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# DICOM

## Conformance Statement

### ELEVA DI (Ditto) Systems

MultiDiagnost R2.3.2

OmniDiagnost R2.3.2

UroDiagnost R2.3.2

EasyDiagnost R1.3.2



***Issued by:***

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## 1 DICOM CONFORMANCE STATEMENT OVERVIEW

The ELEVA DI System in a DICOM Network environment exists of 2 components a

- ELEVA Examination Control, to retrieve an Worklist from an Radiology Information System, and an
- ELEVA Digital Imaging DI (or Ditto) to transfer ELEVA DI ( or Ditto) Image data to a remote system.

The ELEVA DI (Ditto) System is an Digital Fluorography modality and is part of an X-Ray System.

Depending on the purchased options and chosen configuration, the ELEVA DI (Ditto) System provides the following DICOM data exchange features:

- Request Worklist / MPPS functionality
- Issue Procedure information to RIS / HIS System
- Image acquisition and display
- Image review and processing
- Image handling, storage and networking,
- Administration of patient, physician and examination data.
- Copy images from the local database to remote databases.

The main application areas are:

- R/F examinations
- Vascular and non-vascular examinations
- Angiography and tomography examinations
- interventional procedures

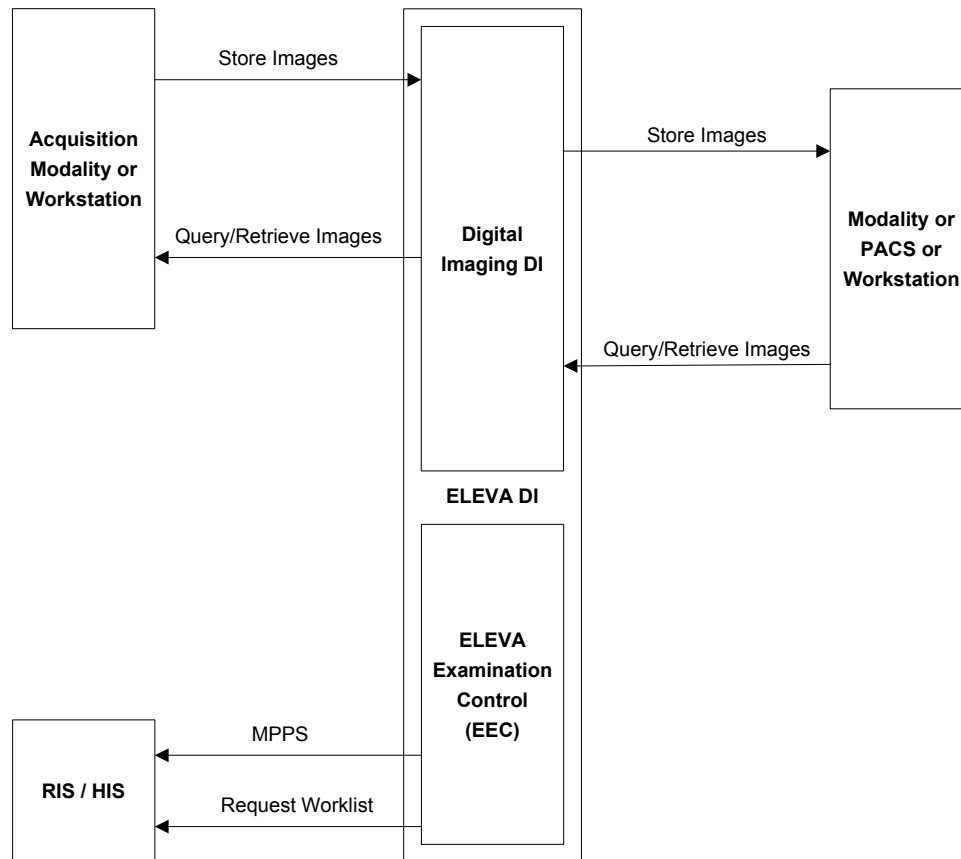


Figure 1: ELEVA DI (Ditto) System in a DICOM Network environment

ELEVA DI (Ditto) allows the operator also to view, analyze and process the images stored in the database. Some advanced analysis and processing applications are primarily designed for images generated by Philips equipment when sent to the ELEVA DI (Ditto).

This DICOM Conformance Statement describes the DICOM conformance of the ELEVA DI (Ditto) platform. Application package specific DICOM conformance is described in separate Conformance Statements.

Table 1 presents an overview of all network services and the applicable SOP classes as provided by ELEVA DI (Ditto).

**Table 1: Network Services**

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
<b>Storage for the NON PRO Mode (RF + SC, SC only and RAW)</b>			
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
Specialized X-Ray	1.3.46.670589.2.3.1.1	Yes	No
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
<b>Workflow Management</b>			
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	No	Yes
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	No	Yes

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## 3 INTRODUCTION

### 3.1 Revision History

**Table 2: Revision History**

Document Version	Date of Issue	Author	Description
00	08-03-2005	PMS MIT-IO	Preliminary version of the DICOM Conformance Statement for ELEVA DI(Ditto) Release 2
01	07-06-2005	PMS MIT-IO	Update Document, Commit Collect
02	03-11--2005	PMS MIT-IO	Final version of the DICOM Conformance Statement for ELEVA DI(Ditto) Release 2

### 3.2 Audience

This DICOM 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 1 through 8 and follows the contents and structuring requirements of the DICOM Standard PS 3.2- XXXX.

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 assure that the actual implementation of the DICOM interface corresponds with this DICOM Conformance Statement. Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant DICOM Conformance Statements. If the DICOM 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).

### 3.4 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-XXXX and PS 3.4-XXXX.

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

The following acronyms and abbreviations may be used in this document.

AE	Application Entity
ACR	American College of Radiology
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
EBE	DICOM Explicit VR Big Endian
EEC AE	ELEVA Examination Control Application Entity
ELE	DICOM Explicit VR Little Endian
GUI	Graphical User Interface
HIPAA	Health Insurance Portability and Accountability Act
ILE	DICOM Implicit VR Little Endian
IHE	Integrating the Healthcare Enterprise
IOD	Information Object Definition
NA	Not Applicable
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
PMS(N)	Philips Medical Systems (Nederland B.V.)
Q/R	Query/Retrieve (Service Class)
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

**The following terms are used in this document.**

**Image Archive (PACS)**

A system that provides long term storage of images, Presentation States, Key Image Notes and Evidence Documents [IHE].

**Department System Scheduler**

A department-based information system that provides functions related to the management of orders received from external systems or through the department system's user interface. Upon a defined workflow action, makes procedures available for charge posting. The actor defines the action/event that actually causes charges to post [IHE].

**Performed Procedure Step Manager**

A system that re-distribute the Modality Performed Procedure Step Information from the Acquisition Modality or image Creator to the Department System Scheduler/Order Filler and Image Manager [IHE].

**Image Display (ViewForum)**

A system that offers browsing of patients studies. In addition, it may support the retrieval and display of selected sets of images, Presentation States, Key Image Notes, and Evidence Documents [IHE].

For the combination of a DI ELEVA System with an ViewForum Image Workstation see the EDI ELEVA Conformance Statement.

### 3.5 References

- [DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 16 (NEMA PS 3.1 – PS 3.16), National Electrical Manufacturers Association (NEMA) Publication Sales 1300 N. 17<sup>th</sup> Street, Suite 1847 Rosslyn, Virginia. 22209, United States of America
- [IHE] Integrating the Healthcare Enterprise (IHE) Technical Framework Revision 5.4: Radiological Society of North America (RSNA), Inc. 820 Jorie Boulevard, Oak Brook, IL, United States of America
- [NTP] RFC 1305: Network Time Protocol Version 3.
- [SYSLOG] RFC 3164: The BSD Syslog Protocol.
- [TLS] RFC 2246: Transport Layer Security protocol (TLS) v1.0.

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## 4 NETWORKING

This section contains the networking related services.

### 4.1 IMPLEMENTATION MODEL

The implementation model consists of two sections:

- The Application Data Flow Diagram, specifying the relationship between the ELEVA DI (Ditto) Application Entity and the “external world” or Real-World Activities,
- A functional description of the ELEVA DI (Ditto) Application Entity, and
- the sequencing constraints among them.

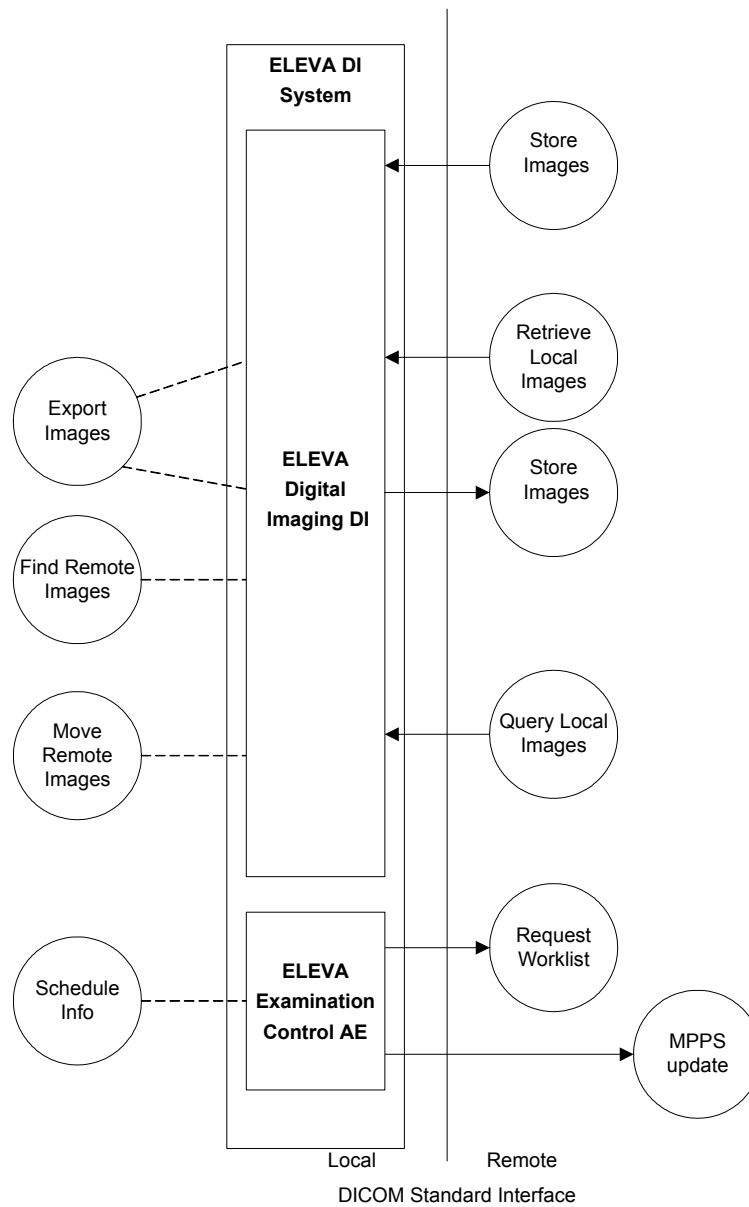
#### 4.1.1 Application Data Flow

The **ELEVA DI System** consists of two Application Entities:

- the **ELEVA DI ( ELEVA DI AE )** and
- the **ELEVA Examination Control AE ( EEC AE )**

Figure 2 shows the Networking application data flow as a functional overview of the ELEVA DI System. As depicted the ELEVA DI System incorporates the following functionality.

- After RWA Query of Local Images / Retrieve of Local Images, the ELEVA DI System as SCP provides standard Query/Retrieve Service Class functionality to the requesting SCU.
- After RWA Export Images (triggered by either the operator or RWA Retrieve Local Images), the ELEVA DI System as SCU uses the remote SCP Storage Service Class functionality to store local images on a remote database.
- The ELEVA DI System can request a Worklist from a remote system such as a RIS / HIS system. The ELEVA DI System can issue the request information using the Modality Performed Procedure Step service to update the RIS.



**Figure 2: Networking Application Data Flow Diagram of the ELEVA DI System**

**4.1.2 Functional Definition of AE's**

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

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#### 4.1.2.1 Functional Definition of ELEVA DI System

The ELEVA DI System includes the following service classes:

##### **Storage Service Class**

The ELEVA DI AE can perform the Storage service as SCU (RWA Export Images, triggered by the operator or with an retrieve request).

The ELEVA DI AE shall request an association with the selected remote SCP for all applicable Storage SOP classes. When the association is accepted, the ELEVA DI AE shall send the Storage requests (including data from the local database), receive the Storage responses and act accordingly and release the association.

Image data to be transferred are instances of the DICOM

- X-Ray Radiofluoroscopic (XRF),
- Secondary Capture (SC) or
- RAW Image data (private).

The system can be configured either for the NON PRO Mode or the PRO Mode.

If the system is configured for the **NON PRO Mode**, the system supports RF, SC and RAW Image SOP Classes. The following cases can be distinguished:

- 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.
- The system is configured to support RF and SC classes. All images are exported as RF images. If the SCP system does not support RF images, the RF images are exported as SC images.

RAW Image data exits of the Specialized SOP Class and the Greyscale Softcopy Presentation State SOP Class.

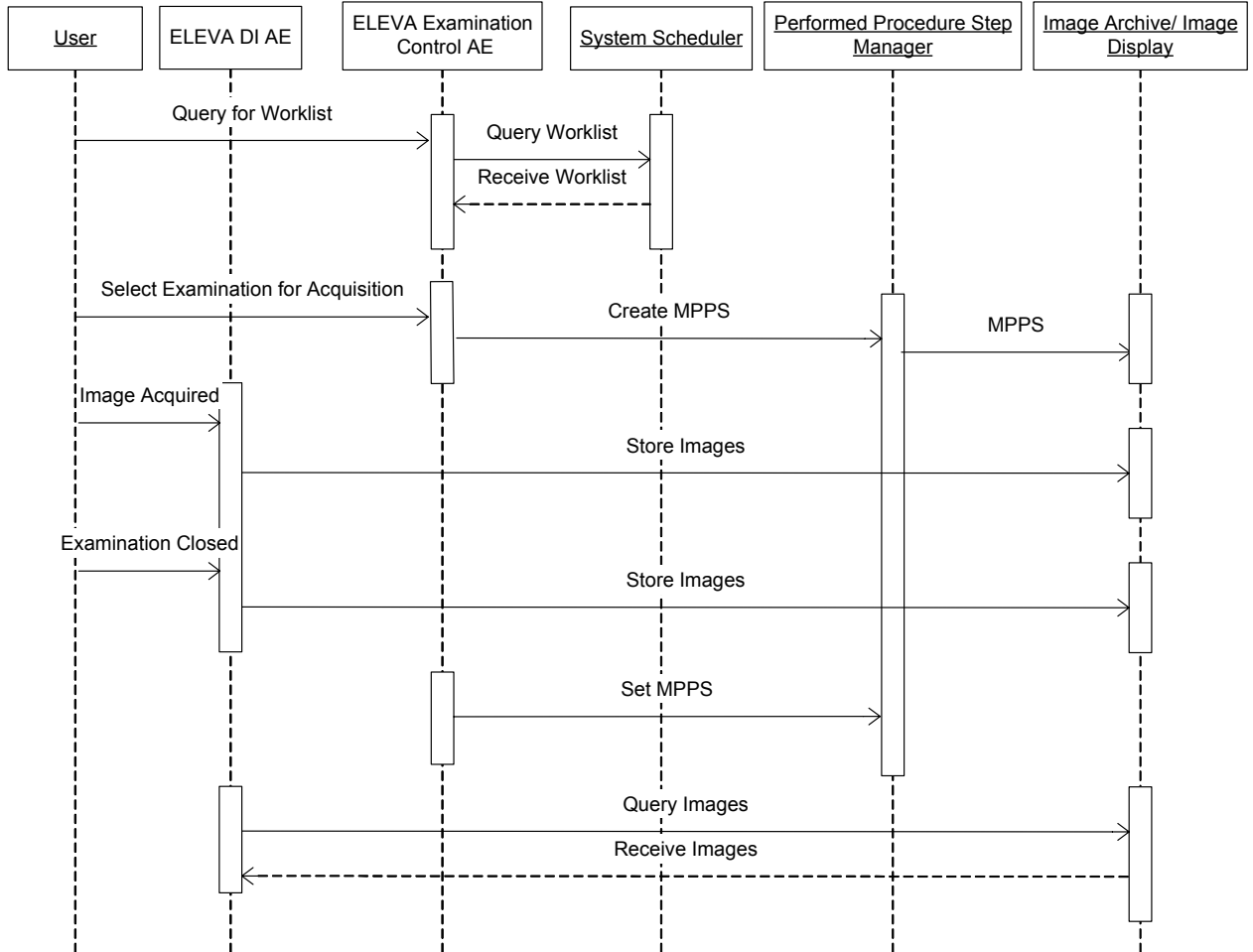
##### **Worklist Service Class**

The ELEVA Examination Control Application Entity (EEC AE) acts as a Service Class User (SCU) for Worklist.

#### 4.1.3 Sequencing of Real World Activities

This section shall contain a description of specific sequencing as well as potential constraints of Real-World Activities, including any applicable user interactions, as performed by the ELEVA DI System.

Examinations, identified with a new UID, are created inside the **ELEVA Examination Control AE** (EEC AE) as result of Worklist management or on manual scheduling by the clinical user.



**Figure 3: Sequencing of the Real World Activities of ELEVA DI System**

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 the 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 from the DI and related data from DI and EEC, are added to the examination selected for acquisition in DI and EEC. The composite images acquired can be forwarded to for instance to a ViewForum system, to be viewed, and exported from here. When the clinical user has explicitly indicated on the EEC that the examination is finished and /or can be deleted, this will be communicated to the DI, and the Examination instance is deleted here also, as

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soon as automatic export (AUTOPUSH) to for instance an ViewForum has taken place.

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 ELEVA DI will be exported as "normal" (i.e. non Zoomed) images.

ELEVA DI Annotations on an "normal" images are exported as Image Comments. Annotations on Zoomed images are not sending out.

The ELEVA DI will stop the transfer of images 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.

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.

## 4.2 AE SPECIFICATIONS

The next section in the DICOM Conformance Statement contains the specification of the Network capabilities of the **ELEVA DI System** consists of two DICOM Application Entities:

- **ELEVA DI AE (ELEVA DI AE)**
- **ELEVA Examination Control AE (EEC AE)**

The functions supported by these AE are specified in the sections 4.2.1 and 4.2.2.

### 4.2.1 ELEVA DI AE

The ELEVA DI Application Entity provides Standard Extended Conformance to the DICOM V3.0 SOP classes as SCU/SCP as specified in Table 3.

The following remarks are important for the ELEVA DI NON PRO Mode:

- In case the remote system does not support the import of a specific Image Storage SOP Class, the ELEVA DI AE will convert (if configured to do so) these images and sends them via the SC Image SOP Class to the remote system..

#### 4.2.1.1 Supported SOP Classes by the ELEVA DI AE as SCP/SCU.

This Application Entity provides extended Standard Conformance to the following SOP classes.

**Table 3: SOP Classes for ELEVA DI AE, NON PRO Mode**

SOP Class Name	SOP Class UID	SCU	SCP
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
Specialized X-Ray	1.3.46.670589.2.3.1.1	Yes	No

**4.2.1.2 Association Policies**

This section shall contain a description of the General Association Establishment and Acceptance policies of the AE.

**4.2.1.2.1 General**

The ELEVA DI (Ditto) AE System as SCU will offer restricted maximum PDU size of 28 Kbyte on Associations initiated by an Workstation for instance an ViewForum system.

The DICOM standard application context shall be specified.

**Table 4: DICOM Application Context**

Application Context Name	1.2.840.10008.3.1.1.1
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**4.2.1.2.2 Number of Associations**

The number of simultaneous Associations supported by ELEVA DI AE System as a Service Class Provider (SCP) is limited.

**Table 5: Number of Associations as an Association Initiator for ELEVA DI AE System**

Maximum number of simultaneous associations	1
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As a result of local activities, ELEVA DI AE System will initiate 1 simultaneous associations at a time.

**4.2.1.2.3 Asynchronous Nature**

ELEVA DI System does support asynchronous operations.

**Table 6: Asynchronous Nature as an Association Initiator for ELEVA DI AE System**

Maximum number of outstanding asynchronous transactions	N/A
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#### 4.2.1.2.4 Implementation Identifying Information

Following Implementation Class UID and Version Name are defined.

**Table 7: DICOM Implementation Class and Version for ELEVA DI AE System**

THE IMPLEMENTATION CLASS UID:	1.3.46.670589.6.1.2.1.1.1
The Implementation Version Name:	DI R111, 030301 for DI or R2.1.2.0010 for DITTO

#### 4.2.1.3 Association Initiation Policy

ELEVA DI AE System shall initiate associations as a result of the following events.

- The ELEVA DI AE System operator or a remote (Query/Retrieve) application copies selected images from the ELEVA DI AE database to another system database; ref. section 4.2.1.3.1 Export Images.

#### 4.2.1.3.1 Export Images

##### 4.2.1.3.1.1 Description and Sequencing of Activities

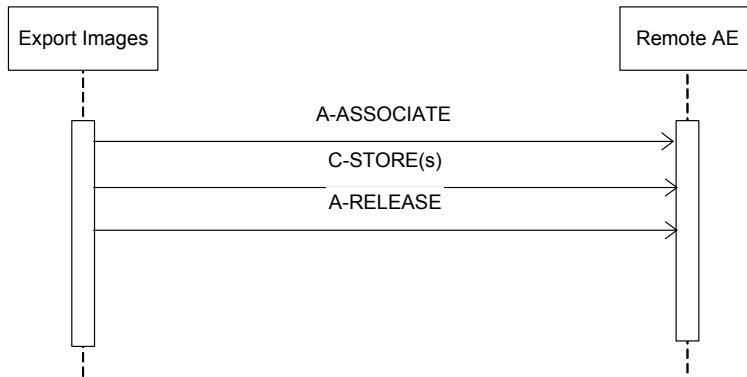
The RWA Export Images involves the storage of images from the local ELEVA DI AE System database to a remote system.

There are two ways for the ELEVA DI AE System to initiate Export Images.

1. The operator is able to copy the images selected in a patient folder from the local ELEVA DI AE System database to another database by means of the copy tool in the ELEVA DI AE System data-handling tool. For each selected patient ELEVA DI AE System initiates an association to the selected peer entity, and uses it to send C-STORE requests and receive the associated C-STORE responses. The association is released when all selected images in the selected folder have been transmitted.  
ELEVA DI AE System handles operator copy requests one after another.
2. The images selected in a patient folder from the local ELEVA DI AE System database are AUTOPUSHED to another database

Along with the RAW image data the ELEVA DI AE System shall also export presentation state data. If the SCP supports the Grayscale Softcopy Presentation State storage SOP class then the applicable presentation state data will be transferred as such.

Figure 4 shows the sequence of events after the operator or remote application initiates the RWA Export Images.



**Figure 4: Sequencing of RWA Export Images**

**4.2.1.3.1.2 Proposed Presentation Contexts**

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. The Presentation Contexts proposed by the ELEVA DI AE for Export Images are defined in Table 8 .

**Table 8: Proposed Presentation Contexts for Export Images , NON PRO Mode**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	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
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	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
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	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
Specialized X-Ray	1.3.46.670589.2.3.1.1	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

#### 4.2.1.3.1.3 SOP Specific Conformance for SOP Classes

Important remarks about the exported images:

- In case the remote system does not support modality specific image storage SOP class, the ELEVA DI AE will convert the images, only in the NON PRO Mode, and exports them via the Secondary Capture image storage SOP class. These Secondary Capture images and additional information (like Shutter information, Graphics, Annotations text and other important attribute information) are burnt-in.  
The original bit depth of the Secondary Capture image is kept.  
Note: only the standard DICOM RF images can be converted, the private SOP class cannot be converted.
- Attributes e.g. Study Date and Study Time will be added to images to be exported (if not yet present). This is done because there are imaging systems relying on the existence of these attributes.
- The ELEVA DI AE allows the operator to modify attributes of the stored images. ELEVA DI AE does not modify the pixel values of the stored images. Modified images retain their original Study, Series and Image UID.
- For Secondary Capture images only one Window Width and Window Centre value is exported.
- Please refer to section 8.1.3, Coerced / Modified fields, for more information on stored images.
- When the location of a Graphic or text Annotation is specified relatively with regards to the displayed area. (i.e. DICOM attribute: Bounding Box Annotation Units, Anchor Point Annotation Units or Graphic Annotation Units equals "DISPLAY"), the annotation is not displayed.
- Areas occluded by shutter are always black in ELEVA DI AE, whereas it is possible to want it to be white in DICOM.
- On the export of such an image the ELEVA DI AE system first sets up an association to determine if the SCP supports the Grayscale Softcopy Presentation State SOP Class.  
If the SCP does not supports the Grayscale Softcopy Presentation State service the Graphical information is added to the image object additional a new instance UID is generated for this image.
- All kind of Images sending out from the are included with Performed Procedure Step Tags like: (Start Date, Start Time, ID ).

#### **Use of optional, private and retired attributes**

The transmitted Storage SOP instances may include all optional elements specified in the DICOM standard, depending on the source of the images.

The transmitted Storage SOP instances may contain Retired and Private data elements, depending on the ELEVA DI AE configuration.

The ELEVA DI AE can convert the transfer syntax when exporting images. The ELEVA DI AE can perform a transfer syntax according to the following table.

**Table 9: Transfer Syntax Conversion**

Syntax	Source	ILE	ELE	EBE
Destination	/			
ILE		+	+	+
ELE		+	+	+
EBE		+	+	+

The Store Response Status is saved in the log file; a user error will be displayed in the GUI.

The ELEVA DI AE will stop the transfer of the images and release the association as soon as it receives an unsuccessful Store Response Status.

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

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

**Table 10: DICOM Command Response Status Handling Behavior**

Service Status	Further Meaning	Behavior
Flag	Export Flagged image	Examination Flagged for DICOM export
Busy	Export Busy	Examination being exported
Done	Export Done	Examination exported successfully
Error	Export Error	Export Error while exporting examination
Cancel	Export Cancel	Export of Examination being Cancelled
Not Exported	Not Exported Export	Export of examination cancelled

**Table 11: DICOM Command Communication Failure Behavior**

Exception	Behavior
ARTIM Time-out	The store job fails in case of association setup. The reason is logged and reported to the user.
Reply Time-out	The store job fails and the association is aborted. The reason is logged and reported to the user.
Association Time-out SCU	The association is released.
Association aborted	The store job fails. The reason is logged and reported to the user.

**4.2.2 ELEVA EXAMINATION CONTROL AE**

The ELEVA Examination Control Application Entity (ELEVA EEC AE) provides Standard Conformance to the following DICOM 3.0 SOP classes as an SCU specified in the Table 12

**4.2.2.1 Supported SOP Classes by the ELEVA DI AE as SCU.**

This Application Entity provides extended Standard Conformance to the SOP classes Specified in the next Table.

**Table 12: Query Supported SCU SOP Classes by the ELEVA Examination Control AE**

SOP Class Name	UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3

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

**4.2.2.2 Association Policies**

This section shall contain a description of the General Association Establishment and Acceptance policies of the AE.

**4.2.2.2.1 General**

The ELEVA Examination Control offers unrestricted max. PDU size on associations initiated by ELEVA Examination Control. The PDU size is also configurable per remote station.

The DICOM standard application context shall be specified.

**Table 13: DICOM Application Context**

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

**4.2.2.2.2 Number of Associations**

The maximum number of simultaneous associations is by default unlimited, but the maximum can be limited via the configuration repository.

**4.2.2.2.3 Asynchronous Nature**

The ELEVA Examination Control does not support asynchronous operations and will not perform asynchronous window negotiation.

#### 4.2.2.2.4 Implementation Identifying Information

Following Implementation Class UID and Version Name are defined for the ELEVA Examination Control.

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

#### 4.2.2.2.5 Association Acceptance Policy

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

#### 4.2.2.2.6 Association Initiation Policy

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

### 4.2.2.3 Real – World Activity – Management Worklist (MWL) – FIND

#### 4.2.2.3.1 Association 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
- Patient Name
- Patient ID
- Request ID
- Accession Number
- Exam Date
- Modality

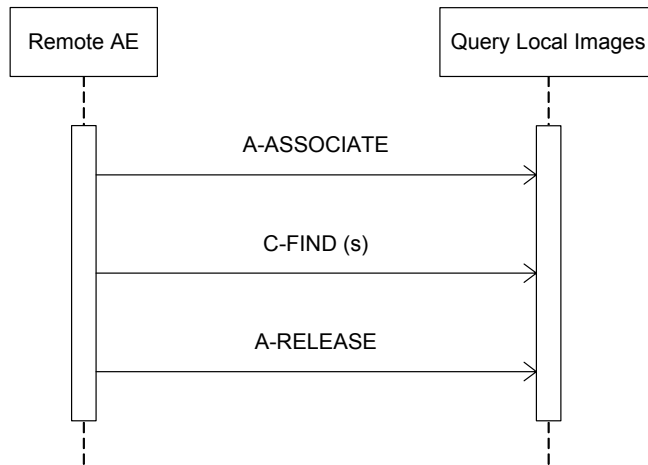
Each of the matching keys is optional. The association will be closed on reception of the last C-FIND response. The Worklist Query result is displayed in the Patient List. The query is interruptible if it was triggered by the user.

#### 4.2.2.3.2 Description and Sequencing of Activities

This RWA may be initiated in two ways.

1. After clicking the Query Worklist button the ELEVA Examination Control AE shall request an association with the configured remote Basic Worklist Management SCP. When the association is accepted the ELEVA Examination Control AE shall send the Broad Query find request, wait for response, and then release the association.

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



**Figure 5: Sequencing of RWA Query Worklist**

**4.2.2.3.3 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 14: 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", "Tomorrow"
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. 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 15: Matching Keys for Patient Query**

Matching Keys for Patient Query			
Attribute Name	Tag	Note	Wildcard Search ( using " * " only )
Patient's Name	0010,0010	Identified from admission form.	Yes
Patient ID	0010,0020	Identified from admission form.	Yes
Accession Number	0008,0040	Identified from admission form.	Yes
Requested Procedure ID	0040,1001	Identified from admission form.	Yes
Scheduled Station AE Title	0040,0001		Yes
Modality (type)	0008,0060	" * ", "CR", "OT", "XA", "RF", "DX", "US"	Yes
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>	No

**Wildcard search (using " \* " only) is supported for:**

- "Patient's Name",
- "Patient ID",
- "Accession Number",
- "Requested Procedure ID",
- "Scheduled Station AE Title".
- "Modality"

The Patient Query can be cancelled after the user has pressed a "Cancel" Button on the User Interface. In this case the DICOM association will be aborted immediately. As the query is performed asynchronously, intermediate results are displayed in the meantime.

#### 4.2.2.3.3.1 Patient and Study Merge

The ELEVA DI looks in its internal database, of the ELEVA Examination Control, for a Study with the same Study Instance UID (0020,000D) as given in the Scheduled Procedure Step (SPS).

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.

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

If the internal database of the ELEVA DI Examination Control 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 internal database of the ELEVA DI Examination Control 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.

#### 4.2.2.4 Modality Worklist Information Model – FIND SOP Class

This Chapter specifies in detail the applied attributes in the C-FIND Service Elements of this supported SOP Class.

The below tables should be read as follows:

Module name:	The name of the associated module for supported worklist attributes. The module name is written behind the table number.
Attribute name:	Attributes supported to build an Panorama Modality Worklist Request Identifier.
Tag:	DICOM tag for this attribute.
VR:	DICOM VR for this attribute.
M:	Matching Keys for (automatic) Worklist Update: -> "S" will indicate an attribute value for Single Value Matching, -> "R" will indicate an attribute value for Range Matching, -> "W" will denote Wildcard Matching (* and ?) and -> "U" will indicate an attribute for Universal Matching
R:	Return Keys. An "x" will indicate that 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 this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.

**Table 16: Modules of the Modality Worklist Information Model – FIND SOP Class**

Information Entity	Module Name	Usage
General	SOP Common Module	ALWAYS
Study	Scheduled Procedure Step Module	ALWAYS
	Requested Procedure Module	ALWAYS
	Imaging Service Request Module	ALWAYS
Visit	Visit Identification Module	ALWAYS
	Visit Status Module	ALWAYS
	Patient Identification Module	ALWAYS
	Patient Demographic Module	ALWAYS
	Patient Medical Module	ALWAYS

**Table 17: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – SOP Common Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Specific Character Set	0008,0005	CS		X			

**Table 18: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Identifier Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Patient's Name	0010,0010	PN	S,W,U			X	
Patient ID	0010,0020	LO	S,U			X	
Other Patient ID's	0010,1000	LO		X		X	

**Table 19: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Demographic Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Patient's Birth Date	0010,0030	DA		X		X	
Patient's Sex	0010,0040	CS		X			
Patient's Size	0010,1020	DS		X			
Patient's Weight	0010,1030	DS					
Ethnic Group	0010,2160	SH				X	
Patient Comments	0010,4000	LT				X	

**Table 20: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Medical Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Medical Alerts	0010,2000	LO		X		X	
Contrast Allergies	0010,2110	LO		X		X	
Additional Patient History	0010,21B0	LT		X		X	
Pregnancy Status	0010,21C0	US		X		X	

**Table 21: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Visit Status Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Current Patient Location	0038,0300	LO		X			

**Table 22: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Schedule Procedure Step Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Scheduled Procedure Step Sequence	0040,0100	SQ		X			
>Modality	0008,0060	CS		X			
>Requested Contrast Agent	0032,1070	LO		X			
>Scheduled AE Title	0040,0001	AE		X			
>Scheduled Procedure Step Start Date	0040,0002	DT		X			
>Scheduled Procedure Step Start Time	0040,0003	TM		X			
>Scheduled Procedure Step End Date	0040,0004	DT		X			
>Scheduled Procedure Step End Time	0040,0005	TM		X			
>Scheduled Performing Physician's Name	0040,0006	PN		X			
>Scheduled Procedure Step Description	0040,0007	LO		X			
>Scheduled Action Item Code Sequence	0040,0008	SQ		X			
>>Code Value	0008,0100	SH		X		X	
>>Coding Scheme Designator	0008,0102	SH		X			
>>Coding Scheme Version	0008,0103	SH		X			
>>Code Meaning	0008,0104	LO		X			
>Scheduled Procedure Step ID	0040,0009	SH		X			
>Scheduled Station Name	0040,0010	SH		X			
>Scheduled Procedure Step Location	0040,0011	SH		X			
>Pre-Medication	0040,0012	LO		X			
>Scheduled Procedure Step Status	0040,0020	CS		X			
>Comments on the Scheduled Procedure Step	0040,0400	LT		X			

**Table 23: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Requested Procedure Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Referenced Study Sequence	0008,1110	SQ		X			
>Referenced SOP Class UID	0008,1150	UI		X			
>Referenced SOP Instance UID	0008,1155	UI		X			
Study Instance UID	0020,000D	UI		X			
Requested Procedure Description	0032,1060	LO		X			
Requested Procedure Code Sequence	0032,1064	SQ		X			
>Code Value	0008,0100	SH		X		X	
>Coding Scheme Designator	0008,0102	SH		X			
>Coding Scheme Version	0008,0103	SH		X			
>Code Meaning	0008,0104	LO		X			
Requested Procedure ID	0040,1001	SH		X		X	
Patient Transport Arrangements	0040,1004	LO		X			
Names of Intended Recipients of Results	0040,1010	PN		X		X	
Requested Procedure Comments	0040,1400	LT		X			

**Table 24: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Imaging Service Request Module (M)**

Attribute Name	Tag	VR	M	R	Q	D	IOD
Accession Number	0008,0050	SH O		X		X	
Referring Physician's Name	0008,0090	PN		X		X	
Requesting Physician	0032,1032	PN		X		X	
Requesting Service	0032,1033	LO		X		X	
Imaging Service Request Comments	0040,2400	LT		X			

**4.2.2.4.1.1 Proposed Presentation Contexts**

ELEVA Examination Control Application Entity (EEC AE) will propose the presentation contexts as given in the next table.

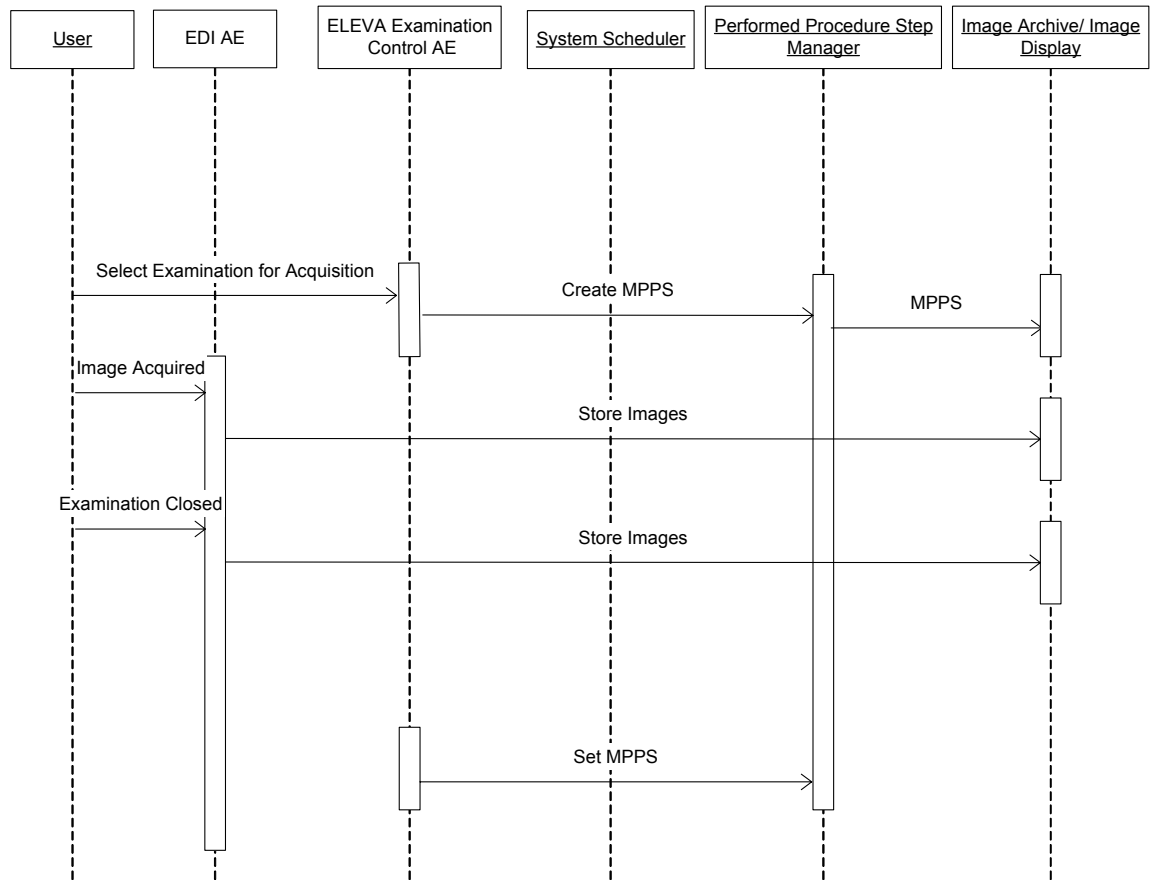
**Table 25: Proposed Presentation Contexts for ELEVA DI Examination Control MWL SCU**

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 the preferred Transfer syntax

4.2.2.5 Real-World Activity –Modality Performed Procedure Step (MPPS)

4.2.2.5.1 Association Real – World Activity



An ELEVA DI “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 may not be re-opened after having been closed, and each examination workflow context is enclosed in one **MPPS**, one examination may result in 0:1 MPPS instances.

However, image archiving after the examination’s closure leads to 1:n MPPS instances per examination (append case).

An initial MPPS **IN PROGRESS** message with N-CREATE is sent once the first X-ray Radiation has been released. The system does not generate intermediate MPPS IN PROGRESS messages for subsequent acquisitions of this Scheduled Procedure Step / Examination instance.

After the Examination has been closed by the user, the system will change the MPPS status of the related examination to “COMPLETED” and generate a MPPS **COMPLETED** message by N-SET. The examination cannot be reopened. ELEVA DI also generates MPPS messages for unscheduled examinations.

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

The user might cancel an unclosed examination at any time. Depending on state of examination and MPPS related system configuration, an MPPS IN PROGRESS message might be already sent (discontinued case) or not (abandoned case). If not, (abandoned case) the system generates an MPPS IN PROGRESS message. In both cases it sends then a MPPS **DICONTINUED** message. The reason for abandoning or discontinuing a procedure step is unspecified.

#### 4.2.2.5.1.1 Sequencing of Performed Procedure Steps

The performed sequence order of scheduled procedure steps may be interchanged by the user.

#### 4.2.2.5.1.2 Interleave of Performed Procedure Steps

MPPS messages may interleave. Depending on the application workflow optimization by the user, an MPPS sequence like this may come up:

```
MPPS / Inst UID 1: N_CREATE / IN PROGRESS
MPPS / Inst UID 2: N_CREATE / IN PROGRESS
MPPS / Inst UID 3: N_CREATE / IN PROGRESS
...
MPPS / Inst UID 2: N_SET / COMPLETED
MPPS / Inst UID 1: N_SET / COMPLETED
MPPS / Inst UID 3: N_SET / COMPLETED
```

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

#### 4.2.2.5.2 Presentation Context Table

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

**Table 26: Proposed Presentation Context for the Verification by the RIS AE**

Abstract Syntax	UID	Transfer Syntax	UID List	Role	Ext. Neg.
MPPS	1.2.840.10008.3.1.2.3.3	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: For Modality Performed Procedure Step, ELE is preferred.*

#### 4.2.2.5.3 SOP Specific Conformance

ELEVA Examination Control by default derives the specific acquisition protocol from the Scheduled Protocol Code Sequence Items.

If this Sequence contains more than one Protocol Code, these codes will be displayed as separate examinations on the UI, but will be handled by one common MPPS instance.

ELEVA Examination Control 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

The Evaluated Attributes of the ELEVA Examination Control are:

Evaluated Attributes of the ELEVA Examination Control			
Attribute Name	Tag	Evaluated	Note
Coding Scheme Version	0008,0103	No	
Coding Scheme Designator	0008,0102	No	
Code Meaning	0008,0104	No	
Code Value	0008,0100	Yes	for mapping the examination settings

That is, ELEVA Examination Control expects, that any used Code Value is unique (unambiguous) within a given RIS domain.

The number of items in the Scheduled Protocol Code Sequence accepted by the ELEVA Examination Control is not limited.

**Table 27: MPPS SOP Class - N-CREATE-RQ - SOP Common Module**

Attribute Name	Tag	VR	Note
Specific Character Set	0008,0005	CS	ISO_IR 100
SOP Class UID	0008,0016	UI	1.2.840.10008.3.1.2.3.3
SOP Instance UID	0008,0018	UI	

**Table 28: MPPS SOP Class - N-CREATE-RQ - Image Acquisition Results Module**

Attribute Name	Tag	VR	Note
Modality	0008,0060	CS	Applied Value: RF
Study ID	0020,0010	SH	If scheduled: Req. Procedure ID, else: equipment generated Study identifier
Performed Action Item Code Sequence	0040,0260	SQ	0 length
>Code Value	0008,0100	SH	
>Coding Scheme Designator	0008,0102	SH	
>Coding Scheme Version	0008,0103	SH	
>Code Meaning	0008,0104	LO	
Performed Series Sequence	0040,0340	SQ	
>Retrieve AE Title	0008,0054	AE	
>Series Description	0008,103E	LO	
>Performing Physician's Name	0008,1050	PN	
>Operators' Name	0008,1070	PN	
>Referenced Image Sequence	0008,1140	SQ	
>>Referenced SOP Class UID	0008,1150	UI	Uniquely identifies the referenced SOP Class. This attribute is only used only if Images may be retrieved as Single Image SOP Classes.
>>Referenced SOP Instance UID	0008,1155	UI	Uniquely identifies the referenced SOP Instance. This attribute is only used only if Images may be retrieved as Single Image SOP Classes.
>Protocol Name	0018,1030	LO	
>Series Instance UID	0020,000E	UI	
>Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ	
>>Referenced SOP Class UID	0008,1150	UI	
>>Referenced SOP Instance UID	0008,1155	UI	

**Table 29: MPPS SOP Class - N-CREATE-RQ – Performed Procedure Step Information Module**

Attribute Name	Tag	VR	Note
Procedure Code Sequence	0008,1032	SQ	
>Code Value	0008,0100	SH	
>Coding Scheme Designator	0008,0102	SH	
>Coding Scheme Version	0008,0103	SH	
>Code Meaning	0008,0104	LO	
>Mapping Resource	0008,0105	CS	
>Context Group Version	0008,0106	DT	
>Context Group Local Version	0008,0107	DT	
>Code Set Extension Flag	0008,010B	CS	Applied Value(s): N, Y
>Context Group Extension Creator UID	0008,010D	UI	
>Context Identifier	0008,010F	CS	
Performed Station AE Title	0040,0241	AE	
Performed Station Name	0040,0242	SH	0 length
Performed Location	0040,0243	SH	0 length
Performed Procedure Step Start Date	0040,0244	DA	
Performed Procedure Step Start Time	0040,0245	TM	
Performed Procedure Step End Date	0040,0250	DA	0 length
Performed Procedure Step End Time	0040,0251	TM	0 length



Attribute Name	Tag	VR	Note
Performed Procedure Step Status	0040,0252	CS	Applied Value(s): COMPLETED, DISCONTINUED, IN PROGRESS
Performed Procedure Step ID	0040,0253	SH	
Performed Procedure Step Description	0040,0254	LO	0 length
Performed Procedure Type Description	0040,0255	LO	0 length

**Table 30: Proposed MPPS SOP Class - N-CREATE-RQ – Performed Procedure Step Relationship Module**

Attribute Name	Tag	VR	Note
Referenced Patient Sequence	0008,1120	SQ	
>Referenced SOP Class UID	0008,1150	UI	Uniquely identifies the referenced SOP Class. Required if Referenced Patient Sequence (0008:1200) is sent. Applied Value(s): 1.2.840.10008.3.1.2.1.1
>Referenced SOP Instance UID	0008,1155	UI	Uniquely identifies the referenced SOP Instance. Required if Referenced Patient Sequence (0008:1120) is sent.
Patient's Name	0010,0010	PN	
Patient ID	0010,0020	LO	
Patient's Birth Date	0010,0030	DA	
Patient's Sex	0010,0040	CS	
Scheduled Step Attribute Sequence	0040,0270	SQ	
>Accession Number	0008,0050	SH	
>Referenced Study Sequence	0008,1110	SQ	0 length if unscheduled
>>Referenced SOP Class UID	0008,1150	UI	
>>Referenced SOP Instance UID	0008,1155	UI	
>Study Instance UID	0020,000D	UI	
>Requested Procedure Description	0032,1060	LO	
>Scheduled Procedure Step Description	0040,0007	LO	
>Scheduled Protocol Code Sequence	0040,0008	SQ	
>>Code Value	0008,0100	SH	
>>Coding Scheme Designator	0008,0102	SH	
>>Coding Scheme Version	0008,0103	SH	
>>Code Meaning	0008,0104	LO	
>>Mapping Resource	0008,0105	CS	
>>Context Group Version	0008,0106	DT	
>>Context Group Local Version	0008,0107	DT	
>>Code Set Extension Flag	0008,010B	CS	Applied Value(s): N, Y
>>Context Group Extension Creator UID	0008,010D	UI	
>>Context Identifier	0008,010F	CS	
>Scheduled Procedure Step ID	0040,0009	SH	
>Requested Procedure ID	0040,1001	SH	

**Table 31: MPPS SOP Class - N-CREATE-RQ - Radiation Dose Module**

Attribute Name	Tag	VR	Note
Image Area Dose Product	0018,115E	DS	See Note
Total Number of Exposures	0040,0301	US	See Note
Total Time Of Fluoroscopy	0040,0300	US	See Note
Entrance Dose	0040,0302	US	See Note

*Note: Not sent in case of appended MPPS instances*

### All Supported N-SET-RQ Models:

**Table 32: MPPS SOP Class - N-SET-RQ - Sop Common Module**

Attribute Name	Tag	VR	Note
SOP Class UID	0008,0016	UI	
SOP Instance UID	0008,0018	UI	

**Table 33: MPPS SOP Class - N-SET-RQ - Image Acquisition Results Module**

Attribute Name	Tag	VR	Note
Performed Protocol Code Sequence	0040,0260	SQ	1 item only
>Code Value	0008,0100	SH	
>Coding Scheme Designator	0008,0102	SH	
>Code Meaning	0008,0104	SH	
Performed Series Sequence	0040,0340	SQ	One or more items
>Retrieve AE Title	0008,0054	AE	Zero length
>Series Description	0008,103E	LO	Zero length
>Performing Physician's Name	0008,1050	PN	Zero length
>Operator's Name	0008,1070	PN	Name(s) of the operator(s)
>Referenced Image Sequence	0008,1140	SQ	In Non-Tomo Examinations 1 item only. In Tomo-Examinations N items. Missing after conventional acquisition.
>>Referenced SOP Class UID	0008,1150	UI	Presently only RF class
>>Referenced SOP Instance UID	0008,1155	UI	
>Protocol Name	0018,1030	LO	Copy of Performed Protocol Code Sequence -> Code Value
>Series Instance UID	0020,000E	UI	
>Referenced Standalone SOP Instance Sequence	0040,0220	SQ	Zero length

**Table 34: MPPS SOP Class - N-SET-RQ - Performed Procedure Step Information Module**

Attribute Name	Tag	VR	Note
Procedure Code Sequence	0008,1032	SQ	
>Code Value	0008,0100	SH	
>Coding Scheme Designator	0008,0102	SH	
>Coding Scheme Version	0008,0103	SH	
>Code Meaning	0008,0104	LO	
Performed Procedure Step End Date	0040,0250	DA	
Performed Procedure Step End Time	0040,0251	TM	
Performed Procedure Step Status	0040,0252	CS	Applied Value(s): COMPLETED, DISCONTINUED
Performed Procedure Step Description	0040,0254	LO	Zero length
Performed Procedure Type Description	0040,0255	LO	

**Table 35: MPPS SOP Class - N-SET-RQ - Radiation Dose Module**

Attribute Name	Tag	VR	Note
Image Area Dose Product	0018,115E	DS	Not accumulating: re-processed images, non-digital images. See Note
Total Number of Exposures	0040,0301	US	Not counting: re-processed images. See Note
Total Time Of Fluoroscopy	0040,0300	US	See Note
Entrance Dose	0040,0302	US	See Note

*Note: Not sent in case of appended MPPS instances*

## 4.3 NETWORK INTERFACES

### 4.3.1 Physical Network Interface

The ELEVA DI System (ELEVA DI AE and the ELEVA Examination Control AE) application provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of [DICOM].

ELEVA DI System inherits its TCP/IP stack from Windows XP (i.e. the operating system platform).

ELEVA DI System supports a single network interface: Ethernet ISO.8802-3. With standard supported physical medium include:

- IEEE 802.3 10BASE-TX
- IEEE 802.3 100BASE-TX (Fast Ethernet)
- IEEE 802.3 1000BASE-X (Fiber Optic Gigabit Ethernet).

## 4.4 CONFIGURATION

The ELEVA DI (Ditto) system is configured by means of a configuration program. This program is accessible at start-up of the ELEVA DI (Ditto) system. It is password protected and intended to be used by Philips Customer Support Engineers only.

The configuration program shall prompt the Customer Support Engineer to enter configuration information as required by the ELEVA DI (Ditto) application.

### 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 shall be described in this section.

#### 4.4.1.1 Local AE Titles

The ELEVA DI System exits of two Application Entity titles and two IP addresses. One for the ELEVA Examination Control AE and one for the ELEVA DI AE. At installation the Customer Support Engineer can change the ELEVA Examination Control AE host name. The ELEVA DI AE can be changed independently.

**ELEVA DI (Ditto) AE** listens to a independently changed port number.

**Table 36: AE Title Configuration Table**

Application Entity	Default AE Title	Default TCP/IP Port
ELEVA DI AE	<IP host name>	Configurable.
ELEVA Examination Control AE	<IP host name EEC>	Configurable

### 4.4.1.2 Remote AE Title/Presentation Address Mapping

#### 4.4.1.2.1 Remote Association Initiators

All relevant remote applications able to setup a DICOM association towards ELEVA DI (Ditto) AE and ELEVA Examination Control must be configured at ELEVA DI (Ditto) System configuration time.

The Customer Support Engineer (CSE) must provide the following information for each remote application:

- The **Application Entity Title**.
- The **SOP Classes** and **Transfer Syntaxes** for which ELEVA DI (Ditto) AE accepts associations.

#### 4.4.1.2.2 Remote Association Acceptors

The following information must be provided for all relevant remote applications that are able to accept DICOM associations from ELEVA DI (Ditto) System:

- The **Application Entity Title**.
- The **Host name / IP address** on which the remote application resides.
- The **Port number** at which the remote application accepts association requests.

#### 4.4.2 Parameters

The specification of important operational parameters, and if configurable, their default value and range, shall be specified here.

The configuration parameters like SOP Classes and Transfer Syntaxes to be used are given in Table 3.

The configuration parameters are given in

Table 37, categorized in the following sections:

- General Parameters of ELEVA DI (Ditto) System.
- Local Configurable Parameters of the ELEVA DI System.
- Remote Configurable Parameters of the ELEVA DI System.

**Table 37: Configuration Parameters table**

Parameter	Configurable	Default Value
<b>General Parameters of ELEVA DI (Ditto) System</b>		
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	-
General DIMSE level time-out values	No	-
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	No	-
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	-
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	-
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	-
<b>Local Configurable Parameters of the ELEVA DI (Ditto) System</b>		
Size constraint in maximum object size (see note)	No	-
Maximum PDU size the AE can receive	Yes	28 K Bytes
Maximum PDU size the AE can send	No	28 K Bytes
AE specific DIMSE level time-out values	No	-
Number of simultaneous associations by Service and/or SOP class	No	-
SOP class support	Yes	none
Transfer Syntax support	Yes	ELE

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Parameter	Configurable	Default Value
<b>Remote Configurable Parameters of the ELEVA DI (Ditto) System</b>		
Size constraint in maximum object size (see note)	No	-
Maximum PDU size the AE can receive	Yes	0 (unlimited)
Maximum PDU size the AE can send	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous associations by Service and/or SOP class	No	-
SOP class support	Yes	none
Transfer Syntax support	Yes	ELE
Automatic conversion of images of SOP classes not supported by remote systems into Secondary Capture Image Storage SOP instances	Yes	convert to SC
Export of pure DICOM images (i.e. only the standard DICOM attributes as defined in the related IOD) or extended DICOM images (with additional Standard DICOM, Private and Retired attributes)	Yes	allow all attributes

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## **5 MEDIA INTERCHANGE**

None.

### **5.1 Augmented and Private Application Profiles**

None.

#### **5.1.1 Augmented Application Profiles**

None.

#### **5.1.2 Private Application Profiles**

None.



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## 6 SUPPORT OF CHARACTER SETS

When the ELEVA DI System receives a Worklist with undefined character set then the import will be terminated with error status code.

The ELEVA DI System supports the extended character set ISO IR 100, which is the Latin alphabet No 1, supplementary set.

The following non-printable characters (Hexa-decimal coded) are not supported for the DI Image Export function in the received Worklist data:

00H through 1FH,  
7FH  
80H through 9FH,  
A0H, A6H, A8H, A9H, AAH, AEH  
B1H, B4H, B8H, B9H, BEH  
C0H, C1H, C2H, C3H, C8H, CAH, CBH, CCH, CDH, CEH, CFH  
D0H, D2H, D3H, D4H, D5H, D9H, DAH, DBH, DDH, DEH  
E3H  
F0H, F5H, FDH, FEH

When these characters are used in information that is shown on the DI Monitor of the ELEVA DI System or local hardcopy, they will be displayed as DI proprietary graphical symbols.

If one or more of these non-printable characters are present in the strings of received Worklist data, the string is not accepted.

If non-printable characters are present in the Patient's Name or if this attribute is empty, the worklist entry is not accepted.

In case the Patient's Name only contains spaces, this Worklist entry and all succeeding Worklist entries will be skipped.

The Default Factory Settings for the WLM query request attribute "Specific Character set (0008,0005)" is "NO" and should be configured to support the 27H Character.

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## 7 SECURITY

### 7.1 Security Profiles

None supported.

### 7.2 Association level security

None supported.

### 7.3 Application level security

The ELEVA DI System does not supports the HIPAA Audit trail profile.

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## 8 ANNEXES

### 8.1 IOD Contents

- This section specifies each IOD created by the ELEVA DI.
- X-Ray RadioFluoroscopic Image by the ELEVA DI AE, section 8.1.1.1
- Grayscale Softcopy Presentation State Object by the ELEVA DI AE, section 8.1.1.4
- Secondary Capture Object by the ELEVA DI AE, section 8.1.1.2
- SPECIALIZED PMS X-Ray Object by the ELEVA DI AE, section 8.1.1.3

#### 8.1.1 Created SOP Instances by the ELEVA DI

This section specifies each IOD created by the **ELEVA DI**

**Used abbreviations are:**

**Used Presentation Values:**

ALWAYS the module or attribute shall always be present with value  
ANAP Attribute Not Always Present  
VNAP Value Not Always Present (attribute sent zero length if no value is present)  
EMPTY Attribute is sent without a value  
MAYBE the module may be present under specified condition  
OPTIONAL the module may be available, depending on source object

**Used Source Items:**

AUTO the attribute value is generated automatically  
CONF the attribute value source is a configurable parameter  
IMPL the attribute value source is a user-implicit configuration setting  
MPPS the attribute value source is a Modality Performed Procedure Step  
MWL the attribute value source is a Modality Worklist  
SPEC the attribute value source is a specific DICOM object  
USER the attribute value source is explicit user input

### 8.1.1.1 X-Ray RadioFluoroscopic SOP Class for the ELEVA DI and ELEVA DITTO

The following tables give a detailed overview of all supported attributes of the XRF 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.

**Table 38: Modules of the Created X-Ray RadioFluoroscopic Image Storage SOP Class by the ELEVA DI**

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 39	ALWAYS
Study	General Study Module	Table 40	ALWAYS
Series	General Series Module	Table 42	ALWAYS
Equipment	General Equipment Module	Table 41	ALWAYS
	Image Pixel Module	Table 44	ALWAYS
	General Image Module	Table 43	ALWAYS
	XRF Image Module	Table 48	ALWAYS
	Display Shutter	Table 47	OPTIONAL
	X-Ray Acquisition Module	Table 49	ALWAYS
	SOP Common Module	Table 46	ALWAYS
	VOI LUT Module	Table 45	OPTIONAL

**Table 39: XRF Image Storage SOP Class - Patient Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN	Received from RIS or Entered by Operator	VNAP	AUTO
Patient ID	0010,0020	LO	Received from RIS or Entered by Operator	VNAP	AUTO
Patient's Birth Date	0010,0030	DA	Received from RIS or Entered by Operator	VNAP	AUTO
Patient's Sex	0010,0040	CS	Received From RIS or Entered by Operator. F,M,O	VNAP	AUTO

**Table 40: XRF Image Storage SOP Class - General Study Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	0020,000D	UI	Generated at the creation of the study or received from RIS.	ALWAYS	AUTO
Study Date	0008,0020	DA		VNAP	AUTO
Study Time	0008,0030	TM		VNAP	AUTO
Accession Number	0008,0050	SH	Zero length if not received from RIS	VNAP	AUTO
Referring Physician's Name	0008,0090	PN	Zero length if not received from RIS	VNAP	AUTO
Study Description	0008,1030	LO		VNAP	AUTO
Study ID	0020,0010	SH	Undefined	VNAP	AUTO

**Table 41: XRF Image Storage SOP Class – General Equipment Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	VNAP	AUTO
Institution Name	0008,0080	LO	Hospital	ANAP	AUTO
Station Name	0008,1010	SH	Eleva	ANAP	AUTO
Manufacturer's Model Name	0008,1090	LO	Digital Imaging	ANAP	AUTO
Device Serial Number	0018,1000	LO		ANAP	AUTO
Software Versions	0018,1020	LO	DSI R2.1.1 LUT 04-01-02 R6.1.3.0119 for DITTO, or DSI R1.2.2 LUTPROM 04- 04-06 R6.1.3 for DI	ANAP	AUTO

**Table 42: XRF Image Storage SOP Class - General Series Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA		ANAP	AUTO
Series Time	0008,0031	TM		ANAP	AUTO
Modality	0008,0060	CS	RF	ALWAYS	AUTO
Performing Physicians' Name	0008,1050	PN	Received from RIS, entered by user or is empty if not known.	ANAP	AUTO
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO
> Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.5.1.4.1.1.12.2	ALWAYS	AUTO
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Protocol Name	0018,1030	LO		ANAP	AUTO
Series Instance UID	0020,000E	UI		ALWAYS	CONF
Series Number	0020,0011	IS		VNAP	AUTO
Laterality	0020,0060	CS	Always zero length value.	MAYBE	AUTO
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO
> Scheduled Procedure Step	0040,0009	SH		ALWAYS	AUTO
> Requested Procedure	0040,1001	SH		ALWAYS	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	AUTO
>> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO
>> Code Meaning	0008,0104	LO		ALWAYS	AUTO

**Table 43: XRF Image Storage SOP Class - General Image Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Date	0008,0022	DA		ANAP	AUTO
Content Date	0008,0023	DA		MAYBE	AUTO
Acquisition Time	0008,0032	TM		ANAP	AUTO
Content Time	0008,0033	TM		MAYBE	AUTO
Acquisition Number	0020,0012	IS		ANAP	AUTO
Instance Number	0020,0013	IS		VNAP	AUTO
Patient Orientation	0020,0020	CS		MAYBE	AUTO
Image Comments	0020,4000	LT	Contains also the DI or DITTO image annotations on normal (i.e. non zoomed) images in the format --(x,y) text --. is not present if not entered by user and if no annotations are present.	ANAP	AUTO

**Table 44: XRF Image Storage SOP Class - Image Pixel Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Row	0028,0010	US	1024, 512	ALWAYS	AUTO
Columns	0028,0011	US	1024, 512	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

**Table 45: XRF Image Storage SOP Class – VOI LUT Module (O)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	0028,1050	DS	is related to the DI Contrast /Brightness.	ANAP	AUTO
Window Width	0028,1051	DS	is related to the DI Contrast /Brightness.	ANAP	AUTO

**Table 46: XRF Image Storage SOP Class – SOP Common Module(M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	AUTO
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.12.2	ANAP	AUTO
SOP Instance UID	0008,0018	UI		ANAP	AUTO

**Table 47: XRF Image Storage SOP Class –Display Shutter Module (O)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shutter Shape	0018,1600	CS	CIRCULAR RECTANGULAR	ALWAYS	USER
Shutter Left Vertical Edge	0018,1602	IS		ANAP	USER
Shutter Right Vertical Edge	0018,1604	IS		ANAP	USER
Shutter Upper Horizontal Edge	0018,1606	IS		ANAP	USER
Shutter Lower Horizontal Edge	0018,1608	IS		ANAP	USER
Center of Circular Shutter	0018,1610	IS		ANAP	USER
Radius of Circular Shutter	0018,1612	IS		ANAP	USER

**Table 48: XRF Image Storage SOP Class – X-Ray Image Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	CS	ORIGINAL, PRIMARY, SINGLE PLANE	ALWAYS	AUTO
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO
Bits Stored	0028,0101	US	8	ALWAYS	AUTO
High Bit	0028,0102	US	7	ALWAYS	AUTO
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO
Pixel Intensity Relationship	0028,1040	CS	DISP	ALWAYS	AUTO

**Table 49: XRF Image Storage SOP Class – X-Ray Acquisition Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	0018,0060	DS	Always zero length value.	VNAP	AUTO
Exposure	0018,1152	IS		MAYBE	AUTO
Radiation Setting	0018,1155	CS	GR, SC	ALWAYS	AUTO

### 8.1.1.2 Secondary Capture SOP Class for the ELEVA DI and ELEVA DITTO

The following tables give a detailed overview of all supported attributes of the SC 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.

**Table 50: Modules of the Created Secondary Capture Storage SOP Class by the ELEVA DI**

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 51	ALWAYS
Study	General Study Module	Table 52	ALWAYS
Series	General Series Module	Table 54	ALWAYS
Equipment	General Equipment Module	Table 56	OPTIONAL
	SC Equipment Module	Table 53	ALWAYS
Image	General Image Module	Table 55	ALWAYS
	Image Pixel Module	Table 57	ALWAYS
	SC Image Module	Table 58	ALWAYS
	VOI LUT Module	Table 59	OPTIONAL
	SOP Common Module	Table 60	OPTIONAL

**Table 51: SC Image Storage SOP Class - Patient Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN	Received from RIS or Entered by Operator	VNAP	AUTO
Patient ID	0010,0020	LO	Received from RIS or Entered by Operator	VNAP	AUTO
Patient's Birth Date	0010,0030	DA	Received from RIS or Entered by Operator	VNAP	AUTO
Patient's Sex	0010,0040	CS	Received from RIS or Entered by Operator	VNAP	AUTO

**Table 52: SC Image Storage SOP Class - General Study Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA		ALWAYS	AUTO
Study Time	0008,0030	TM		ALWAYS	AUTO
Accession Number	0008,0050	SH	Zero length if not received from RIS	VNAP	AUTO
Referring Physician's Name	0008,0090	PN	Zero length if not received from RIS	VNAP	AUTO
Study Description	0008,1030	LO		VNAP	AUTO
Study Instance UID	0020,000D	UI	Generated at the creation of the study or received from RIS.	ALWAYS	AUTO
Study ID	0020,0010	SH	Undefined	VNAP	AUTO



**Table 53: SC Image Storage SOP Class –SC Equipment Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Conversion Type	0008,0064	CS	DV (Digitized Video)	ALWAYS	AUTO
Modality	0008,0060	CS	OT	VNAP	AUTO
Secondary Capture Device Manufacturer	0018,1016	LO	Philips Medical Systems	VNAP	AUTO
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO	Digital Imaging	VNAP	AUTO
Secondary Capture Device Software Version(s)	0018,1019	LO	DSI R2.1.1 LUT 04-01-02 R6.1.3.0119 for DI, or DSI R1.2.2 LUTPROM 04-04-06 R6.1.3 for DITTO	VNAP	AUTO

**Table 54: SC Image Storage SOP Class - General Series Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA		ANAP	AUTO
Series Time	0008,0031	TM		ANAP	AUTO
Protocol Name	0018,1030	LO		VNAP	AUTO
Performing Physicians' Name	0008,1050	PN	Received from RIS, entered by user or is empty if not known.	VNAP	USER
Series Instance UID	0020,000E	UI	Generated at creation of the series	ALWAYS	AUTO
Series Number	0020,0011	IS		ALWAYS	AUTO
Laterality	0020,0060	CS	Always zero length value.	VNAP	AUTO
Performed Procedure Step Start Date	0040,0244	DA	From MPPS	VNAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM	From MPPS	VNAP	AUTO
Performed Procedure Step Description	0040,0254	LO	From MPPS	VNAP	AUTO

**Table 55: SC Image Storage SOP Class - General Image Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Date	0008,0022	DA		ANAP	AUTO
Content Date	0008,0023	DA		MAYBE	AUTO
Acquisition Time	0008,0032	TM		ANAP	AUTO
Content Time	0008,0033	TM		MAYBE	AUTO
Acquisition Number	0020,0012	IS		ANAP	AUTO
Instance Number	0020,0013	IS	1-n	VNAP	AUTO
Patient Orientation	0020,0020	CS	Always zero length value.	MAYBE	AUTO
Image Comments	0020,4000	LT	Contains also the DI or DITTO 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.	ANAP	USER

**Table 56: SC Image Storage SOP Class - General Equipment Module (O)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufactory	0008,0070	LO	Philips Medical System	VNAP	AUTO

**Table 57: SC Image Storage SOP Class - Image Pixel Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO
Row	0028,0010	US	1024, 512	ALWAYS	AUTO
Columns	0028,0011	US	1024, 512	ALWAYS	AUTO
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO
Bits Stored	0028,0101	US	8	ALWAYS	AUTO
High Bit	0028,0102	US	7	ALWAYS	AUTO
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

**Table 58: SC Image Storage SOP Class – SC Image Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Date of Secondary Capture	0018,1012	DA		ANAP	AUTO
Time of Secondary Capture	0018,1014	TM		ANAP	AUTO

**Table 59: SC Image Storage SOP Class – VOI LUT Module (O)**

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

**Table 60: SC Image Storage SOP Class – SOP Common Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	AUTO
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ANAP	AUTO
SOP Instance UID	0008,0018	UI		ANAP	AUTO

### 8.1.1.3 SPECIALIZED PMS X-Ray SOP Class for the ELEVA DI and ELEVA DITTO

In the DI NON PRO MODE each RAW-Image exits of one Specialized PMS X-Ray Image and one Softcopy Presentation State PR.

The following tables give a detailed overview of all supported attributes of the Specialized PMS X-Ray 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.

**Table 61: Modules of the Created SPECIALIZED PMS X-Ray SOP Class by the ELEVA DI**

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 62	ALWAYS
Study	General Study Module	Table 63	ALWAYS
Series	General Series Module	Table 64	ALWAYS
Equipment	General Equipment Module		OPTIONAL
		Table 65	
Image	General Image Module	Table 66	ALWAYS
	Image Pixel Module	Table 67	ALWAYS
	X-Ray Image Module	Table 69	ALWAYS
	X-Ray Acquisition	Table 70	ALWAYS
	VOI LUT Module	Table 71	ALWAYS
	SOP Common Module	<b>Table 72</b>	ALWAYS
	XRF POSITIONER Module	<b>Table 73</b>	ALWAYS
	Display Shutter Module	Table 68	ALWAYS

**Table 62: Specialized PMS X-Ray Image Store - Patient Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN	Received From RIS or Entered by Operator.	VNAP	AUTO
Patient ID	0010,0020	LO	Received From RIS or Entered by Operator.	VNAP	AUTO
Patient's Birth Date	0010,0030	DA	Received From RIS or Entered by Operator.	VNAP.	AUTO
Patient's Sex	0010,0040	CS	Received From RIS or Entered by Operator. F,M,O	VNAP	AUTO

**Table 63: Specialized PMS X-Ray Image Store - General Study Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA		VNAP	AUTO
Study Time	0008,0030	TM		VNAP	AUTO
Accession Number	0008,0050	SH	Zero length if not received from RIS.	VNAP	AUTO
Referring Physician's Name	0008,0090	PN	Zero length if not received from RIS.	VNAP	AUTO
Study Description	0008,1030	LO		ANAP	AUTO
Study Instance UID	0020,000D	UI	Generated at the creation of the study or received from RIS.	ALWAYS	AUTO
Study ID	0020,0010	SH	Always zero.	VNAP	AUTO

**Table 64: Specialized PMS X-Ray Image Store - General Series Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA		VNAP	AUTO
Series Time	0008,0031	TM		ANAP	AUTO
Modality	0008,0060	CS	RF	ALWAYS	AUTO
Performing Physician's Name	0008,1050	PN	Received from RIS, entered by user or is empty if not known.	VNAP	AUTO
Referenced Performed Procedure Step Sequence	0008,1111	SQ		VNAP	AUTO
> Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Protocol Name	0018,1030	LO		ANAP	AUTO
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Series Number	0020,0011	IS		VNAP	AUTO
Laterality	0020,0060	CS	Always zero length value.	MAYBE	AUTO
Performed Procedure Step Start Date	0040,0244	DA	From MPPS	VNAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM	From MPPS	VNAP	AUTO
Performed Procedure Step Description	0040,0254	LO	From MPPS	VNAP	AUTO
Request Attributes Sequence	0040,0275	SQ	Items: 1-n	VNAP	AUTO
> Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO
> Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO
> Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO
> Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	AUTO
>> Code Value	0008,0100	SH		ANAP	AUTO
>> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO
>> Code Meaning	0008,0104	LO		ANAP	AUTO

**Table 65: Specialized PMS X-Ray Image Store - General Equipment Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	VNAP	AUTO
Institution Name	0008,0080	LO	Hospital	VNAP	AUTO
Station Name	0008,1010	SH	Eleva	ANAP	AUTO
Manufacturer's Model Name	0008,1090	LO	Digital Imaging	VNAP	AUTO
Device Serial Number	0018,1000	LO		VNAP	AUTO
Software Version(s)	0018,1020	LO	DSI R1.2.2 LUTPROM 04-04-06 R6.1.3 for DI, or DSI R2.1.2 LUT 04-01-02 R6.1.3.0119 for DITTO	VNAP	AUTO

**Table 66: Specialized PMS X-Ray Image Store - General Image Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Date	0008,0022	DA		VNAP	AUTO
Content Date	0008,0023	DA		MAYBE	AUTO
Acquisition Time	0008,0032	TM		VNAP	AUTO
Content Time	0008,0033	TM		MAYBE	AUTO
Acquisition Number	0020,0012	IS		VNAP	AUTO
Instance Number	0020,0013	IS		VNAP	AUTO
Patient Orientation	0020,0020	CS		MAYBE	AUTO
Image Comments	0020,4000	LT		ANAP	AUTO

**Table 67: Specialized PMS X-Ray Image Store - Image Pixel Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Rows	0028,0010	US	1024, 512	ALWAYS	AUTO
Columns	0028,0011	US	1024, 512	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

**Table 68: Specialized PMS X-Ray Image Store - Display Shutter Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shutter Shape	0018,1600	CS	CIRCULAR RECTANGULAR	ALWAYS	AUTO
Shutter Left Vertical Edge	0018,1602	IS		ANAP	AUTO
Shutter Right Vertical Edge	0018,1604	IS		ANAP	AUTO
Shutter Upper Horizontal Edge	0018,1606	IS		ANAP	AUTO
Shutter Lower Horizontal Edge	0018,1608	IS		ANAP	AUTO
Center of Circular Shutter	0018,1610	IS	VR = IS, VM = 2 Location of the center of the circular shutter with respect to pixels in the image given as row and column. Required if Shutter Shape is CIRCULAR.	ANAP	AUTO
Radius of Circular Shutter	0018,1612	IS	Required if Shutter Shape is CIRCULAR.	ANAP	AUTO

**Table 69: Specialized PMS X-Ray Image Store - X-Ray Image Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	US	ORIGINAL, PRIMARY, SINGLE PLANE	ALWAYS	AUTO
Samples per Pixel	0028,0002	CS	0x0001=1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	US	MONOCHROME2	ALWAYS	AUTO
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO
Bits Stored	0028,0101	US	8	ALWAYS	AUTO
High Bit	0028,0102	US	7	ALWAYS	AUTO
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO
Pixel Intensity Relationship	0028,1040	US	DISP	ALWAYS	AUTO

**Table 70: Specialized PMS X-Ray Image Store – X-Ray Acquisition Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	0018,0060	DS		VNAP	AUTO
Exposure Time	0018,1150	IS	Required if Exposure (0018,1152) is not present.	MAYBE	AUTO
X-Ray Tube Current	0018,1151	IS	Required if Exposure (0018,1152) is not present.	MAYBE	AUTO
Exposure	0018,1152	IS	Required if either Exposure Time (0018,1150) or X-Ray Tube Current (0018,1151) are not present.	MAYBE	AUTO
Radiation Setting	0018,1155	CS	GR, SC	ALWAYS	AUTO

Note: In this version of the EDI the attributes (0018,1150) "Exposure Time" and "Exposure " (0018,1152) are sending out together.

**Table 71: Specialized PMS X-Ray Image Store - VOI LUT Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	0028,1050	DS	related to the DI Contrast / Brightness.	ANAP	AUTO
Window Width	0028,1051	DS	related to the DI Contrast / Brightness. Required if (0028,1050) is sent	ANAP	AUTO

**Table 72: Specialized PMS X-Ray Image Store - SOP Common Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	AUTO
SOP Class UID	0008,0016	UI	1.3.46.670589.2.3.1.1	ANAP	AUTO
SOP Instance UID	0008,0018	UI		ANAP	AUTO

**Table 73: Specialized PMS X-Ray Image Store - XRF POSITIONER Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Distance Source to Detector	0018,1110	DS		ANAP	AUTO

### 8.1.1.4 Grayscale Softcopy Presentation State SOP Class for the ELEVA DI and ELEVA DITTO

**Table 74: Modules of the Grayscale Softcopy Presentation State Storage SOP Class**

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 75	ALWAYS
Study	General Study Module	Table 76	ALWAYS
Series	General Series Module	Table 77	ALWAYS
	Presentation Series Module	Table 84	ALWAYS
Equipment	General Equipment Module	Table 78	ALWAYS
Presentation State	Display shutter module	Table 86	CONDITIONAL
	Displayed Area Module	Table 82	ALWAYS
	Graphic Layer Module	Table 85	CONDITIONAL
	Graphic Annotation Module	Table 87	CONDITIONAL
	Softcopy Presentation LUT Module	Table 81	ALWAYS
	Softcopy VOI LUT Module	Table 80	CONDITIONAL
	Presentation State Module	Table 83	ALWAYS
	SOP Common Module	Table 79	ALWAYS
	Additional Attributes Module	Table 88	OPTIONAL

If private Grayscale Presentation State information exists, in RAW Mode, then the DI DICOM AE will be send the Grayscale Softcopy Presentation State object with the Presentation Label " **AS ACQUIRED**".

**Table 75: Grayscale Softcopy Presentation State Storage SOP Class - Patient Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN	Patient's full name.	VNAP	SPEC
Patient ID	0010,0020	LO	Primary hospital identification number or code for the patient.	VNAP	SPEC
Patient's Birth Date	0010,0030	DA	Birth data of the patient.	VNAP	SPEC
Patient's Sex	0010,0040	CS	Received From RIS or Entered by Operator. F,M,O	VNAP	SPEC

**Table 76: Grayscale Softcopy Presentation State Storage SOP Class - General Study Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA	Time the study started.	VNAP	SPEC
Study Time	0008,0030	TM	generated by RIS	VNAP	SPEC
Accession Number	0008,0050	SH	User or equipment generated	VNAP	SPEC

			Study identifier.		
Referring Physician's Name	0008,0090	PN	Patient's Referring physician.	VNAP	SPEC
Study Description	0008,1030	LO	Date the study started.	ANAP	USER
Study ID	0020,0010	SH	Unique identifier for the Study.	VNAP	SPEC
Study Instance UID	0020,000D	UI	Date the study started.	ALWAYS	SPEC

**Table 77: Grayscale Softcopy Presentation State Storage SOP Class - General Series Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA	Name of the Physicians administering the Series.	ANAP	SPEC
Series Time	0008,0031	TM	Unique identifier of the Series.	ANAP	SPEC
Performing Physician's Name	0008,1050	PN		ANAP	AUTO
Protocol Name	0018,1030	LO		ANAP	SPEC
Series Instance UID	0020,000E	UI	Date the Series started.	ALWAYS	SPEC
Series Number	0020,0011	IS	Time the Series started.	VNAP	SPEC
Laterally	0020,0060	CS	A number that identifies the Series.	MAYBE	SPEC
Performed Procedure Step Start Date	0040,0244	DT		ANAP	SPEC
Performed Procedure Step Start Time	0040,0245	TM		ANAP	SPEC
Performed Procedure Step Description	0040,0254	LO		ANAP	SPEC

**Table 78: Grayscale Softcopy Presentation State Storage SOP Class - General Equipment Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	ANAP	AUTO
Institution Name	0008,0080	LO	Hospital	ANAP	SPEC
Station Name	0008,1010	SH	Eleva	ANAP	SPEC
Manufacturer's Model Name	0008,1090	LO	Digital Imaging	ANAP	SPEC
Device Serial Number	0018,1000	LO		ANAP	SPEC
Software Versions	0018,1020	LO	DSI R1.2.2 LUTPROM 04-04-06 R6.1.3 for DI, or DSI R2.1.1 LUT 04-01-02 R6.1.3.0119 for DITTO	ANAP	SPEC

**Table 79: Grayscale Softcopy Presentation State Storage SOP Class - SOP Common Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	SPEC
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ANAP	SPEC
SOP Instance UID	0008,0018	UI		ANAP	SPEC



**Table 80: Grayscale Softcopy Presentation State Storage SOP Class - Softcopy VOI LUT Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Softcopy VOI LUT Sequence	0028,3110	SQ		ALWAYS	SPEC
> Window Center	0028,1050	DS	related to the DI Contrast / Brightness.	ANAP	SPEC
> Window Width	0028,1051	DS	related to the DI Contrast / Brightness.	ANAP	SPEC
> Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	SPEC
> Window Smoothing Taste	2001,104E	CS	CONVENTIONAL	ANAP	SPEC
> Window Center Sub	2001,1074	DS	1-n	ALWAYS	SPEC
> Window Width Sub	2001,1075	DS	1-n	ANAP	SPEC
> GL TrafoType	2001,1077	CS	LINEARVOI	ANAP	SPEC

**Table 81: Grayscale Softcopy Presentation State Storage SOP Class - Softcopy Presentation LUT Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Presentation LUT Shape	2050,0020	CS		ANAP	SPEC
Presentation LUT Sequence	2050,0010	SQ		ANAP	SPEC
> LUT Descriptor	0028,3002	US		ALWAYS	USER
> LUT Data	0028,3006	US		ALWAYS	SPEC

**Table 82: Grayscale Softcopy Presentation State Storage SOP Class - Displayed Area Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	AUTO
> Displayed Area Top Left Hand Corner	0070,0052	SL	1,1	ALWAYS	AUTO
> Displayed Area Bottom Right Hand Corner	0070,0053	SL	1024 1024	ALWAYS	AUTO
> Presentation Size Mode	0070,0100	CS	MAGNIFY, SCALE TO FIT, TRUE SIZE	ALWAYS	AUTO
> Presentation Pixel Spacing	0070,0101	DS	1,1	ANAP	AUTO
> Presentation Pixel Aspect Ratio	0070,0102	IS		ANAP	AUTO

**Table 83: Grayscale Softcopy Presentation State Storage SOP Class - Presentation State Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO
> Series Instance UID	0020,000E	UI		ALWAYS	AUTO
> Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO
>> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO

>> Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO
Instance Number	0020,0013	IS		ALWAYS	AUTO
Content Label	0070,0080	CS	"AS ACQUIRED"	ALWAYS	USER
Content Description	0070,0081	LO		VNAP	USER
Presentation Creation Date	0070,0082	DT		ALWAYS	AUTO
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO
Content Creator's Name	0070,0084	PN		VNAP	AUTO

**Table 84: Grayscale Softcopy Presentation State Storage SOP Class - Presentation Series Module (M)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	0008,0060	CS	PR	ALWAYS	AUTO

**Table 85: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Layer Module ( C )**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Layer Sequence	0070,0060	SQ		ALWAYS	AUTO
> Graphic Layer	0070,0002	CS		ALWAYS	AUTO
> Graphic Layer Order	0070,0062	IS		ALWAYS	AUTO

**Table 86: Grayscale Softcopy Presentation State Storage SOP Class - Shutter Module(O)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Display Shutter Sequence	2001,1069	SQ	Display Shutter Presentation can vary per image.	ANAP	USER
> Shutter Shape	0018,1600	CS	CIRCULAR, RECTANGULAR	ANAP	USER
> Shutter Left Vertical Edge	0018,1602	IS		ANAP	USER
> Shutter Right Vertical Edge	0018,1604	IS		ANAP	USER
> Shutter Upper Horizontal Edge	0018,1606	IS		ANAP	USER
> Shutter Lower Horizontal Edge	0018,1608	IS		ANAP	USER
> Center of Circular Shutter	0018,1610	IS		ANAP	USER
> Radius of Circular Shutter	0018,1612	IS		ANAP	USER

**Table 87: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Annotation Module ( C )**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Annotation Sequence	0070,0001	SQ		ALWAYS	AUTO
> Graphic Layer	0070,0002	CS		ALWAYS	AUTO
>Text Object Sequence	0070,0008	SQ		ANAP	AUTO
>> Bounding Box Annotation Units	0070,0003	CS		ANAP	AUTO

>> Anchor Point Annotation Units	0070,0004	CS	DISPLAY, PIXEL	ANAP	AUTO
>> Unformatted Text Value	0070,0006	ST	From user input. degr, %, mm	ALWAYS	USER
>> Bounding Box TLHC	0070,0010	FL		ANAP	AUTO
>> Bounding Box BRHC	0070,0011	FL		ANAP	AUTO
>> Bounding Box Text Horizontal Justification	0070,0012	CS	CENTER, LEFT, RIGHT	ANAP	AUTO
>> Anchor Point	0070,0014	FL		ANAP	USER
>> Anchor Point Visibility	0070,0015	CS	N, Y	ANAP	USER
>> Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	AUTO
>> Measurement Text Units	2001,105D	ST	MM, CM, PIXEL, MM*2 CM*2, PIXEL*2 DEGREES, HF (Houndsfield), O_UNITS (none of the other Defined measurement units) UNKNOWN (unknown unit)	ANAP	USER
>> Measurement Text Type	2001,105E	ST	ANGLESIZE, CONTOURDENSITY, POLYLINELENGTH, CONTOURAREASIZE, CONTOURMPV, POINTPIXELVALUE	ANAP	USER
>> Text Type	2001,1064	SH	TEXT, MEASUREMENT If the attribute is absent, the default value of TEXT must be assumed.	ANAP	USER
>> Text Anchor Point Alignment	2001,1080	LO	Absolute, TopLeft, Center, TopCenter, TopRight, LeftCenter, RightCenter, BottomLeft, BottomCenter BottomRight	ANAP	USER
>> Graphic Number Sequence	2001,109A	SQ		ANAP	USER
>>> Private Creator Group 2001	2001,0010	LO	Private Creator Group 2001	ANAP	USER
>>> Graphic Number	2001,109B	UL	The number within the annotation sequence.	ANAP	USER
>> Text Color Foreground	2001,10A3	UL	Default is white (0Xffffff).	ANAP	USER
>> Text Color Background	2001,10A4	UL	ARGB value of the text background color. Each A, R, G and B value ranges from 0 to 255. Default is transparent (0x00000000). In the DI: 0Xff000000=-16777216	ANAP	USER
> Graphic Object Sequence	0070,0009	SQ		ANAP	AUTO
>> Graphic Annotation Units	0070,0005	CS	PIXEL,	ALWAYS	AUTO
>> Graphic Dimensions	0070,0020	US		ALWAYS	AUTO
>> Number of Graphics Points	0070,0021	US		ALWAYS	USER
>> Graphic Data	0070,0022	FL		ALWAYS	AUTO
>> Graphic Type	0070,0023	US	CIRCLE, ELLIPSE, INTERPOLATED, POINT, POLYLINE	ALWAYS	USER
>> Graphic Filled	0070,0024	CS	N, Y	ANAP	USER
>> Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	USER

>> Graphic Line Style	2001,1046	CS	SOLID, DOTTED, DASHED, DASHEDDOTTED	ANAP	USER
>> Poly Line Interpolation Method	2001,104B	CS	LINEAR, SMOOTH	ANAP	USER
>> Poly Line Begin Point Style	2001,104C	CS	NONE, ARROW, DOT	ANAP	USER
>> Poly Line End Point Style	2001,104D	CS	NONE, ARROW, DOT	ANAP	USER
>> Graphic Annotation Model	2001,105A	ST	BILINE – A bi-line measurement. SPOKEWHEEL – A spoke wheel measurement. SEEDDROI – A seeded ROI annotation. XCALIBRATIONLINE – A line measurement used as calibration line for Xray images. LINKED_ROI – A group of annotations that always have to be changed together (Linked to each other).	ANAP	USER
>> Graphic Line Color	2001,1055	UL	The color is defined in ARGB (red-green-blue) values. Each A, R, G and B value ranges from 0 to 255. Here: 0Xffffff=-1	ANAP	USER
>> Graphic Type	2001,1056	CS	POLYLINE = n-tuple of coordinates between lines are to be drawn according to the Poly Line Interpolation Method (n >1)	ANAP	USER
>> Graphic Number	2001,109B	UL	The number within the annotation sequence. Here: 0x00000001=1	ANAP	USER
> Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	USER
> Graphic Annotation Model	2001,005A	ST	BILINE. SPOKEWHEEL, SEEDDROI, XCALIBRATIONLINE LINKED_ROI. Here: XCALIBRATIONLINE	ANAP	USER

**Table 88: Grayscale Softcopy Presentation State Storage SOP Class - Additional Annotation Module(O)**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	USER
Window Invert	2001,1053	CS	Y, N	ANAP	USER
Has Edge Enhancement Sequence	2001,106B	SQ		ANAP	USER
> Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	USER
> Edge Enhancement Gain Factor Sub	2001,1028	LO		ANAP	USER
> Edge Enhancement Gain Factor Non Sub	2001,1029	FL		ANAP	USER

> Edge Enhancement Taste Non Sub	2001,102B	CS	CONTRASTADAPTIVE	ANAP	USER
> Edge Enhancement Gain Taste	2001,107E	US		ANAP	USER
> Pixel Processing Kernel Size	2001,109F	US	Present if Edge Enhancement Kernel Size is absent. Row, Column	ANAP	USER
GL Trafo Type	2001,1077	CS	LINEARMODALITY, NL_MODALITY, NONLINEARVOI, L_PRESENTATION, NL_PRESENTATION, R_LINEARMODALITY, R_NL_MODALITY. LINEARVOI, Here: NL_PRESENTATION	ANAP	USER
> Harmonization Sequence	2001,1079	SQ	Comment: PMS private associations.	ANAP	USER
> Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	USER
> Harmonization Factor	2001,102C	FL	Here: 0.300000	ANAP	USER
> Harmonization Gain	2001,102F	FL	Here: 1.000000	ANAP	USER
> Harmonization Offset	2001,104F	FD	Range: [0.0 - 1.0] Here: 0.150000	ANAP	USER
> Pixel Processing Kernel Size	2001,109F	US	First field: row Second field: column Here: 0x0001=1, 0x0040=64	ANAP	USER
Processing Order Specialization	2001,1094	LO	DSI_PROCESSING_ORDER	ANAP	USER

### 8.1.2 Attribute Mapping

The following table shows the relation between BWLM and MPPS and image Storage attributes.

**Table 89: Attribute Mapping during Modality Workflow**

Name	BWLM Tag	MPPS		Image IOD Tag
		Create Tag	Set Tag	
Specific Character Set	0008,0005	-	-	0008,0005
Accession Number	0008,0050	0008,0050	-	0008,0050

Name	BWL M Tag	MPPS		Image IOD Tag
		Create Tag	Set Tag	
Modality	0008,0060	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	0008,1150	0008,1140	0008,1140	0008,1140
> Referenced SOP Class UID	-	0008,1150	0008,1150	0008,1150
SOP Class UID	-	-	-	-
> Referenced SOP Instance UID	-	0008,1155	0008,1155	0008,1155
SOP Instance UID	-	-	-	-
Patient's Name	0010,0010	0010,0010	-	0010,0010
Patient ID	0010,0020	0010,0020	-	0010,0020
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
Patient's Size	0010,1020	-	-	0010,1020
Patient's Weight	0010,1030	-	-	0010,1030
Patient's Telephone Numbers	0010,2154	-	-	0010,2154
Medical Alerts	0010,2000	-	-	0010,2000
Contrast Allergies	0010,2110	-	-	0010,2110
Ethnic group	0010,2160	-	-	0010,2160
Additional Patient History	0010,21B0	-	-	0010,21B0
Patient Comments	0010,4000	-	-	0010,4000
KVP	-	-	0018,0060	0018,0060
Protocol Name	-	-	0018,1030	0018,1030
Image Area Dose Product	-	-	0018,115E	0018,115E
Study Instance UID	0020,000D	0020,000D	-	0020,000D
Series Instance UID	-	-	0020,000E	0020,000E
Study ID	-	0020,0010	-	0020,0010
Requested Procedure Description	0032,1060	0032,1060	-	-
Scheduled Procedure Step Description	0040,0007	0040,0007	-	0040,0007
Performed Procedure Step Description	-	0040,0254	0040,0254	0040,0254
Scheduled Protocol Code Sequence	0040,0008	0040,0008	-	0040,0008
Performed Protocol Code Sequence	-	0040,0260	0040,0260	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

### 8.1.3 Coerced / Modified fields

In general, ELEVA DI (Ditto) will try and optimize the imported image data. This may involve the removal of redundant data, either or not due to the creation of a Grayscale Softcopy Presentation State object for the image data. This may also involve the creation of extra attributes. As it is not the intention of ELEVA DI (Ditto) to export this data as such, the SOP Instance UID shall not be changed.

If not available at import then ELEVA DI (Ditto) will create the additional attributes as listed in the Table below.

**Table 90: Additional Attributes for ELEVA DI (Ditto)**

Name	Tag	Generated Value
Performed Procedure Step Start Date	0040,0244	Copied from (0008,0020) Study Date.
Performed Procedure Step Start Time	0040,0245	Copied from (0008,0030) Study Time.
Performed Procedure Step ID	0040,0253	Copied from (0020,0010) Study ID.
Performed Procedure Step Description	0040,0254	Copied from (0008,1030) Study Description.

**Table 91: Omitted Attributes for ELEVA DI (Ditto)**

Attribute Name	Tag	VR	Comment
<b>Patient Module</b>			
Referenced Patient Sequence	0008,1120	SQ	
Patient's Birth Time	0010,0032	TM	
Other Patient's Id's	0010,1000	LO	
Other Patient's Names	0010,1001	PN	
Ethnic Group	0010,2160	SH	
Patient Comments	0010,4000	LT	
<b>General Study Module</b>			
Referring Physician Identification Sequence	0008,0096	SQ	
Study Description	0008,1030	LO	
Procedure Code Sequence	0008,1032	SQ	
Physician(s) of Record	0008,1048	PN	
Physician(s) of Record Identification Sequence	0008,1049	SQ	
Name of Physician(s) Reading Study	0008,1060	PN	
Physician(s) Reading Study Identification Sequence	0008,1062	SQ	
Referenced Study Sequence	0008,1110	SQ	
<b>Patient Study Module</b>			
Admitting Diagnoses Description	0008,1080	UI	
Admitting Diagnoses Code Sequence	0008,1084	SQ	
Patient's Age	0010,1010	AS	
Patient's Size	0010,1020	DS	
Patient's Weight	0010,1030	DS	
Occupation	0010,2180	SH	
Additional Patient's History	0010,21B0	LT	
<b>Clinical Trial Study Module</b>			
Clinical Trial Time Point Description	0012,0051	ST	
<b>General Series Module</b>			
Series Date	0008,0021	DA	
Series Time	0008,0031	TM	
Series Description	0008,103E	LO	
Performing Physicians' Name	0008,1050	PN	
Performing Physician Identification Sequence	0008,1052	SQ	
Operators' Name	0008,1070	PN	
Operators Identification Sequence	0008,1072	SQ	
Referenced Performed Procedure Step Sequence	0008,1111	SQ	
Body Part Examined	0018,0015	CS	

Attribute Name	Tag	VR	Comment
Protocol Name	0018,1030	LO	
Smallest Pixel Value in Series	0028,0108	US/SS	
Largest Pixel Value in Series	0028,0109	US/SS	
Performed Procedure Step Start Date	0040,0244	DA	
Performed Procedure Step Start Time	0040,0245	TM	
Performed Procedure Step ID	0040,0253	SH	
Performed Procedure Step Description	0040,0254	LO	
Performed Protocol Code Sequence	0040,0260	SQ	
Request Attributes Sequence	0040,0275	SQ	
Comments on the Performed Procedure Step	0040,0280	ST	
<b>General Equipment Module</b>			
Institution Name	0008,0080	LO	
Institution Address	0008,0081	SH	
Station Name	0008,1010	SH	
Institutional Department Name	0008,1040	LO	
Manufacturer's Model Name	0008,1090	LO	
Device Serial Number	0018,1000	LO	
Software Versions	0018,1020	LO	
Spatial Resolution	0018,1050	DS	
Date of Last Calibration	0018,1200	DA	
Time of Last Calibration	0018,1201	TM	
Pixel Padding Value	0028,0120	US/SS	
<b>Display Shutter Module</b>			
Shutter Presentation Value	0018,1622	US	
<b>Overlay Plane Module</b>			
Overlay Description	60xx,0022	LO	
Overlay Subtype	60xx,0045	LO	
ROI Area	60xx,1301	IS	
ROI Mean	60xx,1302	DS	
ROI Standard Deviation	60xx,1303	DS	
Overlay Label	60xx,1500	LO	
<b>SOP Common Module</b>			
Instance Creation Date	0008,0012	DA	
Instance Creation Time	0008,0013	TM	
Instance Creator UID	0008,0014	UI	
Coding Scheme Identification Sequence	0008,0110	SQ	
Timezone Offset From UTC	0008,0201	SH	
Contributing Equipment Sequence	0018,A001	SQ	
Instance Number	0020,0013	IS	
SOP Instance Status	0100,0410	CS	
SOP Authorization Date and Time	0100,0420	DT	
SOP Authorization Comment	0100,0424	LT	
Authorization Equipment Certification Number	0100,0426	LO	
MAC Parameters Sequence	4FFE,0001	SQ	
Digital Signatures Sequence	FFFA,FFFA	SQ	

Table 92: Cleared Attributes for ELEVA DI (Ditto)

Attribute Name	Tag	VR	Comment
<b>Patient Module</b>			
Patient's Name	0010,0010	PN	



Attribute Name	Tag	VR	Comment
Patient ID	0010,0020	LO	
Patient's Birth Date	0010,0030	DA	
Patient's Sex	0010,0040	CS	
<b>Clinical Trial Subject Module</b>			
Clinical Trial Protocol Name	0012,0021	LO	
Clinical Trial Site ID	0012,0030	LO	
Clinical Trial Site Name	0012,0031	LO	
<b>General Study Module</b>			
Study Date	0008,0020	DA	
Study Time	0008,0030	TM	
Accession Number	0008,0050	SH	
Referring Physician's Name	0008,0090	PN	
Study ID	0020,0010	SH	
<b>Clinical Trial Study Module</b>			
Clinical Trial Time Point ID	0012,0050	LO	
<b>General Series Module</b>			
Patient Position	0018,5100	CS	
Series Number	0020,0011	IS	
Laterality	0020,0060	CS	
<b>Clinical Trial Series Module</b>			
Clinical Trial Coordinating Center Name	0012,0060	LO	
<b>General Equipment Module</b>			
Manufacturer	0008,0070	LO	
<b>Mask Module</b>			
Recommended Viewing Mode	0028,1090	CS	
<b>Overlay/Curve Activation Module</b>			
Curve Activation Layer	50xx,1001	CS	
Overlay Activation Layer	60xx,1001	CS	

ELEVA DI (Ditto) allows the operator to modify attributes of the stored images; see Table 93.

ELEVA DI (Ditto) does not modify the pixel values of the stored images. Modified images retain their original Study, Series and Image UID.

**Table 93: Modifiable Attributes**

Attribute Name	Tag	VR	Comment
<b>Patient</b>			
Patient's Name	0010,0010	PN	

Attribute Name	Tag	VR	Comment
Patient ID	0010,0020	LO	
Patient's Birth Date	0010,0030	DA	
Patient's Sex	0010,0040	CS	
Medical Alerts	0010,2000	LO	
Contrast Allergies	0010,2110	LO	
Patient Comments	0010,4000	LT	
<b>Study</b>			
Accession Number	0008,0050	SH	
Referring Physician's Name	0008,0090	PN	
Study Description	0008,1030	LO	
Physician(s) of Record	0008,1048	PN	
Name of Physician(s) Reading Study	0008,1060	PN	
Admitting Diagnoses Description	0008,1080	LO	
Patient's Age	0010,1010	AS	
Occupation	0010,2180	SH	
Additional Patient History	0010,21B0	LT	
<b>Examination</b>			
Performed Station Name	0040,0242	SH	
Performed Location	0040,0243	SH	
Performed Procedure Step Description	0040,0254	LO	
Performed Procedure Type Description	0040,0255	LO	
Comments on the Performed Procedure Step	0040,0280	ST	
<b>Series</b>			
-	-		

## 8.2 Data Dictionary of Private Attributes

Not applicable.

### 8.3 Coded Terminology and Templates

Not applicable.

### 8.4 Grayscale Image consistency

The high-resolution display monitor attached to the product can be calibrated by using the service tool together with a light probe. See the [VFRB] for details on the calibration procedure.

### 8.5 Standard Extended/Specialized/Private SOPs

The Standard DICOM SOP Classes may be Extended with additional attributes:

Standard attributes of other SOP Classes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

Retired (from ACR NEMA 1.0 or 2.0) attributes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

Private attributes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

The Table 94 list the supported Private SOP Classes. The usage of these SOP Classes are in the ELEVA DI Systems domain only. However instances of these Private SOP Classes may be exported towards a PACS environment and stored in a (central) DICOM archive and should be configured in order to make this possible.

**Table 94: Private SOP classes of ELEVA DI System**

SOP Class	Description
Specialized X-ray (Private class)	1.3.46.670589.2.3.1.1

### 8.6 Private Transfer Syntaxes

None.