R 5.2.2**

*As documented in the PS 3.4, the arrows in the diagram have the following meanings:  
An arrow pointing to the right indicates the local application entity initiates an association.  
An arrow pointing to the left indicates the local application entity accepts an association*

## 2.1 Functional Definition of Application Entities

### 2.1.1 Digital Imaging AE

The DI ELEVA DICOM Export acts as SCU to transfers a complete examination to a remote DICOM node. The transfer of a subset of images in an examination is possible. During the DICOM store operation it is possible to perform a cancel operation on the store.

Image data to be transferred are instances of the DICOM X-Ray Radiofluoroscopic (RF), Secondary Capture (SC) classes, or RAW Image Data. The following cases can be distinguished:

The system is configured to support RF, SC, and RAW Image SOP classes. Images are by default sent out as RF. SC will be sent out either, if the receiving site supports only SC or at explicit request from the user.



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The system is configured to support SC class only. All images are exported as SC images. If the SCP system doesn't support RF images, the images are exported as SC images.

## 2.2 Sequencing of Real World Activities

Examinations, identified with a new UID, are created inside the EEC AE as result of worklist management or on manual scheduling by the clinical user. Once an examination (an equivalent to the DICOM Procedure Step) is created, the user can select it at the EEC for acquisition. The administration parameters will be sent from EEC to DI, where also a new Examination is created, having the same UID and parameters. Examination selection for acquisition is synchronized between EEC and DI. Acquired images and related data are added to the examination selected for acquisition.

When the clinical user has explicitly indicated that the examination is finished and /or can be deleted on the system controller (ELEVA Examination Control), this will be communicated to the DI.

After acquisition the DI can then perform an export of the generated images. However, export of DICOM images is also possible without the Worklist and Study Component activities.

Images which are shown as zoomed on the DI will be exported as "normal" (i.e. non-zoomed) images. ELEVA DI annotations on "normal" images are exported as Image Comments. The images are intended for viewing purposes only. The compatibility of image data re-imported of the exported DICOM image data in an earlier stage (e.g. during media exchange), is not defined.

## 3 AE SPECIFICATIONS

ELEVA DI Release 1.1.1 contains two Application Entity.

ELEVA DI AE  
ELEVA EXAMINATION CONTROL AE

### 3.1 ELEVA DI DICOM AE

The ELEVA DI DICOM Application Entity provides Standard Conformance to the following DICOM 3.0 SOP classes as an SCU specified in Table 1.

**Table 1. Supported SOP Classes as SCU by the ELEVA DI DICOM AE**

SOP Class Name	UID
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
RAW Image Data (private)	1.3.46.670589.2.3.1.1

The ELEVA DI DICOM Application Entity does not support DICOM 3.0 SOP classes as a SCP.

#### 3.1.1 Association Establishment Policies

##### 3.1.1.1 General

The maximum PDU size of ELEVA DI is fixed on 28K (is 28672 bytes). See also the important remark about the PDU size of the remote systems in chapter 6.2.

##### 3.1.1.2 Number of Associations

ELEVA DI will attempt to establish two Associations at a time. One Association for storage and one to receive the Worklist. ELEVA DI does not accept Associations.

##### 3.1.1.3 Asynchronous Nature

ELEVA DI does not support asynchronous operations and will not perform asynchronous window negotiation.

##### 3.1.1.4 Implementation Identifying Information

THE IMPLEMENTATION CLASS UID:	1.3.46.670589.6.1.2.1.1.1
THE IMPLEMENTATION VERSION NAME:	"DI_R111, YYMMDD"

*Note: "yymmdd" is the release date.*

#### 3.1.2 Association Acceptance Policy

The DI ELEVA Application Entity does not handle incoming associations.

### 3.1.3 Association Initiation Policy

For each request an association to the peer entity is established.

#### 3.1.3.1 Real-World Activity - Verification

The User of the DI ELEVA Graphical User Interface can invoke an association to a remote system as a result of the following events:

The ELEVA DI operator requests for DICOM export.

##### 3.1.3.1.1 Presentation Context Table

DI ELEVA Application Entity will propose the presentation contexts as given in the next table.

**Table 2. Proposed Presentation Contexts at Image Export**

Syntax Name	UID	Transfer Syntax	UID List	Role	Ext. Neg.
Verification	1.2.840.10008.1.1	ILE	1.2.840.10008.1.2	SCU	None
		ELE	1.2.840.10008.1.2.1	SCU	None
		EBE	1.2.840.10008.1.2.2	SCU	None

##### 3.1.3.1.2 SOP Specific Conformance

The DI ELEVA Application Entity provides standard conformance to the DICOM Verification Service Class.

#### 3.1.3.2 Real-World Activity - Storage

##### 3.1.3.2.1 Associated Real-World Activity

The ELEVA DI operator is able to request for export of one examination or a list of examinations to a remote system. The complete examination or a subset is transferred to the remote system.

The ELEVA DI DICOM Export function will be accessible through the ELEVA DI "F2" Copy page. With the "F4" Config page the remote DICOM system is selected from a list of maximum of five configurable nodes.

The current transfer can be aborted by the ELEVA DI "F2" Cancel function. ELEVA DI can't abort during exporting an image, the system will abort the job after the image is export correctly.

After the transfer the Association is released.

### 3.1.3.2.2 Proposed Presentation Contexts

ELEVA DI will propose the following presentation contexts:

**Table 3. Proposed Presentation Contexts at Image Export**

Syntax Name	UID	Transfer Syntax	UID List	Role	Ext. Neg.
SC Image Storage	1.2.840.10008.5.2.1.4.1.1.7	ILE	1.2.840.10008.1.2	SCU	None
		ELE	1.2.840.10008.1.2.1	SCU	None
		EBE	1.2.840.10008.1.2.2	SCU	None
X-Ray Radiofl. Image Storage	1.2.840.10008.5.1.4.1.1.12.2	ILE	1.2.840.10008.1.2	SCU	None
		ELE	1.2.840.10008.1.2.1	SCU	None
		EBE	1.2.840.10008.1.2.2	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	ILE	1.2.840.10008.1.2	SCU	None
		ELE	1.2.840.10008.1.2.1	SCU	None
		EBE	1.2.840.10008.1.2.2	SCU	None
RAW Image	1.3.46.670589.2.3.1.1	ILE	1.2.840.10008.1.2	SCU	None
		ELE	1.2.840.10008.1.2.1	SCU	None
		EBE	1.2.840.10008.1.2.2	SCU	None

### 3.1.3.2.3 SOP Specific Conformance to Storage SOP Classes

ELEVA DI provides standard conformance.  
Extended negotiation is not supported.

During the DICOM export of an exposure or fluoroscopy image as RF image the following image processing is performed by ELEVA DI: video invert, subtraction, pixel shift.

During the DICOM export of an exposure or fluoroscopy image as SC image, the following image processing is performed by ELEVA DI: video invert, contrast, brightness, edge enhancement, subtraction, pixel shift.

During the DICOM export of an external video image as SC image, the following image processing is performed by ELEVA DI: video invert, contrast, brightness, edge enhancement.

In case of a subtracted run the DICOM Export first stores the mask image, followed by the subtracted images from that run. No explicit indication is sent with the subtracted images, as to which image was used as the mask image. The image number in the run can be used as an implicit indication.

Other remarks:

Images shown zoomed on the DIS are exported as normal (i.e. non zoomed) images. Annotations on zoomed images are not sent. ELEVA DI annotations on normal images are exported as Image Comments.

The images are intended for viewing purpose only.

The compatibility of image data re-imported (by media exchange) of the exported DICOM image data in an earlier stage is not defined.

ELEVA DI logs certain events related to the DICOM export at three different levels, see the service manual of the ELEVA DI system.

Measurement data is not exported.

During the selection and export of an examination, the user interface shows the status:

Export flag examination flagged for DICOM export  
 Export busy examination being exported  
 Export done examination exported successfully  
 Export error error while exporting examination  
 Export cancel export of examination being cancelled  
 Not exported export of examination cancelled

ELEVA DI will stop the transfer of the image data and release the Association as soon as it receives an unsuccessful or warning C-STORE Response status, or when the Association is aborted by the remote system. The reason will be logged, the user interface of the ELEVA DI console will show the status "Export Error".

If a RIS connection is present, Patient and Study related information will be retrieved by ELEVA DI from the RIS and will be put in the image headers of the exported images. The UIDs in the composite images are generated when the related Study, Series and Image are created. The Image UIDs will be different if processing took place. The Study UID may be retrieved from the RIS via the Worklist

### 3.1.3.2.3.1 Overview of the applied X-Ray Fluoroscopy (RF) Image IOD

Table 3 lists the applied optional modules and attributes in the RF images.

**Table 4. Applied optional Modules and Attributes of the RF Image IOD**

IE	Module	Conditional Attributes	Optional Attributes
Patient	Patient		-
Study	General Study		Study Description
Series	General Series	Laterality.	Series Date, Series Time, Performing Physician's Name, Protocol Name
Equipment	General Equipment		Institution Name, Station Name, Manufacturer's Model name, Device Serial Number, Software Version(s)
Image	General Image Image Pixel Display Shutter (applied optional Module) X-Ray Image X-Ray Acquisition VOI LUT (applied optional Module) SOP Common	Image Date, Image Time, Patient Orientation  Shutter Left Vertical Edge, Shutter Right Vertical Edge, Shutter Upper Horizontal Edge, Shutter Lower Horizontal Edge, Center of Circular Shutter, Radius of Circular Shutter.  Exposure Window Width	Acquisition Date, Acquisition Time, Acquisition Number, Image Comments - - - - Window Center Specific Character Set

The modules selected from the IOD module table of DICOM 3.0 are given in the table below.

**Table 5. Applied Modules in the RF IOD**

Information Entity	Module
Patient	Patient
Study	General Study

Information Entity	Module
Series	General Series
Equipment	General Equipment
Image	General Image, Image Pixel, Display Shutter, X-Ray Image, X-Ray, Acquisition, VOI LUT, SOP Common

The details of these applied modules are given in the tables in Annex 2.

### 3.1.3.2.3.2 Overview of the applied SC Image IOD

Table 5 lists the applied optional modules and attributes in the SC images.

**Table 6. Applied optional Modules and Attributes of the SC Image IO**

IE	Module	Conditional Attributes	Optional Attributes
Patient	Patient		-
Study	General Study		Study Description
Series	General Series	Laterality	Series Date, Series Time, Performing Physician's Name, Protocol Name
Equipment	SC Equipment		Secondary Capture Device Manufacturer, Secondary Capture Device Manufacturer's Model Name, Secondary Capture Software Version(s)
Image	General Image Image Pixel SC Image SOP Common	Image Date, Image Time, Patient Orientation.	Acquisition Date, Acquisition Time, Acquisition Number, Image Comments - Date of Secondary Capture, Time of Secondary Capture Specific Character Set

The modules selected from the IOD module table of DICOM 3.0 are given in the table below.

**Table 7. Applied Modules in the SC IOD**

Information Entity	Module
Patient	Patient
Study	General Study
Series	General Series
Equipment	SC Equipment
Image	General Image, Image Pixel, SC Image, VOI LUT, SOP Common

The details of these applied modules are given in the tables in Annex 1.

### 3.1.3.2.3.3 Overview of the applied RAW Image IOD

Table 3 lists the applied optional modules and attributes in the RAW images.

**Table 8. Applied optional Modules and Attributes of the RAW Image IOD**

IE	Module	Conditional Attributes	Optional Attributes
Patient	Patient		-
Study	General Study		Study Description
Series	General Series	Laterality.	Series Date, Series Time, Performing Physician's Name, Protocol Name
Equipment	General Equipment		Institution Name, Station Name, Manufacturer's Model name, Device Serial Number, Software Version(s)
Image	General Image Image Pixel Display Shutter (applied optional Module) X-Ray Image X-Ray Acquisition VOI LUT (applied optional Module) SOP Common	Image Date, Image Time, Patient Orientation  Shutter Left Vertical Edge, Shutter Right Vertical Edge, Shutter Upper Horizontal Edge, Shutter Lower Horizontal Edge, Center of Circular Shutter, Radius of Circular Shutter.  Exposure Window Width	Acquisition Date, Acquisition Time, Acquisition Number, Image Comments - - - - Window Center Specific Character Set

The modules selected from the IOD module table of DICOM 3.0 are given in the table below.

**Table 9. Applied Modules in the RAW IOD**

Information Entity	Module
Patient	Patient
Study	General Study
Series	General Series
Equipment	General Equipment
Image	General Image, Image Pixel, Display Shutter, X-Ray Image, X-Ray, Acquisition, VOI LUT, SOP Common

## 3.2 ELEVA EXAMINATION CONTROL AE

The ELEVA Examination Control DICOM Application Entity provides Standard Conformance to the following DICOM 3.0 SOP classes as an SCU specified in Table 10.

**Table 10. Supported SOP Classes as SCU by the ELEVA DI DICOM AE**

SOP Class Name	UID
MWL	1.2.840.10008.5.1.4.31

The ELEVA Examination Control DICOM Application Entity does not support DICOM 3.0 SOP classes as a SCP.

### 3.2.1 Association Establishment Policies

#### 3.2.1.1 General

#### 3.2.1.2 Number of Associations

#### 3.2.1.3 Asynchronous Nature

#### 3.2.1.4 Implementation Identifying Information

THE IMPLEMENTATION CLASS UID:	1.3.46.670589.30.1.1
THE IMPLEMENTATION VERSION NAME:	PMS_PA_1.0

### 3.2.2 Association Acceptance Policy

The DI ELEVA Examination Control Application Entity does not handle incoming associations.

### 3.2.3 Association Initiation Policy

For each request an association to the peer entity is established.

#### 3.2.3.1 Real-World Activity – Management Worklist (MWL) - FIND

##### 3.2.3.1.1 Associated Real-World Activity

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.

### 3.2.3.1.2 Presentation Context Table

DI ELEVA Examination Control Application Entity will propose the presentation contexts as given in the next table.

**Table 11. Prop. Pres. Contexts for DI ELEVA Examination Control MWL SCU**

Abstract Syntax	UID	Transfer Syntax	UID List	Role	Ext. Neg.
MWL-FIND	1.2.840.10008.5.1.4.31	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: ELE is preferred

### 3.2.3.1.3 SOP Specific Conformance – MWL-FIND

By default, the patient/examination list update is performed by a “Broad” Query with pre-configured matching keys. This MWL query may be performed in the system background and may be disabled. The time interval between subsequent background queries is configurable.

The Broad Query may also be issued by the operator and will be performed from the Patient List User interface.

The table below gives an overview of the matching keys for a Broad Query.

**Table 12. Matching Keys for Broad Query**

Attribute Name	Tag	Note
Scheduled Station AE Title	0040,0001	Configurable of “ALL” or comma separated list of Application Entity names
Scheduled Procedure Step Start Date	0040,0002	Configurable of: “ALL”, “<Today”, “<Today + Tomorrow”, “<Today + Yesterday”
Modality (type)	0008,0060	“CR”, “OT”, “XA”, “RF”, “DX”, “US”

When date matching is configured, the date value is continuously generated from local system time, including a configurable nightshift tolerance in the morning hours taking the steps from “<yesterday”. The modality type query may be used for environments that do not schedule per individual modality’s AE Title, but for a modality pool.

The optional Patient Based Worklist Query is typically triggered by operator action when a patient arrives at the system for examination. ELEVA Examination Control expects the operator to enter the value(s) of the search key(s).

The table below gives an overview of the matching keys for a Patient Query

**Table 13. Matching Keys for Patient Query**

Attribute Name	Tag	Note
Patient’s Name	0010,0010	Identified from admission form.

Attribute Name	Tag	Note
Patient ID	0010,0020	Identified from admission form.
Accession Number	0008,0040	Identified from admission form.
Requested Procedure ID	0040,1001	Identified from admission form.
Scheduled Station AE Title	0040,0001	
Scheduled Procedure Step Start Date	0040,0002	This key may be optionally (default: no) added by the system. Its value is (Configurable) one of: date of <today>, date of <today> and subsequent dates, date of prior to and incl. <today>

Wildcard search (using "\*" only) is supported for "Patient Name", "Patient ID", "Accession Number", "Requested Procedure ID", and "Scheduled Station AE Title".

The Patient Query will be cancelled automatically ("auto-cancellation") by C-FIND-CANCEL request after a configurable timeout and returns only the so far respond/extracted items.

#### 3.2.3.1.3.1 Patient and Study Merge

The ELEVA DI looks in its internal database for a Study with the same Study Instance UID (0020,000D) as given in the Scheduled Procedure Step. If a Study Instance UID match was not found, it looks for a Patient with the same Patient ID (0010,0020) as given in the Scheduled Procedure Step. If no Patient match is found, a new Patient is created, using attributes from Scheduled Procedure Step. If Patient with a matching Patient ID was found, attributes are updated for the internal Patient, based on the attributes as given in the Scheduled Procedure Step.

A new Study with a Study Instance UID as given in the Scheduled Procedure Step is created. If a Study Instance UID match was found, all Patient attributes as given in the Scheduled Procedure Step are updated in the internal database for the parent patient of this study. Study attributes are updated for the internal study based on the attributes as given in the Scheduled Procedure Step.

#### 3.2.3.1.3.2 Scheduled Procedure Step (= Examination) Merge

If the Eleva DI's internal database contains no SPS with Scheduled Procedure Step ID (0040,0009) identifying an incoming Scheduled Procedure Step, it creates a new one and creates an corresponding Examination referencing this Scheduled Procedure Step ID.

If the Eleva DI's internal database contains already an SPS with the Scheduled Procedure Step ID (0040,0009) identifying an incoming Scheduled Procedure Step, the behaviour depends on the corresponding Examination state.

If the Examination is still "scheduled", the SPS attributes are compared to the attributes sent with the most recent WLM query. If at least one attribute differs, the scheduled Examination is deleted and re-scheduled. Manual changes the user might have performed on this Examination are lost.

If the Examination has already started, no changes are performed, and the potential changes of the incoming Scheduled Procedure Step are disregarded.

**Table 14. MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Pat. Ident. Module**

Attribute Name	Tag	Note
PatientName	0010,0010	Optional matching key in Patient Query
ReferencedPatientSequence <sup>3</sup>	0008,1120	
>ReferencedSOPClassUID	0008,1150	
>ReferencedSOPInstanceUID	0008,1155	
PatientID	0010,0020	Optional matching key in Patient Query
PatientOtherIDs	0010,1000	
PatientOtherNames	0010,1001	

**Table 15. MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Pat. Demogr. Module**

Attribute Name	Tag	Note
Patient's Birth Date	0010,0030	
Patient's Sex	0010,0040	
Patient Data Confidentiality Constraint Description	0040,3001	
Ethnic group	(0010,2160)	
Patient Comments	(0010,4000)	
Patient Age	0010,1010	
Patient Size	0010,1020	
Patient Weight	0010,1030	
StudyPatientsOccupation	0010,2180	

**Table 16. MWL Inform. Model - FIND SOP Class - C-FIND-RQ - Patient Medical Module**

Attribute Name	Tag	Note
Medical Alerts	0010,2000	
Contrast Allergies	0010,2110	
Additional Patient History	0010,21B0	
Pregnancy Status	0010,21C0	
Special Needs	0038,0050	
Patient State	0038,0500	

**Table 17. MWL Inform. Model - FIND SOP Class - C-FIND-RQ - Visit Status Module**

Attribute Name	Tag	Note
Current Patient Location	0038,0300	
AdmissionID	0038,0010	

**Table 18. MWL Info. Model - FIND SOP Class-C-FIND-RQ–Sched. Proced. Step Mod.**

Attribute Name	Tag	Note
Scheduled Procedure Step Sequence	0040,0100	
>Modality	0008,0060	Optional matching key for Broad and Patient Query
>Scheduled Procedure Step Start Date	0040,0002	Optional matching key for Broad and Patient Query
>Scheduled Procedure Step Start Time	0040,0003	
>Scheduled Performing Physician's Name	0040,0006	
>Scheduled Procedure Step Description	0040,0007	
>Scheduled Action Item Code Sequence	0040,0008	
>>Code Value	0008,0100	
>>Coding Scheme Designator	0008,0102	
>>Coding Scheme Version	0008,0103	
>>Code Meaning	0008,0104	
>Scheduled Procedure Step ID	0040,0009	
>Requested Contrast Agent	0032,1070	
>Scheduled AE Title	0040,0001	Optional matching key for Broad and Patient Query
>Scheduled Procedure Step End Date	0040,0004	
>Scheduled Procedure Step End Time	0040,0005	
>Scheduled Station Name	0040,0010	
>Scheduled Procedure Step Location	0040,0011	
>Pre-Medication	0040,0012	
>Scheduled Procedure Step Status	0040,0020	
>Comments on the Scheduled Procedure Step	0040,0400	

**Table 19. MWL Inform. Model - FIND SOP Class-C-FIND-RQ – Req. Procedure Module**

Attribute Name	Tag	Note
Referenced Study Sequence	0008,1110	
>Referenced SOP Class UID	0008,1150	
>Referenced SOP Instance UID	0008,1155	
Study Instance UID	0020,000D	
Requested Procedure Description	0032,1060	
Requested Procedure Code Sequence	0032,1064	
>Code Value	0008,0100	
>Coding Scheme Designator	0008,0102	
>Coding Scheme Version	0008,0103	
>Code Meaning	0008,0104	
Requested Procedure ID	0040,1001	Optional matching key for Patient Query
Names of Intended Recipients of Results	0040,1010	
Requested Procedure Comments	0040,1400	

**Table 20. MWL Inform. Model - FIND SOP Class-C-FIND-RQ – Imag. Serv. Req. Mod.**

Attribute Name	Tag	Note
Accession Number	0008,0050	Optional matching key for Patient Query
Referring Physician's Name	0008,0090	
Requesting Physician	0032,1032	
Requesting Service	0032,1033	
Imaging Service Request Comments	0040,2400	
Reason for the Imaging Service Request	0040,2001	
Issue Date of Imaging Service Request	0040,2004	
Issue Time of Imaging Service Request	0040,2005	
Order entered by ...	0040,2008	
Order Enterer's Location	0040,2009	
Order Callback Phone Number	0040,2010	

## 4 COMMUNICATION PROFILES

### 4.1 TCP/IP Stack

ELEVA DI provides DICOM 3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM 3.0 Standard.

### 4.2 Physical Media Support

The ELEVA DI system supports ISO 8802-3 10/100 MBit Ethernet.

## 5 EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

**Table 21. Mapping between UI elements on DI and DICOM attributes**

UI Element	DICOM NAME	Service
Name	Patient's Name	RIS and Export
Birthdate	Patient's Birth Date	RIS and Export
Sex	Patient's Sex	RIS and Export
Patient ID	Patient ID	RIS and Export
Exam	Sched. Proc. Step. Desc Study Description Protocol Name	RIS Export Export
Physician Name	Referring Physician's Name Referring Physician's name Performing Physician's Name	RIS Export Export

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## 6 CONFIGURATION

The configuration of a ELEVA DI system is done by means of a configuration program. It is intended to be used by Philips service engineers only.

### 6.1 DI AET

The configuration of a DI AET system is done by means of a configuration program. It is intended to be used by Philips service engineers only.

#### 6.1.1 AE Title/Presentation Address mapping

##### 6.1.1.1 Local AE Titles and Presentation Addresses

The local (so of DI AET itself) Application Entity Title, local System Name and local (System) IP Address are selected by the service configuration program.

##### 6.1.1.2 Remote AE Titles and Presentation Addresses

All remote applications to be selected as image export destination or as Worklist supplier are configurable for the following items:

- The Application Entity Title of the remote application.
- The IP Address and Port Number at which the remote application should accept Association requests.
- The Remote Host Name (i.e. System name) of the system on which the remote application resides.
- for the remote systems also the DICOM node version/type can be configured, e.g. Dicom SC & RF, Dicom SC Only, Dicom-PS VF3.1
- The Remote Host Name is used in the remote DICOM system list with the F4 Config page.

#### 6.1.2 Configurable parameters

##### 6.1.2.1 General Configurable parameters are:

The PDU size of ELEVA DI (i.e. the maximum allowed size of PDU messages received by ELEVA DI) is fixed on 28K. For optimal performance of the communication ELEVA DI - remote system, it is advised to configure the PDU size on the remote system as large as possible: unlimited and 64K are preferred (in that order). PDU size of 32K on the remote system should not be taken due to an implementation restriction of ELEVA DI, PDU size of 32 is allowed for ELEVA DIs with "HyperMEN board" for higher performance.

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## 7 SUPPORT OF EXTENDED CHARACTER SETS

ELEVA DI supports the Extended Character Set "ISO\_IR 100" (Latin alphabet No 1, supplementary set) for the Image Export function.

Some characters on the patient name display of the Digital Imaging entity will not be displayed correctly.



## ANNEX 1. Created SC Objects by the ELEVA DI DICOM AE

The following tables give a detailed overview of all supported attributes of the SC Storage SOP Class. The list of possible values are given (if applicable). The situation that an attribute is present conditionally/optionally or that an attribute may contain a zero length value, is indicated too. Conditions and Defined/Enumerated Values of DICOM 3.0 are applicable but are not shown in the tables.

Note: The shaded attributes are received from the RIS with the Worklist Management Query.

**Table 22. Secondary Capture Image Storage SOP Class -Patient Module**

Attribute Name	Tag	Note
Patient's Name	0010,0010	Received From RIS or Entered by Operator.
Patient ID	0010,0020	Received From RIS or Entered by Operator.
Patient's Birth Date	0010,0030	Received From RIS or Entered by Operator.
Patient's Sex	0010,0040	Received From RIS or Entered by Operator.

**Table 23. SC Image Storage SOP Class -General Study Module**

Attribute Name	Tag	Note
Study Date	0008,0020	
Study Time	0008,0030	
Accession Number	0008,0050	Zero length if not received from RIS.
Referring Physician's Name	0008,0090	Zero length if not received from RIS.
Study Instance UID	0020,000D	Generated at the creation of the study or received from RIS.
Study ID	0020,0010	undefined.

**Table 24. SC Image Storage SOP Class -General Series Module**

Attribute Name	Tag	Note
Series Date	0008,0021	
Series Time	0008,0031	
Modality	0008,0060	Applied Value(s): OT
Performing Physician's Name	0008,1050	Received from RIS, entered by user or is empty is not known.
Series Instance UID	0020,000E	Generated at creation of the series.
Series Number	0020,0011	
Laterality	0020,0060	Always zero length value
Performed Procedure Step Start Date	0040,0244	
Performed Procedure Step Start Time	0040,0245	
Performed Procedure Step Description	0040,0254	

**Table 25. SC Image Storage SOP Class -SC Image Equipment Module**

Attribute Name	Tag	Note
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Attribute Name	Tag	Note
Conversion Type	0008,0064	Applied Value(s): DV
Manufacturer	0008,0070	Applied Value(s): Philips Medical Systems
Secondary Capture Device Manufacturer's Model Name	0018,1018	Applied Value(s): Digital Imaging
Secondary Capture Device Software Version(s)	0018,1019	

**Table 26. SC Image Storage SOP Class -General Image Module**

Attribute Name	Tag	Note
Acquisition Date	0008,0022	
Content Date	0008,0023	
Acquisition Time	0008,0032	
Content Time	0008,0033	
Acquisition Number	0020,0012	
Instance Number	0020,0013	Applied Value(s): 1-n
Patient Orientation	0020,0020	Always zero length value
Image Comments	0020,4000	Contains also the ELEVA DI image annotations on normal (i.e. non zoomed) images in the format --(x,y) text --. This attribute is not present if not entered by user and if no annotations are present.

**Table 27. Secondary Capture Image Storage SOP Class -Image Pixel Module**

Attribute Name	Tag	Note
Samples per Pixel	0028,0002	Applied Value(s): 1
Photometric Interpretation	0028,0004	Applied Value(s): MONOCHROME2
Rows	0028,0010	Equal to the value of Rows (512 or 1024). The actual size in systems equipped with XTV9 camera is smaller: 500 or 1000. Applied Value(s): 1024, 512
Columns	0028,0011	Equal to the value of Rows (512 or 1024). The actual image size in 60 Hz ELEVA DI system is smaller: 470 or 960. Applied Value(s): 1024, 512
Bits Allocated	0028,0100	Applied Value(s): 8
Bits Stored	0028,0101	Applied Value(s): 8
High Bit	0028,0102	Applied Value(s): 7
Pixel Representation	0028,0103	Applied Value(s): 0000
Pixel Data	7FE0,0010	

**Table 28. Secondary Capture Image Storage SOP Class -Sc Image Module**

Attribute Name	Tag	Note
Date of Secondary Capture	0018,1012	
Time of Secondary Capture	0018,1014	

**Table 29. Secondary Capture Image Storage SOP Class -Voi Lut Module**

Attribute Name	Tag	Note
Window Center	0028,1050	
Window Width	0028,1051	

**Table 30. SC Image Storage SOP Class -Sop Common Module**

Attribute Name	Tag	Note
Specific Character Set	0008,0005	Applied Value(s): ISO_IR 100
SOP Class UID	0008,0016	Applied Value(s): 1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	0008,0018	Generated at creation of the image.

## ANNEX 2. Created XRF Objects by the ELEVA DI DICOM AE

The following tables give a detailed overview of all supported attributes of the XA Storage SOP Class. The list of possible values are given. The situation that an attribute is present conditionally/optionally or that an attribute may contain a zero length value, is indicated too. Conditions and Defined/Enumerated Values of DICOM 3.0 are applicable but are not shown in the tables.

*Note: The shaded attributes are received from the RIS with the Worklist Management Query.*

**Table 31. X-Ray Radiofluoroscopic Image Storage SOP Class -Patient Module**

Attribute Name	Tag	Note
Patient's Name	0010,0010	Received From RIS or Entered by Operator.
Patient ID	0010,0020	Received From RIS or Entered by Operator.
Patient's Birth Date	0010,0030	Received From RIS or Entered by Operator.
Patient's Sex	0010,0040	Received From RIS or Entered by Operator.

**Table 32. X-Ray Radiofluor. Image Storage SOP Class -General Study Module**

Attribute Name	Tag	Note
Study Date	0008,0020	
Study Time	0008,0030	
Accession Number	0008,0050	Zero length if not received from RIS.
Referring Physician's Name	0008,0090	Zero length if not received from RIS.
Study Instance UID	0020,000D	Generated at the creation of the study or received from RIS.
Study ID	0020,0010	Undefined.

**Table 33. X-Ray Radiofluor. Image Storage SOP Class -General Series Module**

Attribute Name	Tag	Note
Series Date	0008,0021	
Series Time	0008,0031	
Modality	0008,0060	Applied Value(s): RF
Performing Physician's Name	0008,1050	Received from RIS, entered by user or is empty if not known.
Series Instance UID	0020,000E	
Series Number	0020,0011	
Laterality	0020,0060	Always zero length value.
Performed Procedure Step Start Date	0040,0244	
Performed Procedure Step Start Time	0040,0245	
Performed Procedure Step Description	0040,0254	

**Table 34. X-Ray Radiof. Image Storage SOP Class-General Equipment Module**

Attribute Name	Tag	Note
Manufacturer	0008,0070	Applied Value(s): Philips Medical Systems
Institution Name	0008,0080	Name of the Hospital (configurable)
Station Name	0008,1010	Name of the System (configurable)
Manufacturer's Model Name	0008,1090	Applied Value(s): ELEVA DI R1.1.1
Device Serial Number	0018,1000	
Software Version(s)	0018,1020	Applied Value(s): R1.1 LUTPROM 02-09-04 R6.1.1

**Table 35. X-Ray Radiofluor. Image Storage SOP Class -General Image Module**

Attribute Name	Tag	Note
Acquisition Date	0008,0022	
Content Date	0008,0023	
Acquisition Time	0008,0032	
Content Time	0008,0033	
Acquisition Number	0020,0012	
Instance Number	0020,0013	
Patient Orientation	0020,0020	Always zero length value.
Image Comments	0020,4000	Contains also the ELEVA DI image annotations on normal (i.e. non zoomed) images in the format --(x,y) text --. This attribute is not present if not entered by user and if no annotations are present.

**Table 36. X-Ray Radiofluor. Image Storage SOP Class -Image Pixel Module**

Attribute Name	Tag	Note
Samples per Pixel	0028,0002	Applied Value(s): 1
Photometric Interpretation	0028,0004	Applied Value(s): MONOCHROME2
Rows	0028,0010	Equal to the value of Rows (512 or 1024). The actual size in systems equipped with XTV9 camera is smaller: 500 or 1000. Applied Value(s): 1024, 512
Columns	0028,0011	Equal to the value of Rows (512 or 1024). The actual image size in 60 Hz ELEVA DI system is smaller: 470 or 960. Applied Value(s): 1024, 512
Bits Allocated	0028,0100	Applied Value(s): 8
Bits Stored	0028,0101	Applied Value(s): 8
High Bit	0028,0102	Applied Value(s): 7
Pixel Representation	0028,0103	Applied Value(s): 0000
Pixel Data	7FE0,0010	

**Table 37. X-Ray Radiofl. Image Storage SOP Class -Display Shutter Module**

Attribute Name	Tag	Note
Shutter Shape	0018,1600	Applied Value(s): CIRCULARRECTANGULAR
Shutter Left Vertical Edge	0018,1602	
Shutter Right Vertical Edge	0018,1604	
Shutter Upper Horizontal Edge	0018,1606	
Shutter Lower Horizontal Edge	0018,1608	
Center of Circular Shutter	0018,1610	
Radius of Circular Shutter	0018,1612	

**Table 38. X-Ray Radiofluor. Image Storage SOP Class -X-ray Image Module**

Attribute Name	Tag	Note
Image Type	0008,0008	Applied Value(s): ORIGINAL, PRIMARY, SINGLE PLANE
Samples per Pixel	0028,0002	
Photometric Interpretation	0028,0004	
Bits Allocated	0028,0100	
Bits Stored	0028,0101	
High Bit	0028,0102	
Pixel Representation	0028,0103	
Pixel Intensity Relationship	0028,1040	Applied Value(s): DISP

**Table 39. X-Ray Radiofl. Image Storage SOP Class -X-ray Acquisition Module**

Attribute Name	Tag	Note
KVP	0018,0060	Always zero length value.
Exposure	0018,1152	Always zero length value.
Radiation Setting	0018,1155	Applied Value(s): GR, SC

**Table 40. X-Ray Radiofluoroscopic Image Storage SOP Class -Voi Lut Module**

Attribute Name	Tag	Note
Window Center	0028,1050	This attribute is related to the ELEVA DI Contrast / Brightness.
Window Width	0028,1051	This Attribute is related to the ELEVA DI Contrast / Brightness.

**Table 41. X-Ray Radiofluor. Image Storage SOP Class -Sop Common Module**

Attribute Name	Tag	Note
Specific Character Set	0008,0005	Applied Value(s): ISO_IR 100
SOP Class UID	0008,0016	Applied Value(s): 1.2.840.10008.5.1.4.1.1.12.2
SOP Instance UID	0008,0018	

## ANNEX 3. Created Present. State Object by the ELEVA DI DICOM AE

**Table 42. Softcopy PS Storage SOP Class - C-STORE-RQ - Patient Module**

Attribute Name	Tag	Note
Patient's Name	0010,0010	Patient's full name.
Patient ID	0010,0020	Primary hospital identification number or code for the patient.
Patient's Birth Date	0010,0030	Birth data of the patient.
Patient's Sex	0010,0040	Sex of the named patient. Applied Value(s): F, M, O

**Table 43. Softcopy PS Storage SOP Class - C-STORE-RQ - Gen. Study Module**

Attribute Name	Tag	Note
Study Date	0008,0020	Date the study started.
Study Time	0008,0030	Time the study started.
Accession Number	0008,0050	A RIS generated number which identifies the order of the study.
Referring Physician's Name	0008,0090	Patient's referring physician.
Study Instance UID	0020,000D	Unique identifier for the Study.
Study ID	0020,0010	User or equipment generated Study identifier.

**Table 44. Softcopy PS Storage SOP Class - C-STORE-RQ -Gen. Series Module**

Attribute Name	Tag	Note
Series Date	0008,0021	Date the Series started.
Series Time	0008,0031	Time the Series started.
Performing Physician's Name	0008,1050	Name of the Physicians administering the Series.
Series Instance UID	0020,000E	Unique identifier of the Series.
Series Number	0020,0011	A number that identifies the Series.
Laterality	0020,0060	Laterality of (paired) body part examined. Required if the body part examined is a paired structure. Applied Value(s): L, R
Performed Procedure Step Start Date	0040,0244	
Performed Procedure Step Start Time	0040,0245	
Performed Procedure Step Description	0040,0254	

**Table 45. Softcopy PS Storage SOP Class-C-STORE-RQ-Gen. Equipm. Module**

Attribute Name	Tag	Note
Manufacturer	0008,0070	Manufacturer of the equipment that produced the digital images.
Institution Name	0008,0080	Institution where the equipment is located that produced the digital images.
Station Name	0008,1010	User defined name identifying the machine that produced the digital images.

Attribute Name	Tag	Note
Manufacturer's Model Name	0008,1090	Manufacturers model number of the equipment that produced the digital images.
Device Serial Number	0018,1000	Manufacturers serial number of the equipment that produced the digital images.
Software Version(s)	0018,1020	Manufacturers designation of software version of the equipment that produced the digital images.

**Table 46. Softcopy PS Storage SOP Class-C-STORE-RQ-Sop Common Mod.**

Attribute Name	Tag	Note
Specific Character Set	0008,0005	Required if an expanded or replacement character set is used. Applied Value(s): ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 159, ISO 2022 IR 166, ISO 2022 IR 6, ISO 2022 IR 87, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO_IR 138, ISO_IR 144, ISO_IR 148, ISO_IR 166
SOP Class UID	0008,0016	Mandatory for Composite IODs only.
SOP Instance UID	0008,0018	Mandatory for Composite IODs only.

**Table 47. Softcopy PS Stor. SOP Class-C-STORE-RQ-Softcopy VOI LUT Mod.**

Attribute Name	Tag	Note
Softcopy VOI LUT Sequence	0028,3110	
>Window Center	0028,1050	
>Window Width	0028,1051	

**Table 48. Softcopy PS Stor. SOP Class-C-STORE-RQ-Softcopy Pres. Lut Mod.**

Attribute Name	Tag	Note
Presentation LUT Shape	2050,0020	

**Table 49. Softcopy PS Storage SOP Class-C-STORE-RQ-Disp. Area Module**

Attribute Name	Tag	Note
Displayed Area Selection Sequence	0070,005A	
>Displayed Area Top Left Hand Corner	0070,0052	
>Displayed Area Bottom Right Hand Corner	0070,0053	
>Presentation Size Mode	0070,0100	Applied Value(s): MAGNIFY, SCALE TO FIT, TRUE SIZE
>Presentation Pixel Aspect Ratio	0070,0102	



**Table 50. Softcopy PS Storage SOP Class-C-STORE-RQ-Pres. State Module**

Attribute Name	Tag	Note
Referenced Series Sequence	0008,1115	
>Referenced Image Sequence	0008,1140	
>>Referenced SOP Class UID	0008,1150	
>>Referenced SOP Instance UID	0008,1155	
>Series Instance UID	0020,000E	
Instance Number	0020,0013	
Presentation Label	0070,0080	
Presentation Description	0070,0081	
Presentation Creation Date	0070,0082	
Presentation Creation Time	0070,0083	
Presentation Creator's Name	0070,0084	

**Table 51. Softcopy PS Storage SOP Class-C-STORE-RQ - Pres. Series Module**

Attribute Name	Tag	Note
Modality	0008,0060	Applied Value(s): PR

**Table 52. Softcopy PS Storage SOP Class-C-STORE-RQ-Graphic Layer Mod.**

Attribute Name	Tag	Note
Graphic Layer Sequence	0070,0060	
>Graphic Layer	0070,0002	
>Graphic Layer Order	0070,0062	

**Table 53. Softcopy PS Storage SOP Class-C-STORE-RQ-Graphic Annot. Mod.**

Attribute Name	Tag	Note
Graphic Annotation Sequence	0070,0001	
>Graphic Layer	0070,0002	
>Text Object Sequence	0070,0008	
>>Bounding Box Annotation Units	0070,0003	
>>Anchor Point Annotation Units	0070,0004	Applied Value(s): DISPLAY, PIXEL
>>Unformatted Text Value	0070,0006	
>>Bounding Box TLHC	0070,0010	
>>Bounding Box BRHC	0070,0011	
>>Bounding Box Text Horizontal Justification	0070,0012	Applied Value(s): CENTER, LEFT, RIGHT
>>Anchor Point	0070,0014	
>>Anchor Point Visibility	0070,0015	Applied Value(s): N, Y
>>Private Creator Group 2001	2001,0010	Applied Value(s): Philips Imaging DD001

Attribute Name	Tag	Note
>>Measurement Text Units	2001,105D	
>>Measurement Text Type	2001,105E	
>Graphic Object Sequence	0070,0009	
>>Graphic Annotation Units	0070,0005	
>>Graphic Dimensions	0070,0020	
>>Number of Graphics Points	0070,0021	
>>Graphic Data	0070,0022	
>>Graphic Type	0070,0023	Applied Value(s): CIRCLE, ELLIPSE, INTERPOLATED, POINT, POLYLINE
>>Graphic Filled	0070,0024	Applied Value(s): N, Y
>>Private Creator Group 2001	2001,0010	Applied Value(s): Philips Imaging DD001
>>Graphic Line Style	2001,1046	
>>Poly Line Interpolation Method	2001,104B	
>>Poly Line Begin Point Style	2001,104C	
>>Poly Line End Point Style	2001,104D	
>Private Creator Group 2001	2001,0010	Applied Value(s): Philips Imaging DD001
>MR Series NR of Chemical Shifts	2001,105A	

## ANNEX 4. Created RAW Image Objects by the ELEVA DI DICOM AE

The following tables give a detailed overview of all supported attributes of the RAW Image Storage SOP Class. The list of possible values are given. The situation that an attribute is present conditionally/optionally or that an attribute may contain a zero length value, is indicated too. Conditions and Defined/Enumerated Values of DICOM 3.0 are applicable but are not shown in the tables.

*Note: The shaded attributes are received from the RIS with the Worklist Management Query.*

**Table 54. RAW Image Storage SOP Class -Patient Module**

Attribute Name	Tag	Note
Patient's Name	0010,0010	Received From RIS or Entered by Operator.
Patient ID	0010,0020	Received From RIS or Entered by Operator.
Patient's Birth Date	0010,0030	Received From RIS or Entered by Operator.
Patient's Sex	0010,0040	Received From RIS or Entered by Operator.

**Table 55. RAW Image Storage SOP Class -General Study Module**

Attribute Name	Tag	Note
Study Date	0008,0020	
Study Time	0008,0030	
Accession Number	0008,0050	Zero length if not received from RIS.
Referring Physician's Name	0008,0090	Zero length if not received from RIS.
Study Instance UID	0020,000D	Generated at the creation of the study or received from RIS.
Study ID	0020,0010	Always zero.

**Table 56. RAW Image Storage SOP Class -General Series Module**

Attribute Name	Tag	Note
Series Date	0008,0021	
Series Time	0008,0031	
Modality	0008,0060	Applied Value(s): RF
Performing Physician's Name	0008,1050	Received from RIS, entered by user or is empty if not known.
Series Instance UID	0020,000E	
Series Number	0020,0011	
Laterality	0020,0060	Always zero length value.

**Table 57. RAW Image Storage SOP Class -General Equipment Module**

Attribute Name	Tag	Note
Manufacturer	0008,0070	Applied Value(s): Philips Medical Systems
Institution Name	0008,0080	
Station Name	0008,1010	
Manufacturer's Model Name	0008,1090	Applied Value(s): ELEVA DI R5.2.2
Device Serial Number	0018,1000	
Software Version(s)	0018,1020	Applied Value(s): R5.2.2 LUTPROM 97-10-20 R2.1.1

**Table 58. RAW Image Storage SOP Class -General Image Module**

Attribute Name	Tag	Note
Acquisition Date	0008,0022	
Content Date	0008,0023	
Acquisition Time	0008,0032	
Content Time	0008,0033	
Acquisition Number	0020,0012	
Instance Number	0020,0013	
Patient Orientation	0020,0020	Always zero length value.
Image Comments	0020,4000	Contains also the ELEVA DI image annotations on normal (i.e. non zoomed) images in the format --(x,y) text --. This attribute is not present if not entered by user and if no annotations are present.

**Table 59. RAW Image Storage SOP Class -Image Pixel Module**

Attribute Name	Tag	Note
Samples per Pixel	0028,0002	Applied Value(s): 1
Photometric Interpretation	0028,0004	Applied Value(s): MONOCHROME2
Rows	0028,0010	Equal to the value of Rows (512 or 1024). The actual size in systems equipped with XTV9 camera is smaller: 500 or 1000. Applied Value(s): 1024, 512
Columns	0028,0011	Equal to the value of Rows (512 or 1024). The actual image size in 60 Hz ELEVA DI system is smaller: 470 or 960. Applied Value(s): 1024, 512
Bits Allocated	0028,0100	Applied Value(s): 8
Bits Stored	0028,0101	Applied Value(s): 8
High Bit	0028,0102	Applied Value(s): 7
Pixel Representation	0028,0103	Applied Value(s): 0000
Pixel Data	7FE0,0010	

**Table 60. RAW Image Storage SOP Class -Display Shutter Module**

Attribute Name	Tag	Note
Shutter Shape	0018,1600	Applied Value(s): CIRCULARRECTANGULAR
Shutter Left Vertical Edge	0018,1602	
Shutter Right Vertical Edge	0018,1604	
Shutter Upper Horizontal Edge	0018,1606	
Shutter Lower Horizontal Edge	0018,1608	
Center of Circular Shutter	0018,1610	
Radius of Circular Shutter	0018,1612	

**Table 61. RAW Image Storage SOP Class -X-ray Image Module**

Attribute Name	Tag	Note
Image Type	0008,0008	Applied Value(s): ORIGINAL, PRIMARY, SINGLE PLANE
Samples per Pixel	0028,0002	
Photometric Interpretation	0028,0004	
Bits Allocated	0028,0100	
Bits Stored	0028,0101	
High Bit	0028,0102	
Pixel Representation	0028,0103	
Pixel Intensity Relationship	0028,1040	Applied Value(s): DISP

**Table 62. RAW Image Storage SOP Class -X-ray Acquisition Module**

Attribute Name	Tag	Note
KVP	0018,0060	Always zero length value.
Exposure	0018,1152	Always zero length value.
	0018,1155	Applied Value(s): GR, SC

**Table 63. RAW Image Storage SOP Class -Voi Lut Module**

Attribute Name	Tag	Note
Window Center	0028,1050	This attribute is related to the ELEVA DI Contrast / Brightness.
Window Width	0028,1051	This Attribute is related to the ELEVA DI Contrast / Brightness.

**Table 64. X RAW Image Storage SOP Class -Sop Common Module**

Attribute Name	Tag	Note
Specific Character Set	0008,0005	Applied Value(s): ISO_IR 100
SOP Class UID	0008,0016	Applied Value(s): 1.2.840.10008.5.1.4.1.1.12.2
SOP Instance UID	0008,0018	