Canon

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DICOM CONFORMANCE STATEMENT

FOR

X-RAY DIGITAL RADIOGRAPHY SYSTEM

Aitella SREX-D32C
(PDR-05A)

V1.1

CANON MEDICAL SYSTEMS CORPORATION

May. 2025

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1 Overview

SREX-D32 Aitella is Digital X-ray system for medical examinations and it supports DICOM Storage, MWM, MPPS and Media Storage as shown in Figure 1-1.

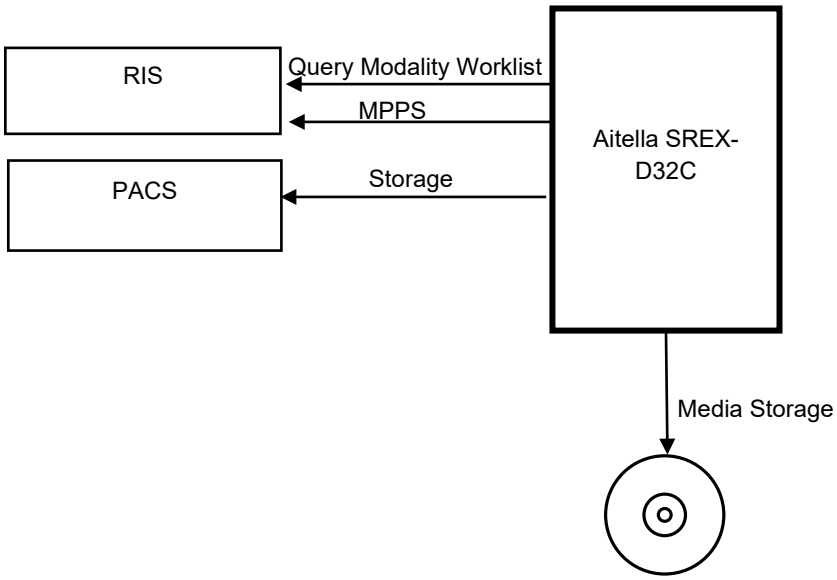

Figure 1-1 Overview of Implemented Services

1.1 Content and Transfer

Table 1-1 lists all Storage SOP Classes and the supported transfer mechanisms as well as the usage scenarios for those instances.

The "Transfer Syntax Set" column lists the sets of Transfer Syntaxes defined in Table 1-2 that are applicable to each SOP Class. The "DIMSE", "DICOM Web" and "Media Services" columns indicate the roles supported for each SOP Class.

The "Function" columns indicate how the instances are used by the system:

- Create: The system creates instances of the SOP Class. The type of the created SOP Class is indicated by one of the following abbreviations:
  - S: Standard SOP Class
  - SE: Standard Extended SOP Class
  - SP: Specialized SOP Class
  - P: Private SOP Class
- Display: The system displays the instances of the SOP Class to the user, either by displaying the SOP Instances natively or by applying instances of another suitable SOP Class to the image instances (e.g., a Presentation State or CAD SR).
- Process: The system processes the instances of the SOP Class to derive some further information that is made available to the user (e.g., a CAD processing algorithm, or a 3D Rendering).
- Archive: The system stores the instances of the SOP Class and makes them available again.

Table 1-1 Storage SOP Classes

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Media Storage Directory Storage	1.2.840.10008.1.3.10	ITS	N	N	N	N	Y*	N	N	Y	N	N	N
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	ITS	Y	N	N	N	Y	N	N	SE	Y	N	N
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	NI	Y	N	N	N	Y	N	N	See Table 1-3			

* Option

Media Storage Directory Storage is optional for the External Storage feature. It is always enabled for the Transport Media Storage feature.

Table 1-2 Supported Transfer Syntaxes

Transfer Syntax Set	Transfer Syntax Name	Transfer Syntax UID	DICOM Web Service Bulkdata Media Type
Image Transfer Syntax Set (**ITS**)	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	N/A
	JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	N/A
	Implicit VR Little Endian	1.2.840.10008.1.2	N/A
	Explicit VR Little Endian	1.2.840.10008.1.2.1	N/A
Non-Image Transfer Syntax Set (**NI**)	Implicit VR Little Endian	1.2.840.10008.1.2	N/A
	Explicit VR Little Endian	1.2.840.10008.1.2.1	N/A

1.1.1 Structured Reporting Root Template IDs

Table 1-3 lists all Template IDs (TID) of Root Templates that are supported by the system. The "Function" column indicates how the system uses the content of the DICOM SR:

- CREATE: The system creates instances using the specified TID.
- RENDER: The system displays the content of the SR, without using the data for any processing.
- EXTRACT_DATA: The system can extract structured data from the content and use the data for subsequent processing (e.g., reporting).
- OVERLAY: The system uses the information in the SR to display information directly on the images (e.g., Mammography CAD markers).
- ARCHIVE: The system stores instances for later retrieval.

The "SOP Class UID" column indicates which of the SR Storage SOP Classes are used to encode the information or to store it. If multiple SOP Classes are supported the "Condition" column describes the conditions for using the different SOP Classes.

Table 1-3 Supported Root SR Template IDs (TIDs)

Name	Root TID	Function	SOP Classes	Condition
Projection X-Ray Radiation Dose	10001	CREATE	X-Ray Radiation Dose SR Storage	N/A

1.2 DIMSE Services

1.2.1 Verification

Table 1-4 lists support for the Verification SOP Class.

Table 1-4 Verification SOP Class

SOP Classes		Transfer Syntax		SCU	SCP
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	N

1.2.2 Storage

For details on supported Storage SOP Classes, see Section 1.1.

1.2.3 Workflow Management

Table 1-5 lists all supported Workflow Management SOP Classes.

Table 1-5 Workflow Management SOP Classes

SOP Classes		Transfer Syntax		SCU	SCP
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	Y*	N
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	Y*	N

* Option

1.2.4 Query/Retrieve - N/A

N/A

1.2.5 Printing - N/A

N/A

1.3 DICOM Web Services - N/A

N/A

1.4 Media Services

Table 1-6 lists all supported Media Application Profiles.

Table 1-6 Supported Media Application Profiles

Media Storage Application Profile	FSC	FSR	FSU
Compact Disk - Recordable			
STD-GEN-CD	Y	N	N
DVD			
STD-GEN-DVD-JPEG	Y	N	N
USB and Flash Memory			
STD-GEN-USB-JPEG	Y	N	N

1.5 Real Time Video Service - N/A

N/A

1.6 De-identification Profiles

Table 1-7 lists all supported de-identification profiles and options.

Table 1-7 De-Identification Profiles

Profile	Option
Basic Application Level Confidentiality	none

1.7 Specific Character Sets

Table 1-8 Supported Specific Character Sets

Defined Term	IANA	Description
Single-Byte Character Sets without Code Extensions		
N/A	ISO-646 or US-ASCII	Default Repertoire
Single-Byte Character Sets with Code Extension		
ISO 2022 IR 6	ISO-646 or US-ASCII	Default Repertoire
Multi-Byte Character Sets with Code Extensions		
ISO 2022 IR 87	ISO-2022-JP	JIS X 0208: Japanese Kanji

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3 Introduction

3.1 Revision History

Revision	Date	Product Version(s)	Change
	May. 2025	V1.1	Initial Version

3.2 Audience

This document is intended for the audience listed below. It is assumed that the reader has a working knowledge of the DICOM Standard.

The document structure was designed for easier access to relevant information for different user groups:

- Clinical Users, who want to get an overview of the implemented interoperability features of the system can see Section 4 Implementation Model.
- Personnel involved in Sales can use the information in Section 1 to assess the compatibility between different systems involved in a sales situation.
- System Integrators can use information in Section 6 during system installation and also information from Section 5 Service and Interoperability Description for details regarding the implemented services.
- Field Service Engineers can use the details from Section 5 Service and Interoperability Description and from Section 7 Network and Media Communication Details for troubleshooting.
- Hospital IT staff focusing on security can use the details provided in Section 8 Security regarding implemented Security features.
- Research Personnel may be interested in using information provided in Annex A Information Object Definitions (IODs) or Annex B Structured Report Content Encoding to get detailed imaging and measurement information.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between SREX-D32C Aitella and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. DICOM by itself does not guarantee interoperability.

- The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.
- This Conformance Statement should not replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, it is the user's responsibility to perform the following validation activities:
  - The comparison of Conformance Statements from SREX-D32C Aitella and other DICOM conformant equipment is the first step towards assessing interconnectivity and interoperability between those systems.
  - Test procedures should be defined and executed to validate the required level of interoperability with specific DICOM conformant equipment, as established by the healthcare facility.

3.4 Terms and Definitions

The following list includes DICOM Terms, that are used throughout this Conformance Statement:

Application Entity	A representation of the external behavior of an application process in terms of DICOM Network Services, Web Services and/or media exchange capabilities implemented in one or more roles. A single device may have multiple Application Entities.
Application Entity Title	The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.
Application Context	The specification of the type of communication used between Application Entities. Example: DICOM network protocol.
Association	A network communication channel set up between Application Entities.
Attribute	A unit of information in an Information Object Definition; a Data Element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower-level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Data Element	A unit of information as defined by a single entry in the data dictionary. An encoded Information Object Definition (IOD) Attribute that is composed of, at a minimum, three fields: a Data Element Tag, a Value Length, and a Value Field. For some specific Transfer Syntaxes, a Data Element also contains a VR Field where the Value Representation of that Data Element is specified explicitly
Information Object Definition	The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. Examples: MR Image IOD, CT Image IOD, Print Job IOD. The Attributes within an IOD may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).
Media Application Profile	The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs).
Module	A set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient's Name, Patient ID, Patient' Birth Date, and Patient's Sex.
Negotiation	First phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.
Origin Server	Refers to the program that can originate authoritative responses to HTTP requests for a given Target Resource. The term "server" refers to any implementation that receives a web service request message from a user agent.
Presentation Context	The set of DICOM Network Services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.
Private SOP Class	A SOP Class that is not defined in the DICOM Standard but is published in an implementation's Conformance Statement.
Protocol Data Unit	A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.
Security Profile	A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data.
Service Class Provider	Role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User	Role of an Application Entity that uses a DICOM Network Service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).
SOP Class	The specification of the network or media transfer (service) of a particular type of data (object) ; the fundamental unit of a DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
SOP Instance	An information object; a specific occurrence of information exchanged in a SOP Class. E.g., a specific X-ray image.

Specialized SOP Class	A SOP Class that is derived from the Standard that is specialized by additional type 1, 1C, 2, 2C, or 3 Attributes, by enumeration of specific permitted Values for Attributes, or by enumeration of specific permitted Templates. The additional Attributes may either be drawn from the Data Dictionary in PS3.6 or may be Private Attributes.
Standard SOP Class	A SOP Class defined in the Standard, and that is implemented and used without any modifications.
Standard Extended SOP Class	A SOP Class that is defined in the standard, and that is extended by additional type 3 Attributes. The additional Attributes may either be drawn from the DICOM Data Dictionary in PS3.6 or may be Private Attributes.
Tag	A 32-bit identifier for a Data Element, represented as a pair of four-digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element].
Transfer Syntax	The encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), Little Endian Explicit Value Representation.
TLS-Secured Port	TCP port on which an implementation accepts TLS connections to exchange DICOM information.
Unique Identifier	A globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.
User Agent	A client in a network protocol used in communications within a client-server distributed computing system. In particular, the Hypertext Transfer Protocol (HTTP) identifies the client software originating the request, using a user-agent header, even when the client is not operated by a user.
Value Representation	The format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR) ; with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

The following list includes product specific definitions used throughout this Conformance Statement

single radiography mode	One of the image acquisition modes. When the Radiographic X-ray switch is pressed, one image is acquired.
F-REC mode	One of the image acquisition modes. While the fluoroscopic image is being displayed, the fluoroscopic image is recorded.
Last Image Hold (LIH)	A function that displays a still fluoroscopic image on the monitor immediately after the fluoroscopy switch is released.
LIH Save mode	This mode saves the fluoroscopic image displayed on the monitor by the LIH.

3.5 Abbreviations

Abbreviations that are used in this DICOM Conformance Statement are listed here.

AE	Application Entity
AET	Application Entity Title
ARTIM	Application Request/Reject/Release Timer
CAD	Computer Aided Detection
CDA	Clinical Document Architecture
CID	Context Identifier
DCS	DICOM Conformance Statement

DICOM	Digital Imaging and Communications in Medicine
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
IANA	Internet Assigned Numbers Authority
IHE	Integrating the Healthcare Enterprise
ILE	Implicit VR Little Endian
IOD	Information Object Definition
ISO	International Organization for Standardization
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
NEMA	National Electrical Manufacturers Association
NTP	Network Time Protocol
OS	Origin Server
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
RIS	Radiological Information System
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
TID	Template Identifier
UA	User Agent
UI	User Interface
UID	Unique Identifier
VR	Value Representation

3.6 References

[1]National Electrical Manufacturers Association (NEMA), Rosslyn, VA USA. PS3 / ISO 12052 Digital Imaging and Communications in Medicine (DICOM) Standard. https://www.dicomstandard.org/ .

[2]Integrating the Healthcare Enterprise (IHE). IHE Radiology Technical Framework. https://www.ihe.net/Resources/technical_frameworks/#radiology .

4 Implementation Model

Aitella is a digital radiography/fluoroscopy system used for mass health screening. The system is intended for use in the gastrointestinal region.

4.1 Application Entities and Data Flow

The network and media interchange application model for the SREX-D32C Aitella is shown in Figure 4-1 SREX-D32C Aitella Application Data Flow Diagram.

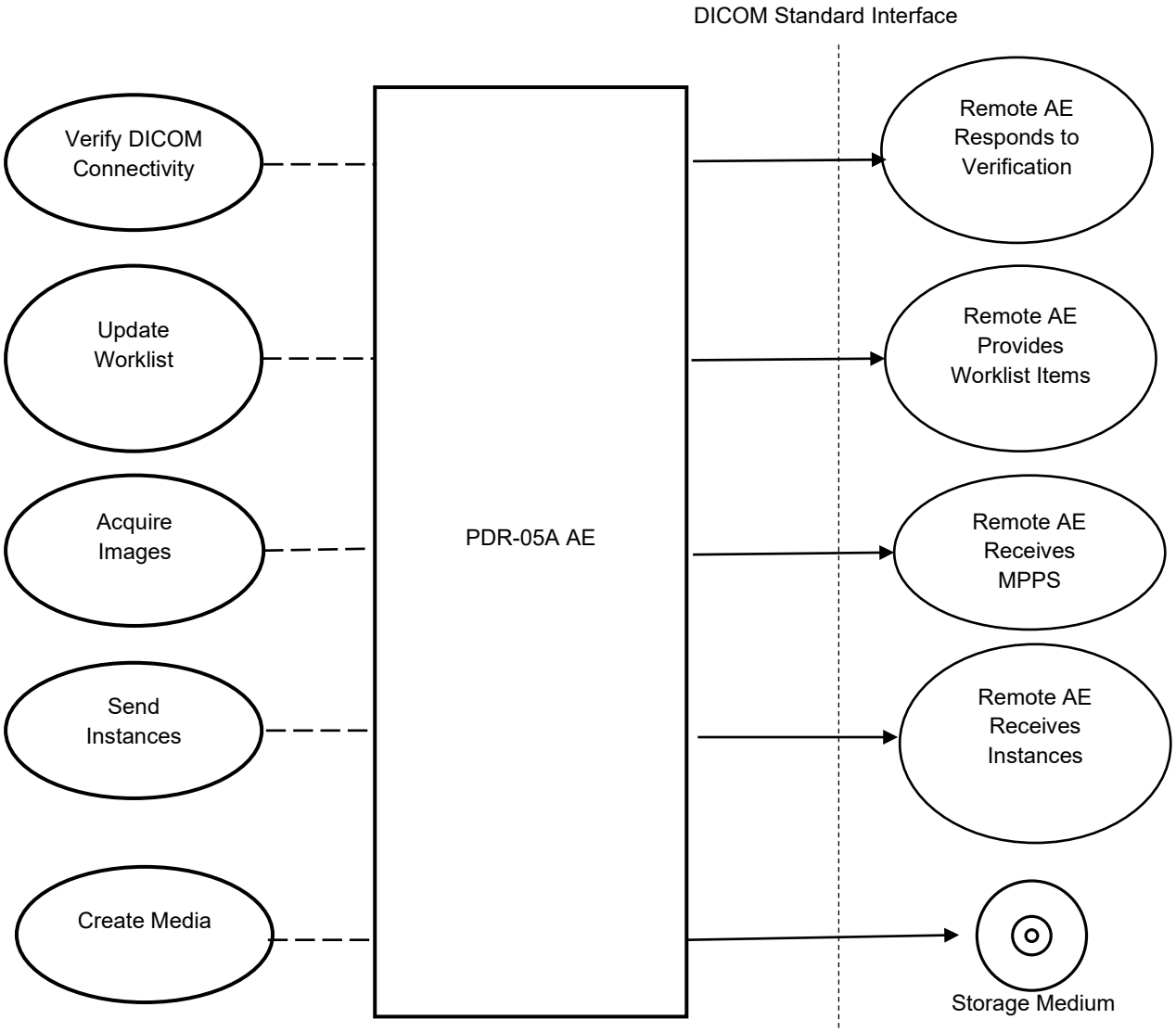

Figure 4-1 SREX-D32C Aitella Application Data Flow Diagram

4.1.1 Functional Definition of PDR-05A AE

PDR-05A AE is SCU of DICOM Storage service. It sends local images and Structured Report to Remote AE by user's Send Images operation.

By user's Update Worklist operation, PDR-05A AE requests to get new worklists to Remote AE. After receiving new worklists, the results will be displayed in a separate list.

PDR-05A AE performs the creation of a MPPS Instance automatically whenever images are acquired. When "Start Study" button to start new study is pressed by user, MPPS N-CREATE request will be sent automatically. MPPS N-SET will be sent when "Finish Study" button is pressed.

Activation of the "Create Media" button or menu entry will pass the currently selected patients, studies, series or instances (images, structured reports) to the PDR-05A AE. The SOP Instances associated with the selection will be collected into one or more export jobs. The contents of each export job will be written to a single media.

5 Service and Interoperability Description

5.1 Mapping of Services to Application Entities

Table 5-1 provides an overview of the Application Entities and the Services supported by each AE.

Table 5-1 Service to AE Mapping

Application Entity	Supported Services	Role								
		DIMSE		DICOM Web		DICOM Media			Real-Time Video	
		SCU	SCP	Origin Server	User Agent	FSC	FSU	FSR	SCU	SCP
PDR-05A AE	Verification	Y	N	N	N	N	N	N	N	N
	Basic Worklist Management	Y	N	N	N	N	N	N	N	N
	MPPS	Y	N	N	N	N	N	N	N	N
	Storage	Y	N	N	N	N	N	N	N	N
	Media Storage	N	N	N	N	Y	N	N	N	N

5.2 DIMSE Services

5.2.1 Basic Worklist Management Service

5.2.1.1 SCU of the Modality Worklist Information Model - FIND SOP Class

As a Service Class User of the Modality Worklist Information Model - FIND SOP Class, the SREX-D32C Aitella uses the C-FIND-RQ message to query the SCP. It supports the Query Keys listed in Table 5-2.

In the "Matching Type" column, the following Values can be used:

- SINGLE_VALUE: SCU can request single Value matching on this Attribute.
- UID: SCU can request List of UID matching on this Attribute.
- WILDCARD: SCU can request Wildcard matching on this Attribute.
- RANGE: SCU can request Range matching on this Attribute.
- SEQUENCE: SCU can request sequence matching on this Attribute.
- UNIVERSAL: SCU can request that the Attribute be a return Value (universal matching).

In the "Query Value Source" column, the following Values can be used:

- FIXED: The query Value cannot be modified by the user or by configuration.
- GENERATED: The query Value is generated by the system (e.g., current date as the study date).
- CONFIGURATION: The query Value is dependent on system configuration.
- USER: The query Value is entered by the user.
- SCANNED: The query Value is read from a barcode scanner or similar device.
- EMPTY: The query Value is sent with a zero-length Value to indicate it is a return key only.

In the "Display on UI" column the following Values can be used:

- D: the return Value is displayed on the main UI by default.
- C: the return Value is displayed on the main UI if configured.
- N: the return Value is never displayed.

Table 5-2 Supported C-FIND Query Parameters for Modality Worklist - SCU

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	SEQUENCE			N	
>Scheduled Station AE Title	(0040,0001)	SINGLE_VALUE	CONFIGURATION; USER	e.g. "PDR-05A"	N	
>Scheduled Procedure Step Start Date	(0040,0002)	RANGE	CONFIGURATION; USER	e.g. "20241002-20241002"	D	
>Scheduled Procedure Step Start Time	(0040,0003)	UNIVERSAL	EMPTY		N	
>Modality	(0008,0060)	SINGLE_VALUE	CONFIGURATION; USER	e.g. "RF"	N	
>Scheduled Performing Physician's Name	(0040,0006)	UNIVERSAL	EMPTY		N	
>Scheduled Station Name	(0040,0010)	SINGLE_VALUE; UNIVERSAL	CONFIGURATION; USER	e.g. "room1"	N	
Requested Procedure						
Requested Procedure ID	(0040,1001)	UNIVERSAL	EMPTY		N	
Requested Procedure Description	(0032,1060)	UNIVERSAL	EMPTY		N	
Requested Procedure Code Sequence	(0032,1064)	SEQUENCE			N	
Study Instance UID	(0020,000D)	UNIVERSAL	EMPTY		N	
Study Date	(0008,0020)	UNIVERSAL	EMPTY		N	
Study Time	(0008,0030)	UNIVERSAL	EMPTY		N	
Referenced Study Sequence	(0008,1110)	SEQUENCE			N	
Requested Procedure Priority	(0040,1003)	UNIVERSAL	EMPTY		N	
Patient Transport Arrangements	(0040,1004)	UNIVERSAL	EMPTY		N	
Requested Procedure Description	(0032,1060)	UNIVERSAL	EMPTY		N	
Requested Procedure Location	(0040,1005)	UNIVERSAL	EMPTY		N	
Imaging Service Request						
Accession Number	(0008,0050)	SINGLE_VALUE	CONFIGURATION; USER ; SCANNED		C	
Referring Physician's Name	(0008,0090)	UNIVERSAL	EMPTY		D	
Requesting Service	(0032,1033)	UNIVERSAL	EMPTY		N	
Visit Identification						

Institution Name	(0008,0080)	UNIVERSAL	EMPTY		N	
Institution Address	(0008,0081)	UNIVERSAL	EMPTY		N	
Institutional Department Name	(0008,1040)	UNIVERSAL	EMPTY		N	
Visit Status						
Visit Status ID	(0038,0008)	UNIVERSAL	EMPTY		N	
Current Patient Location	(0038,0300)	UNIVERSAL	EMPTY		N	
Patient's Institution Residence	(0038,0400)	UNIVERSAL	EMPTY		N	
Visit Admission						
Admitting Diagnoses Description	(0008,1080)	UNIVERSAL	EMPTY		N	
Patient Relationship						
Referenced Study Sequence	(0008,1110)	SEQUENCE			N	
Patient Identification						
Patient's Name	(0010,0010)	UNIVERSAL	EMPTY		N	
Patient ID	(0010,0020)	SINGLE_VALUE	CONFIGURATION; USER ; SCANNED		C	
Other Patient IDs Sequence	(0010,1002)	SEQUENCE			N	
>Patient ID	(0010,0020)	UNIVERSAL	EMPTY		C	
>Type Of Patient ID	(0010,0022)	UNIVERSAL	EMPTY		N	
Other Patient Names	(0010,1001)	UNIVERSAL	EMPTY		N	
Patient Demographic						
Patient's Birth Date	(0010,0030)	UNIVERSAL	EMPTY		D	
Patient's Sex	(0010,0040)	UNIVERSAL	EMPTY		D	
Patient's Weight	(0010,1030)	UNIVERSAL	EMPTY		N	
Patient's Size	(0010,1020)	UNIVERSAL	EMPTY		N	
Confidentiality constraint on patient data	(0040,3001)	UNIVERSAL	EMPTY		N	
Patient's Age	(0010,1010)	UNIVERSAL	EMPTY		D	
Occupation	(0010,2180)	UNIVERSAL	EMPTY		N	
Patient's Birth Time	(0010,0032)	UNIVERSAL	EMPTY		N	
Patient's Address	(0010,1040)	UNIVERSAL	EMPTY		N	
Patient's Telephone Numbers	(0010,2154)	UNIVERSAL	EMPTY		N	
Ethnic Group	(0010,2160)	UNIVERSAL	EMPTY		N	
Patient Comments	(0010,4000)	UNIVERSAL	EMPTY		D	
Patient Medical						
Patient State	(0038,0500)	UNIVERSAL	EMPTY		D	
Pregnancy Status	(0010,21C0)	UNIVERSAL	EMPTY		D	
Medical Alerts	(0010,2000)	UNIVERSAL	EMPTY		D	

Allergies	(0010,2110)	UNIVERSAL	EMPTY		D	
Special Needs	(0038,0050)	UNIVERSAL	EMPTY		D	
Additional Patient History	(0010,21B0)	UNIVERSAL	EMPTY		D	
Other / Extended / Private						
Specific Character Set	(0008,0005)		CONFIGURATION	e.g. "\ISO 2022 IR 87"		If replaced or extended character set exists in C-FIND-RQ data set.
SOP Class UID	(0008,0016)	UNIVERSAL	EMPTY		N	
Study Description	(0008,1030)	UNIVERSAL	EMPTY		D	
Performing Physician Name	(0008,1050)	UNIVERSAL	EMPTY		N	
Name Of Physicians Reading Study	(0008,1060)	UNIVERSAL	EMPTY		N	
Operators Name	(0008,1070)	UNIVERSAL	EMPTY		N	
Other Patient IDs (RET)	(0010,1000)	UNIVERSAL	EMPTY		C	
Body Part Examined	(0018,0015)	UNIVERSAL	EMPTY		D	

This product does not support C-FIND-CANCEL requests.

This product displays the supported character sets in response only (not support matching).
If you use a string that contains a wildcard (*) in your query, the wildcard (*) will be included in the data sent.
Also, if you use only the wildcard (*), empty data will be sent to the SCP.

5.2.1.2 SCP of the Modality Worklist Information Model - FIND SOP Class - N/A

N/A

5.2.2 Modality Performed Procedure Step Service

5.2.2.1 SCU of the Modality Performed Procedure Step SOP Class

As a Service Class User of the Modality Performed Procedure Step SOP Class, the SREX-D32C Aitella supports the Attributes listed in Table 5-4 in the N-CREATE-RQ and N-SET-RQ messages, if it creates the message.

In the "Source" column the following Values can be used:

- FIXED: the Value is pre-defined and cannot be modified.
- GENERATED: the Value is generated by the system.
- CONFIGURATION: the Value is copied from system configuration.
- MWL: the Value is copied from modality worklist entry.
- USER: the Value is entered by the user.
- SCANNED: the Value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent with a zero-length Value

Table 5-3 Supported N-CREATE and N-SET Attributes for Modality Performed Procedure Step - SCU

Attribute Name	Tag	Source	Value N-CREATE	Value N-SET	Comments

Specific Character Set	(0008,0005)	CONFIGURATION	e.g. "\ISO 2022 IR 87"	e.g. "\ISO 2022 IR 87"	If replaced or extended character set exists in N-CREATE-RQ data set or N-SET-RQ data.
Performed Procedure Step Relationship					
Scheduled Step Attribute Sequence	(0040,0270)	GENERATED			
>Study Instance UID	(0020,000D)	GENERATED; MWL			
>Referenced Study Sequence	(0008,1110)	EMPTY	<Empty>		
>Accession Number	(0008,0050)	GENERATED; MWL	e.g. "20241002-031"		
>Requested Procedure ID	(0040,1001)	MWL; EMPTY	<Empty>		
>Requested Procedure Description	(0032,1060)	MWL; EMPTY	<Empty>		
>Scheduled Procedure Step ID	(0040,0009)	EMPTY	<Empty>		
>Scheduled Procedure Step Description	(0040,0007)	MWL; EMPTY	<Empty>		
Patient's Name	(0010,0010)	MWL; USER	e.g. "Canon^Tarou=観音^太郎=キヤノン^タロウ""		
Patient ID	(0010,0020)	GENERATED MWL; USER	e.g. "PAT20141002-0001"		
Other Patient IDs Sequence	(0010,1002)	GENERATED			
>Patient ID	(0010,0020)	GENERATED MWL; USER	e.g. "20241002-0034"		
Patient's Birth Date	(0010,0030)	MWL; USER	e.g. "20001231"		
Patient's Sex	(0010,0040)	MWL; USER	e.g. "M"		
Performed Procedure Step Information					
Performed Procedure Step ID	(0040,0253)	GENERATED	e.g. "4623"		
Performed Station AE Title	(0040,0241)	USER	e.g. "PDR-05A"		
Performed Station Name	(0040,0242)	EMPTY	<Empty>		
Performed Location	(0040,0243)	EMPTY	<Empty>		
Performed Procedure Step Start Date	(0040,0244)	GENERATED	e.g. "20241002"		

Performed Procedure Step Start Time	(0040,0245)	GENERATED	e.g. "093705"		
Performed Procedure Step Status	(0040,0252)	GENERATED	e.g. "IN PROGRESS"	e.g. "COMPLETED"	
Performed Procedure Step Description	(0040,0254)	EMPTY	<Empty>	<Empty>	
Performed Procedure Type Description	(0040,0255)	EMPTY	<Empty>	<Empty>	
Performed Procedure Step End Date	(0040,0250)	GENERATED		e.g. "20241002"	
Performed Procedure Step End Time	(0040,0251)	GENERATED		e.g. "094009"	
Image Acquisition Results					
Modality	(0008,0060)	USER	e.g. "RF"		
Study ID	(0020,0010)	GENERATED	e.g. "4623"		
Performed Protocol Code Sequence	(0040,0260)	GENERATED			
Performed Series Sequence	(0040,0340)	GENERATED			
>Performing Physician's Name	(0008,1050)	GENERATED; USER		e.g. "Canon^Hanako"	Copy from Operator's Name
>Protocol Name	(0018,1030)	GENERATED; USER		e.g. "Upper GI"	
>Operators' Name	(0008,1070)	GENERATED; USER		e.g. "Operator^Name"	
>Series Instance UID	(0020,000E)	GENERATED			
>Series Description	(0008,103E)	EMPTY		<Empty>	
>Retrieve AE Title	(0008,0054)	EMPTY		<Empty>	
Total Time of Fluoroscopy	(0040,0300)	GENERATED	e.g. 0	e.g. 19	
Total Number of Exposures	(0040,0301)	GENERATED	e.g. 0	e.g. 17	
Distance Source to Detector	(0018,1110)	GENERATED	e.g. "0"	e.g. "1064"	
Distance Source to Entrance	(0040,0306)	GENERATED; USER	e.g. "0"	e.g. "800"	
Entrance Dose	(0040,0302)	GENERATED	e.g. 0	e.g. 0	
Entrance Dose in mGy	(0040,8302)	GENERATED	e.g. "0"	e.g. "0.73887991905212"	
Image and Fluoroscopy Area Dose Product	(0018,115E)	GENERATED	e.g. "0"	e.g. "16.2032985687256"	
Exposure Dose Sequence	(0040,030E)	GENERATED			
>KVP	(0018,0060)	GENERATED			
>X-Ray Tube Current in μA	(0018,8151)	GENERATED			
>Exposure Time	(0018,1150)	GENERATED			

Other / Extended / Private					
SOP Class UID	(0008,0016)	GENERATED	e.g. "1.2.840.10008.3.1.2.3.3"	e.g. "1.2.840.10008.3.1.2.3.3"	
SOP Instance UID	(0008,0018)	GENERATED			
Other Patient IDs (RET)	(0010,1000)	GENERATED MWL; USER	e.g. "20241002-0034"		
Other / Extended / Private					
Referenced Image Sequence	(0008,1140)	GENERATED			
>Referenced SOP Class UID	(0008,1150)	GENERATED		e.g. "1.2.840.10008.5.1.4.1.1.12.2"	
>Referenced SOP Instance UID	(0008,1155)	GENERATED			

5.2.2.2 SCP of the Modality Performed Procedure Step SOP Class - N/A

N/A

5.2.3 Unified Worklist and Procedure Step Service - N/A

N/A

5.2.4 Instance Availability Notification Service - N/A

N/A

5.2.5 Storage Service

5.2.5.1 SCU of the Storage SOP Classes

As a Service Class User of the Storage Service Class, the SREX-D32C Aitella uses the C-STORE-RQ message to request storage of DICOM objects by a remote SCP. See Section 1.1 Content and Transfer in the Overview for the list of supported SOP Classes.

For details regarding the content of SOP Instances that are created by the system, see Annex A, which describes the underlying IOD of the supported SOP Classes.

Triggering of storage requests is automatically when an instance is stored, automatically when the study is closed, or initiated by the user.

A study is composed of images acquired from the start to the end .Image numbers are assigned to images in the order in which the images were acquired. In single radiography mode, the image number increases as consecutive images are acquired. In F-REC mode, an image number is assigned to each frame from the start to the end of acquisition. The series to which images are assigned will change when the image acquisition mode is switched (for example from single radiography mode to F-REC mode).

5.2.5.1.1 Transcoding of Transfer Syntaxes

Table 5-4 describes supported transcodings between the locally stored encoding of SOP Instances and the negotiated Transfer Syntax. The following Values can be used:

- SUPPORTED: Transcoding is possible and same SOP Instance UID is re-used.
- NEW_UID: Transcoding is possible; however a new SOP Instance is created for transfer, e.g., due to lossy compression.
- NOT_SUPPORTED: Transcoding is not possible.

Table 5-4 Transcoding of Transfer Syntaxes

Stored Transfer Syntax	Sent Transfer Syntax			
	Implicit VR Little Endian	Explicit VR Little Endian	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	JPEG 2000 Image Compression (Lossless Only)
Local Transfer Syntax	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED

5.2.5.2 SCP of the Storage SOP Classes - N/A

N/A

5.2.6 Storage Commitment Service - N/A

N/A

5.2.7 Query/Retrieve Service Class - N/A

N/A

5.2.8 Print Management Service - N/A

N/A

5.3 DICOM Web Services - N/A

N/A

5.4 Media Service

5.4.1 File Set Creator (FSC)

SREX-D32C Aitella supports creating the Basic Directory IOD as a File Set Creator as defined in Annex A.4.

For a list of supported Media Application Profiles, see Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview.

5.4.2 File Set Reader (FSR) - N/A

N/A

5.4.3 File Set Updater (FSU) - N/A

N/A

5.5 Real Time Video Service - N/A

N/A

5.6 Cross Service Considerations - N/A

N/A

5.7 Specific Character Sets

See Section 1.7 for supported Values for Specific Character Set (0008,0005).

Generic configuration for Specific Character Sets is covered in . Service specific configuration for Specific Character Sets is addressed in respective subsections of Section 6.2 or Section 6.3.

SREX-D32C Aitella supports character sets beyond the default character repertoire (ISO-IR 6) for display on all displayed attributes. SREX-D32C Aitella supports editing character sets beyond the default character repertoire (ISO-IR 6) for the attributes listed in Table 5-5.

Table 5-5 Specific Character Set – Supported Attributes

Attribute Name	Tag	VR	Display	Editing
Institution Name	(0008,0080)	LO	N	Y
Institution Address	(0008,0081)	ST	N	Y
Referring Physician's Name	(0008,0090)	PN	Y	Y
Study Description	(0008,1030)	LO	Y	Y
Patient's Name	(0010,0010)	PN	Y	Y
Medical Alerts	(0010,2000)	LO	Y	N
Allergies	(0010,2110)	LO	Y	N
Patient Comments	(0010,4000)	LT	Y	Y
Protocol Name	(0018,1030)	LO	Y	Y
Special Needs	(0038,0050)	LO	Y	N
Patient State	(0038,0500)	LO	Y	N
Confidentiality Constraint on Patient Data Description	(0040,3001)	LO	Y	N

SREX-D32C Aitella supports mapping/conversion of the supported, non-default Specific Character Sets as listed in Table 5-6.

Table 5-6 Conversion/Mapping of Non-Default Specific Character Sets

Incoming Specific Character Set			Outgoing Specific Character Set			Mapping Situation
Defined Term	IANA	Description	Defined Term	IANA	Description	
ISO 2022 IR 6	ISO-646	Half pitch Alphabet	ISO 2022 IR 87	ISO-2022-JP	Japanese full pitch Katakana	Conversion from MWL to instances created

If an unsupported character set is received, the displayed characters will be garbled.

6 Configuration

Throughout all subsections the following Values can be used in the "Configurable" column:

- USER: The parameter is configurable by the user.
- SERVICE: The parameter is configurable by service personnel.
- FIXED: The parameter is not configurable (it has a fixed Value). The Value is required for the configuration of the remote system.
- N/A: The parameter is not applicable for the local or the remote system.

6.1 General Configuration Parameters

Table 6-1 lists general configuration parameters applicable across all supported DICOM Services.

Table 6-1 General Configuration Parameters

Parameter	Configurable	Default Value	Comments
Network Parameters			
Physical Network Interface	FIXED	1000BASE-T 100BASE-TX 10BASE-T	Auto negotiation
IP v6 Support	FIXED	No	
General Parameters			
The maximum PDU length for an association initiated	FIXED	16834 bytes	
TCP/IP Settings			
TCP/IP Send Buffer	FIXED	16384 Bytes	
TCP/IP Receive Buffer	FIXED	16384 Bytes	
DICOM Services Parameters			
Calling AE Title (SCU)	USER SERVICE	PDR-05A	
Specific Character Set	USER SERVICE	\ISO 2022 IR87	\ISO 2022 IR87 or ISO-IR 6

6.2 Configuration of DIMSE Services

The tables in the following subsections show the configuration parameters required for DIMSE Services.

In order to identify whether SREX-D32C Aitella is an SCU and / or an SCP, the following applies:

- SCU: The (Secured) Local Calling AET and Remote Called AET parameters are present.
- SCP: The (Secured) Local Called AET and Remote Calling AET parameters are present.

6.2.1 Basic Worklist Management Service Configuration

Table 6-2 lists Worklist Service configuration parameters:

Table 6-2 Worklist Service Parameters

Local Configuration Parameters - Worklist Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Timeout waiting for acceptance or rejection Response to an Association Open Request. (Application-Level timeout)	FIXED	3 sec	
Calling AE Title (SCU)	USER SERVICE	PDR-05A	
Default Modality type	USER SERVICE	RF	Used to query the MWL SCP. Possible choices are RF,XA,DX,CR
Default Scheduled Station AE Title	USER SERVICE	PDR-05A	Used to query the remote MWL SCP Copy from Calling AE Title (SCU)
Worklist Delimiter	USER SERVICE	NONE	Select the action to be taken when the name separator in an MWM search is a space. Possible choices are NONE,CARAT,COMMA
Worklist tag output selection			
Scheduled Procedure Step Sequence	USER SERVICE	ON	When OFF, tags under the sequence are not output.
>Scheduled Station AE Title	USER SERVICE	ON	
>Scheduled Procedure Step Start Date	USER SERVICE	ON	
>Scheduled Procedure Step Start Time	USER SERVICE	ON	
>Scheduled Performing Physician's Name	USER SERVICE	ON	
>Scheduled Station Name	USER SERVICE	ON	
>Modality	USER SERVICE	ON	
Requested Procedure ID	USER SERVICE	ON	
Requested Procedure Description	USER SERVICE	ON	
Requested Procedure Code Sequence	USER SERVICE	ON	
Study Instance UID	USER SERVICE	ON	
Study Date	USER SERVICE	ON	
Study Time	USER SERVICE	ON	
Referenced Study Sequence	USER	ON	

	SERVICE		
Requested Procedure Priority	USER SERVICE	ON	
Patient Transport Arrangements	USER SERVICE	ON	
Requested Procedure Location	USER SERVICE	ON	
Referring Physician's Name	USER SERVICE	ON	
Accession Number	USER SERVICE	ON	
Requesting Service	USER SERVICE	ON	
Visit Status ID	USER SERVICE	ON	
Patient's Institution Residence	USER SERVICE	ON	
Current Patient Location	USER SERVICE	ON	
Admitting Diagnoses Description	USER SERVICE	ON	
Patient's Name	USER SERVICE	ON	
Patient ID	USER SERVICE	ON	
Other Patient IDs	USER SERVICE	ON	
Other Patient IDs Sequence	USER SERVICE	ON	
Other Patient Names	USER SERVICE	ON	
Patient's Birth Date	USER SERVICE	ON	
Patient's Birth Time	USER SERVICE	ON	
Patient's Sex	USER SERVICE	ON	
Patient's Age	USER SERVICE	ON	
Patient's Size	USER SERVICE	ON	
Patient's Weight	USER SERVICE	ON	
Ethnic Group	USER SERVICE	ON	

Occupation	USER SERVICE	ON	
Patient's Address	USER SERVICE	ON	
Patient's Telephone Numbers	USER SERVICE	ON	
Patient Comments	USER SERVICE	ON	
Confidentiality Constraint on Patient Data Description	USER SERVICE	ON	
Additional Patient History	USER SERVICE	ON	
Patient State	USER SERVICE	ON	
Pregnancy Status	USER SERVICE	ON	
Medical Alerts	USER SERVICE	ON	
Special Needs	USER SERVICE	ON	
Study Description	USER SERVICE	ON	
Body Part Examined	USER SERVICE	ON	
Allergies	USER SERVICE	ON	
Performing Physician's Name	USER SERVICE	ON	
Remote Configuration Parameters - Worklist Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	USER SERVICE		Can configure up to 1 RIS
Port	USER SERVICE		
Host	USER SERVICE		
Description	SERVICE		Provides a description of the Worklist server.
Retry	SERVICE	2	Specifies the number of connection retry attempts. Applied with the values set in the parameter file.
Retry Interval	SERVICE	3000 ms	Sets the interval between connection retries. The unit is milliseconds (ms). Applied with the values set in the parameter file.

6.2.2 Modality Performed Procedure Step Service Configuration

Table 6-3 lists Modality Performed Procedure Step Service configuration parameters:

Table 6-3 MPPS Service Parameters

Local Configuration Parameters - MPPS Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Timeout waiting for acceptance or rejection Response to an Association Open Request. (Application-Level timeout)	FIXED	10 sec	
Calling AE Title (SCU)	USER SERVICE	PDR-05A	The system uses the same Calling AE Title as for the Storage SCU service by default
Patient Name Delimiter	USER SERVICE	CARAT	If the selected symbol is used as a delimiter in the patient name, it will be converted to CARAT. Possible choices are NONE, CARAT, COMMA This item is set in the Patient Register Option.
MPPS N-Create tag output selection			
Scheduled Step Attributes Sequence	USER SERVICE	ON	When OFF, tags under the sequence are not output.
>Study Instance UID	USER SERVICE	ON	
>Referenced Study Sequence	USER SERVICE	ON	
>Accession Number	USER SERVICE	ON	
>Requested Procedure ID	USER SERVICE	ON	
>Requested Procedure Description	USER SERVICE	ON	
>Scheduled Procedure Step ID	USER SERVICE	ON	
>Scheduled Procedure Step Description	USER SERVICE	ON	
Specific Character Set	USER SERVICE	ON	
Patient Name	USER SERVICE	ON	
Patient ID	USER SERVICE	ON	
Other Patient ID	USER SERVICE	ON	
Other Patient ID Sequence	USER SERVICE	ON	

Patient Birth Date	USER SERVICE	ON	
Patient Sex	USER SERVICE	ON	
Performed Station AE Title	USER SERVICE	ON	
Performed Station Name	USER SERVICE	ON	
Performed Location	USER SERVICE	ON	
Performed Procedure Step Start Date	USER SERVICE	ON	
Performed Procedure Step Start Time	USER SERVICE	ON	
Preformed Procedure Step Status	USER SERVICE	ON	
Performed Procedure Step ID	USER SERVICE	ON	
Performed Procedure Step Description	USER SERVICE	ON	
Performed Procedure Type Description	USER SERVICE	ON	
Modality	USER SERVICE	ON	
Study ID	USER SERVICE	ON	
Performed Protocol Code Sequence	USER SERVICE	ON	
Total Time of Fluoroscopy	USER SERVICE	ON	
Total Number of Exposures	USER SERVICE	ON	
Distance Source to Detector	USER SERVICE	ON	
Distance Source to Entrance	USER SERVICE	ON	
Entrance Dose	USER SERVICE	ON	
Entrance Dose in mGy	USER SERVICE	ON	
Image and Fluoroscopy Area Dose Product	USER SERVICE	ON	
MPPS N-Set tag output selection			
Performed Series Sequence	USER SERVICE	ON	When OFF, tags under the sequence are not output.

>Performing Physician's Name	USER SERVICE	ON	
>Protocol Name	USER SERVICE	ON	
>Operation's Name	USER SERVICE	ON	
>Series Instance UID	USER SERVICE	ON	
>Series Description	USER SERVICE	ON	
>Retrieve AE Title	USER SERVICE	ON	
Referenced Image Sequence	USER SERVICE	ON	When OFF, tags under the sequence are not output.
>Referenced SOP Class UID	USER SERVICE	ON	
>Referenced SOP Instance UID	USER SERVICE	ON	
Exposure Dose Sequence	USER SERVICE	ON	When OFF, tags under the sequence are not output.
>KVP	USER SERVICE	ON	
>Exposure Time	USER SERVICE	ON	
>X_Ray Tube Current in UA	USER SERVICE	ON	
Specific Character Set	USER SERVICE	ON	
Performed Procedure Step Status	USER SERVICE	ON	
Performed Procedure Step Description	USER SERVICE	ON	
Performed Procedure Type Description	USER SERVICE	ON	
Performed Procedure Step End Date	USER SERVICE	ON	
Performed Procedure Step End Time	USER SERVICE	ON	
Total Time of Fluoroscopy	USER SERVICE	ON	
Total Number of Exposures	USER SERVICE	ON	
Distance Source to Detector	USER SERVICE	ON	
Distance Source to Entrance	USER	ON	

	SERVICE		
Entrance Dose	USER SERVICE	ON	
Entrance Dose in mGy	USER SERVICE	ON	
Image and Fluoroscopy Area Dose Product	USER SERVICE	ON	
Remote Configuration Parameters - MPPS Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	USER SERVICE		Can configure up to 1 RIS
Port	USER SERVICE		
Host	USER SERVICE		
Retry Count	SERVICE	2	Specifies the number of connection retry attempts.
Description	SERVICE		Provides a description of the MPPS server.

6.2.3 Unified Worklist and Procedure Step Service Configuration - N/A

N/A

6.2.4 Instance Availability Notification Service Configuration - N/A

N/A

6.2.5 Storage Service Configuration

Table 6-4 lists Storage Service configuration parameters:

Table 6-4 Storage Service Parameters

Local Configuration Parameters - Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Timeout waiting for acceptance or rejection Response to an Association Open Request. (Application-Level timeout)	FIXED	60 sec	
Calling AE Title (SCU)	USER SERVICE	PDR-05A	
Supported Transfer Syntax as SCP	USER SERVICE	See Table 1-2	Can force to accept ILE only
Supported Storage SOP Classes as SCP	USER SERVICE	See Table 1-1	Can add or remove Storage SOP Classes
Gamma Table	USER SERVICE	NONE	Processing gamma correction of images. Possible choices are NONE,1～9
Annotation	USER SERVICE	OFF	Processing annotations. Possible choices are ON,OFF

Anonym	USER SERVICE	OFF	Processing of anonymizing patient names. Possible choices are ON,OFF
Multi-frame	USER SERVICE	OFF	Processing of multi-frame output of F-REC mode images. Possible choices are ON,OFF
Transfer Syntax	USER SERVICE	Implicit VR Little Endian	Transfer Syntax Processing Possible choices are Implicit VR Little Endian,Explicit VR Little Endian, JPEG 2000 Lossless, JPEG Lossless
Send Image	USER SERVICE	ON	Processing that does not output images. Set this if you want to output only RDSR. Possible choices are ON,OFF
Use DICOM Dose SR	USER SERVICE	ON	Processing that does not output RDSR. Set this if you want to output only image. Possible choices are ON,OFF
Apply Image Manipulation	USER SERVICE	OFF	A process that reflects the results of operations such as PAN and ZOOM on the image. Possible choices are ON,OFF
Division	USER SERVICE	MERGED	The process of combining and transmitting divide images. Possible choices are MERGED, EACH This item is set in the study protocol.
Patient Name Delimiter	USER SERVICE	SPACE	If the selected symbol is used as a delimiter in the patient name, it will be converted to CARAT. Possible choices are NONE, COMMA, SPACE This item is set in the Patient Register Option.
Remote Configuration Parameters - Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (SCP)	USER SERVICE	AE Title	
Port	USER SERVICE	104	
Host	USER SERVICE	127.0.0.1	
Retry Count	SERVICE	3	Specifies the number of connections retry attempts.

6.2.6 Storage Commitment Service Configuration - N/A

N/A

6.2.7 Query/Retrieve Service Configuration - N/A

N/A

6.2.8 Print Management Service Configuration - N/A
N/A

6.3 Configuration of DICOM Web Services - N/A
N/A

6.4 Configuration of Media Storage Service

Table 6-5 Storage Service Parameters

Local Configuration Parameters - Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Dose report output	USER SERVICE	OFF	
Multi Frame and Single Frame output selection	USER SERVICE	OFF	Processing of multi-frame output of F-REC mode images. Possible choices are ON,OFF
Transfer Syntax	USER SERVICE	JPEG 2000 Lossless	

6.5 Configuration of Real Time Video Service - N/A
N/A

6.6 Configuration of Audit Trail - Syslog - N/A
N/A

7 Network and Media Communication Details

7.1 General

The cross interaction between the AEs is depicted in the diagrams below.

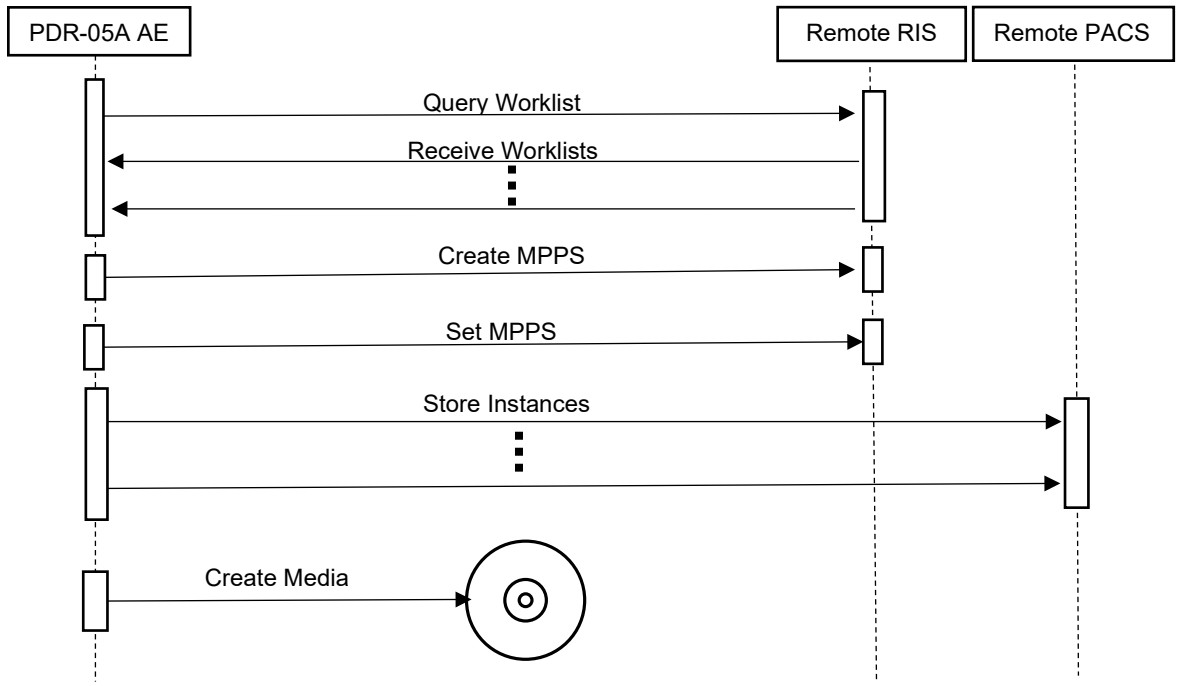

Figure 7-1 Real-World Activity and Cross AE interaction

7.1.1 General Association Parameters

Table 7-1 lists Association parameters applicable to all AEs on the system.

Table 7-1 General Association Parameters

	Name	Value
Networking Services	Application Context Name	1.2.840.10008.3.1.1.1
	Implementation Class UID	1.2.392.200036.9116.32.4
	Implementation Version Name	N/A
	Maximum PDU Length	Default: 16384
	ARTIM Timeout	N/A
	Maximum number of simultaneous Associations as Association Initiator	1
	Maximum number of simultaneous Associations as Association Acceptor	N/A
	Maximum number of outstanding asynchronous Transactions	1
Media Services	File Meta Information Version	1
	Implementation Class UID	1.2.392.200036.9116.32.4
	Implementation Version Name	Chameleon

7.2 Specifications

7.2.1 PDR-05A Application Entity

7.2.1.1 Sequencing of Real-World Activities for PDR-05A AE

7.2.1.2 Association Parameters of PDR-05A AE

Table 7-2 lists Association parameters applicable to PDR-05A AE.

Table 7-2 Association Parameters for PDR-05A AE

	Name	Value
Networking Services	Application Context Name	N/A
	Implementation Class UID	N/A
	Implementation Version Name	N/A
	Maximum PDU Length	N/A
	ARTIM Timeout	N/A
	Maximum number of simultaneous Associations as Association Initiator	N/A
	Maximum number of simultaneous Associations as Association Acceptor	N/A
	Maximum number of outstanding asynchronous Transactions	N/A
Media Services	File Meta Information Version	N/A
	Implementation Class UID	N/A
	Implementation Version Name	N/A

7.2.1.3 Association Initiation

This section details the Association policies of the Application Entity when it is initiating an Association.

7.2.1.3.1 Real-World Activity "Verify DICOM Connectivity"

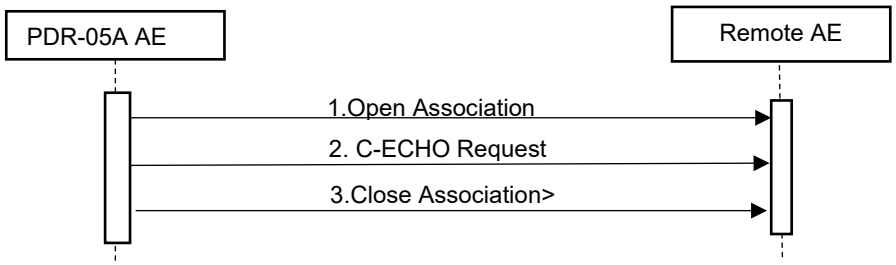

Figure 7-2 Sequencing of Real-World Activities for Verify DICOM Connectivity

1. The PDR-05A AE opens an Association with the Remote AE.
2. The PDR-05A AE sends a verification request (C-ECHO) and the Remote AE replies with a C-ECHO response (status success).
3. The PDR-05A AE closes the association with the Remote AE.

This AE creates an Association with presentation context of Verification SOP Class with the supported Transfer Syntaxes (See Table 1-4).

Extended Negotiation - N/A

N/A

Role Negotiation - N/A

N/A

7.2.1.3.2 Real-World Activity "Update Worklist"

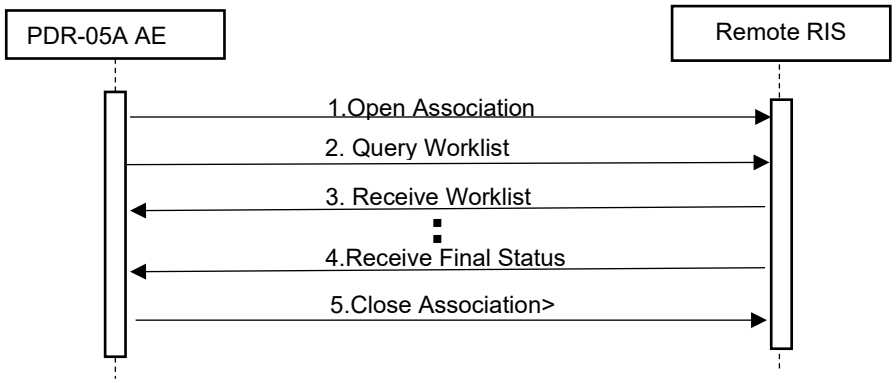

Figure 7-3 Sequencing of Real-World Activities for Update Worklist

1. The PDR-05A AE opens an Association with the Remote RIS.
2. The PDR-05A AE sends a Query Worklist(C-FIND) request to the Remote RIS containing the Worklist Query attributes.
3. The PDR-05A AE receives Worklists from the Remote RIS.
4. The PDR-05A AE receives Final response from the Remote RIS.
5. The PDR-05A AE closes the association with the Remote RIS.

This AE creates an Association with presentation context of Modality Worklist Information Model – Find with the supported Transfer Syntaxes (See Table 1-5).

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity "Update Worklist" are described in Table 7-3.

Table 7-3 Extended Negotiation for Update Worklist of PDR-05A AE1 - Association Initiation

SOP Class	Extended Negotiation	Support	Requested Value
Modality Worklist			
Modality Worklist Information Model - FIND	Fuzzy semantic matching of person names	N	
	Timezone query adjustment	N	

Role Negotiation - N/A

N/A

7.2.1.3.3 Real-World Activity "Acquire Images"

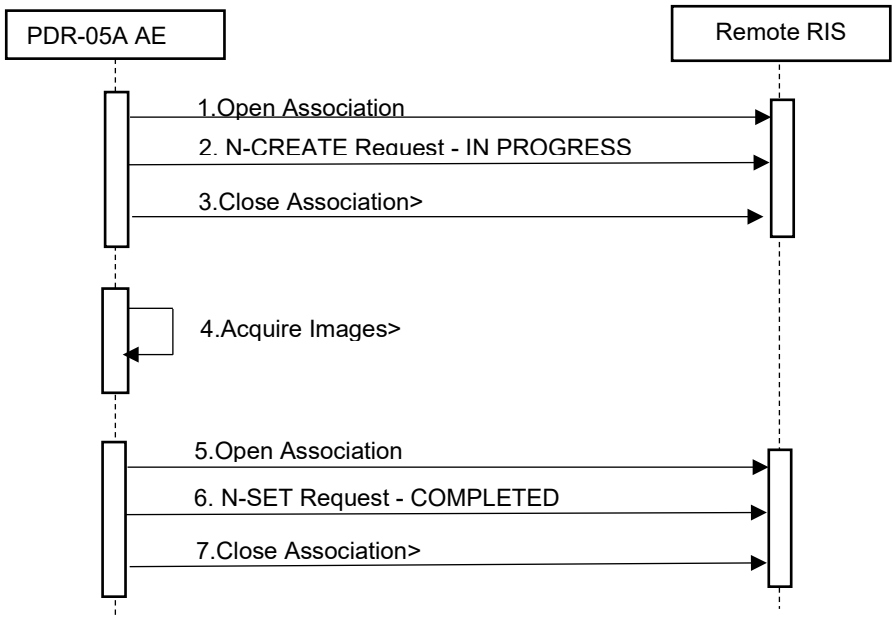

Figure 7-4 Sequencing of Real-World Activities for Acquire Images

1. The PDR-05A AE opens an Association with the Remote RIS.
2. The PDR-05A AE sends a N-CREATE request to the Remote RIS to create an MPPS Instance with status of “IN PROGRESS” and create all necessary attributes. The Remote RIS acknowledges the MPPS creation with an N-CREATE response (status success).
3. The PDR-05A AE closes the association with the Remote RIS.
4. All images are acquired and stored in the local database.
5. The PDR-05A AE opens an Association with the Remote RIS.
6. The PDR-05A AE sends an N-SET request to the Remote RIS to update the MPPS instance with status of “COMPLETED” and set all necessary attributes. The Remote RIS acknowledges the MPPS update with an N-SET response (status success).
7. The PDR-05A AE closes the association with the Remote RIS.

This AE creates an Association with presentation context of Modality Performed Procedure Step SOP Class with the supported Transfer Syntaxes (See Table 1-5).

Extended Negotiation - N/A

N/A

Role Negotiation - N/A

N/A

7.2.1.3.4 Real-World Activity "Send Instances"

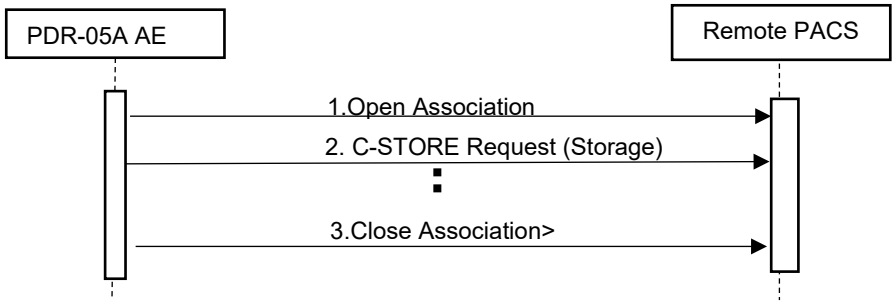

Figure 7-5 Sequencing of Real-World Activities for Send Instances

1. The PDR-05A AE opens an Association with the Remote PACS.

2. The PDR-05A AE transmits the Acquired images to the Remote PACS by Storage request(C-STORE) and the Remote RIS replies with a C-STORE response (status success).
3. The PDR-05A AE closes the association with the Remote PACS.

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity "Send Instances" are described in Table 7-4

Table 7-4 Extended Negotiation for Send Instances of PDR-05A AE - Association Initiation

SOP Class	Extended Negotiation	Support	Requested Value
Storage See PS3.4 B.4.1 Conformance as an SCP for level definition.			
Applicable to all Storage SOP Classes listed under Section 5.	Level of Storage support	N	
	Level of Digital Signature support	N	
	Element Coercion	N	

Role Negotiation - N/A
N/A

7.2.1.4 Association Acceptance - N/A
N/A

7.3 Status Codes

The following sections describe the Status Codes supported by the system for each implemented service as well as the reason for issuing specific Status Codes or the associated behavior when receiving it.

7.3.1 General AE Communication and Failure Behavior and Handling

7.3.1.1 Communication Failure Behavior as Association Initiator

Table 7-8 describes behavior of the AE if a communication failure occurs when it initiated an Association.

Table 7-5 DICOM Communication Failure Behavior as Association Initiator

Failure	Failure Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The status is logged, and job failures are displayed.
Association aborted	The command is marked as failed. The reason is logged.
Network Disconnect	The command is marked as failed. The reason is logged.

7.3.1.2 Communication Failure Handling as Association Acceptor - NA
N/A

7.3.2 DIMSE Services

7.3.2.1 Basic Worklist Management Service

7.3.2.1.1 SCU of the Modality Worklist Information Model Find SOP Class - C-FIND

Table 7-6 lists the Status Codes that the SCU of the Modality Worklist Information Model Find SOP Class supports for the C-FIND message and defines the application behavior when encountering the listed Status Codes.

Table 7-6 Status Codes for C-FIND of the Modality Worklist Information Model SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete - No final identifier is supplied	0000	The items in the received work list are saved in the database, or the process for starting the study is executed.
Failure	Refused: Out of Resources	A700	Associations are aborted using A-RELEASE and are considered a search failure. The status is logged.
	SOP Class Not Supported	0122	Associations are aborted using A-RELEASE and are considered a search failure. The status is logged.
	Error: Data Set does not match SOP Class	A900	Associations are aborted using A-RELEASE and are considered a search failure. The status is logged.
	Error: Unable to process	C000-CFFF	Associations are aborted using A-RELEASE and are considered a search failure. The status is logged.
Cancel	Matching terminated due to cancel	FE00	Associations are aborted using A-RELEASE and are considered a search failure. The status is logged.
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	The items in the received work list are saved in the database and continue receiving from SOP.
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	FF01	The items in the received work list are saved in the database and continue receiving from SOP.
-	Other Status Codes	anything else	Associations are aborted using A-RELEASE and are considered a search failure. The status is logged.

7.3.2.1.2 SCP of the Modality Worklist Information Model Find SOP Class - C-FIND - N/A

N/A

7.3.2.2 Modality Performed Procedure Step Service

7.3.2.2.1 SCU of the Modality Performed Procedure Step SOP Class - N-CREATE

Table 7-7 lists the Status Codes that the SCU of the Modality Performed Procedure Step SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7-7 Status Codes for N-CREATE of the Modality Performed Procedure Step SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	Performed Procedure Step Status (0040,0252) is displayed in the taskbar. And the status is logged.
Warning	Attribute Value out of range	0116	It's the same operation as Success. Performed Procedure Step Status (0040,0252) is displayed in the taskbar. And the status is logged.
	Attribute List warning	0107	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged. However, study will continue.

Service Status	Further Meaning	Status Code	Behavior
Failure	No such Attribute	0105	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged. However, study will continue.
	Invalid Attribute Value	0106	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Processing Failure	0110	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Duplicate SOP Instance	0111	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Invalid SOP Instance	0117	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	No such SOP Class	0118	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Missing Attribute	0120	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Missing Attribute Value	0121	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Refused: Not authorized	0124	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Duplicate invocation	0210	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged, and job failures are displayed in the taskbar. However, study will continue.
	Unrecognized operation	0211	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged. However, study will continue.

Service Status	Further Meaning	Status Code	Behavior
	Mistyped argument	0212	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged. However, study will continue.
	Resource limitation	0213	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged. However, study will continue.
-	Other Status Codes	anything else	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged. However, study will continue.

7.3.2.2.2 SCU of the Modality Performed Procedure Step SOP Class - N-SET

Table 7-8 lists the Status Codes that the SCU of the Modality Performed Procedure Step SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7-8 Status Codes for N-SET of the Modality Performed Procedure Step SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	Performed Procedure Step Status (0040,0252) is displayed in the taskbar. And the status is logged.
Warning	Attribute Value out of range	0116	It's the same operation as Success. Performed Procedure Step Status (0040,0252) is displayed in the taskbar. And the status is logged.
	Attribute List warning	0107	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
Failure	No such Attribute	0105	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Invalid Attribute Value	0106	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Processing Failure - Performed Procedure Step Object may no longer be updated	0110	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Processing Failure	0110	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Invalid SOP Instance	0117	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.

Service Status	Further Meaning	Status Code	Behavior
	No such SOP Class	0118	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Class-Instance conflict	0119	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Missing Attribute Value	0121	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Refused: Not authorized	0124	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Duplicate invocation	0210	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Unrecognized operation	0211	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Mistyped argument	0212	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
	Resource limitation	0213	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.
-	Other Status Codes	anything else	Associations are aborted using A-RELEASE and are considered a MPPS send failure. The status is logged.

7.3.2.2.3 SCP of the Modality Performed Procedure Step SOP Class - N-CREATE - N/A

N/A

7.3.2.2.4 SCP of the Modality Performed Procedure Step SOP Class - N-SET - N/A

N/A

7.3.2.3 Unified Worklist und Procedure Step Service - N/A

N/A

7.3.2.4 Instance Availability Notification Service - N/A

N/A

7.3.2.5 Storage Service

7.3.2.5.1 SCU of the Storage SOP Classes - C-STORE

Table 7-9 lists the Status Codes that the SCU of the Storage SOP Class supports for the C-STORE message and defines the application behavior when encountering the listed Status Codes.

Table 7-9 Status Codes C-STORE for the Storage SOP Classes - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	Display the letter 'S' in the thumbnail. And the status is logged.
Warning	Coercion of Data Elements	B000	It's the same operation as Success. Display the letter 'S' in the thumbnail. And the status is logged.
	Data Set does not match SOP Class	B007	It's the same operation as Success. Display the letter 'S' in the thumbnail. And the status is logged.
	Elements Discarded	B006	It's the same operation as Success. Display the letter 'S' in the thumbnail. And the status is logged.
Failure	SOP Class not supported	0112	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
	Invalid SOP Instance	0117	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
	Duplicate invocation	0210	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
	Unrecognized operation	0211	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
	Mistyped argument	0212	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
	Not authorized	0214	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
	Out of Resources	A700-A7FF	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.

Service Status	Further Meaning	Status Code	Behavior
	Data Set does not match SOP Class	A900-A9FF	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
	Cannot Understand	C000-CFFF	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.
-	Other Status Codes	anything else	After resends, associations are aborted using A-RELEASE and the image transfer is considered a failure. The status is logged, and the job failure is displayed in the taskbar.

7.3.2.5.2 SCP of the Storage SOP Classes - C-STORE - N/A
N/A

7.3.2.6 Storage Commitment Service - N/A
N/A

7.3.2.7 Query/Retrieve Service - N/A
N/A

7.3.2.8 Print Management Service - N/A
N/A

7.3.3 DICOM Web Services - N/A
N/A

8 Security

8.1 Introduction

The security section describes security features implemented by this product. It includes descriptions of non-DICOM network protocols, information to configure firewalls and application whitelists, lists of supported DICOM security profiles as well as Web Security features. Additionally, secured media storage, VPN, etc. are also specified in this security section.

8.2 External Network Requirements

Table 8-1 describes additional non-DICOM network protocols that are used by SREX-D32C Aitella.

Table 8-1 External Network Requirements

Profile	Actor	Transaction	Protocol Used	RFCs	Security Support	Reference
Basic Time Synchronization	NTP Client	Maintain Time	NTP	RFC5905;	No	C.1
		Find NTP Servers	NTP	RFC5905;	No	C.1

8.3 TCP Port Configuration

See Section 6 Configuration for information on the usage of ports for DICOM and other protocols. This section contains helpful information for product administrators to configure firewalls, application whitelists, etc.

For network security settings, see document 2B307-507JA.

8.4 DICOM Security Profiles Support

8.4.1 Secure Use and User Identity Profile - N/A

N/A

8.4.2 Secure Transport Connection Profiles - N/A

N/A

8.4.3 Media Storage Security Profiles - N/A

N/A

8.4.4 Attribute Confidentiality Profiles

Table 8-2 lists supported Attribute Confidentiality Profiles and options:

Table 8-2 Attribute Confidentiality Profiles

Profile	Option	AE	De-identifier	Re-identifier	Configurable
Basic Application Level Confidentiality		PDR-05A AE	Y	N	N

See Annex C.2.6 for implementation details.

8.4.5 Digital Signature Profiles - N/A

N/A

8.4.6 Additional DICOM Security Profiles - N/A

N/A

8.5 User Identity Negotiation Support - N/A

N/A

8.6 Web Services Security Features - N/A

N/A

8.7 Other Security Features - N/A

Annexes

A Information Object Definitions (IODs)

This section describes all the SOP Instances natively created by SREX-D32C Aitella, e.g., images created by an acquisition modality or evidence documents created on a review workstation (i.e., all SOP Classes that are marked in the "Created" column in Table 1-1).

In the "Source" column, the following Values can be used:

- FIXED: The Value is pre-defined and cannot be modified.
- GENERATED: The Value is generated by the system.
- CONFIGURATION: The Value is copied from the system configuration.
- MWL: The Value is copied from a Modality Worklist entry.
- QUERY: The Value is determined by performing a query of any of the supported Query/Retrieve Services.
- USER: The Value is entered by the user.
- SCANNED: The Value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent with a zero-length Value.
- SRC_INSTANCE: The Value is copied from previously created/received SOP Instances.

The "Presence" columns reflect the usage of the Module, Functional Group Macro, Attributes, or Value in the SREX-D32C Aitella Implementation and is not necessarily the same as defined in the DICOM Standard. For the "Presence" column the following Values can be used:

- ALWAYS: the module, functional group macro, Attributes or Value is always present.
- CONDITIONAL: the presence of the module, functional group macro, Attributes or Value is dependent on a condition. The condition must be listed in the "Conditions" column.
- SRC_COPY: The presence of the Attributes and Values depends on the availability of these in the source instances, which are used for copying this information.
- EMPTY: The Attribute is present but without a Value (zero length).
- NEVER: the module or functional group macro is not present.

A.1 Information Shared Across Multiple IODs – N/A

N/A

A.2 X-Ray Radiofluoroscopic Image IOD

Table below defines the structure of X-Ray Radiofluoroscopic Image IOD.

Table A-1 X-Ray Radiofluoroscopic Image IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-2
	Clinical Trial Subject	NEVER		
Study	General Study	ALWAYS		Table A-3
	Patient Study	ALWAYS		Table A-4
	Clinical Trial Study	NEVER		
Series	General Series	ALWAYS		Table A-5
	Clinical Trial Series	NEVER		
Frame of Reference	Synchronization	NEVER		
Equipment	General Equipment	ALWAYS		Table A-6
Acquisition	General Acquisition	ALWAYS		Table A-7
Image	General Image	ALWAYS		Table A-8
	General Reference	NEVER		
	Image Pixel	ALWAYS		Table A-9
	Contrast Bolus	ALWAYS		Table A-10
	Cine	CONDITIONAL	Only if F-REC mode.	Table A-11
	Multi Frame	ALWAYS		Table A-12
	Frame Pointers	NEVER		
	Mask	NEVER		
	X-Ray Image	ALWAYS		Table A-13
	X-Ray Acquisition	ALWAYS		Table A-14
	X-Ray Collimator	NEVER		
	Display Shutter	ALWAYS		Table A-15
	Device	NEVER		
	Intervention	NEVER		
	Specimen	NEVER		
	X-Ray Table	ALWAYS		Table A-16
	XRF Positioner	ALWAYS		Table A-17
	X-Ray Tomography Acquisition	NEVER		
	DX Detector	ALWAYS		Table A-18
	Overlay Plane	NEVER		

IE	Module Name	Presence (Module)	Condition	Reference
	Multi Frame Overlay	NEVER		
	Modality LUT	NEVER		
	VOI LUT	ALWAYS		Table A-19
	SOP Common	ALWAYS		Table A-20
	Common Instance Reference	NEVER		
	Frame Extraction	NEVER		
	Standard Extended	ALWAYS		Table A-21

A.2.1 X-Ray Radiofluoroscopic Image IOD Specific Modules

The following tables list Modules and Attributes specific for X-Ray Radiofluoroscopic Image IOD:

Table A-2 Patient Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient's Name	(0010,0010)	GENERATED; MWL;USER	ALWAYS	ALWAYS	e.g. "Canon^Tarou=観音^太郎=キヤノ ン^タロウ""		
Patient ID	(0010,0020)	GENERATED; MWL;USER;SCANNED	ALWAYS	ALWAYS	e.g. "PAT20141002-0001"		
Patient's Birth Date	(0010,0030)	MWL;USER	ALWAYS	ALWAYS	e.g. "20001231"		
Patient's Sex	(0010,0040)	MWL;USER	ALWAYS	ALWAYS	e.g. "M"		
Other Patient IDs Sequence	(0010,1002)	GENERATED	ALWAYS	ALWAYS			
Other Patient IDs Sequence>Patient ID	(0010,0020)	GENERATED; MWL;USER	ALWAYS	ALWAYS	e.g. "20241002-0034"		
Other Patient IDs Sequence>Type of Patient ID	(0010,0022)	GENERATED	ALWAYS	ALWAYS	e.g. "TEXT"		
Patient Comments	(0010,4000)	MWL;USER	ALWAYS	ALWAYS	e.g. "Patient Memo"		

Table A-3 General Study Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Study Instance UID	(0020,000d)	GENERATED; MWL	ALWAYS	ALWAYS			
Study Date	(0008,0020)	GENERATED	ALWAYS	ALWAYS	e.g. "20241002"		
Study Time	(0008,0030)	GENERATED	ALWAYS	ALWAYS	e.g. "093915"		
Referring Physician's Name	(0008,0090)	MWL;USER	ALWAYS	ALWAYS	e.g. "Nasu^Jirou"		
Study ID	(0020,0010)	GENERATED	ALWAYS	ALWAYS	e.g. "4623"		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Accession Number	(0008,0050)	GENERATED; MWL;USER;SCANNED	ALWAYS	ALWAYS	e.g. "20241002-031"		
Study Description	(0008,1030)	MWL;USER	ALWAYS	ALWAYS	e.g. "Study Description"		

Table A-4 Patient Study Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient's Age	(0010,1010)	MWL;USER	ALWAYS	ALWAYS	e.g. "023Y"		

Table A-5 General Series Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	CONFIGURATION	ALWAYS	ALWAYS	e.g. "RF"		
Series Instance UID	(0020,000e)	GENERATED	ALWAYS	ALWAYS			
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS	e.g. "1"		
Laterality	(0020,0060)	EMPTY	ALWAYS	EMPTY			
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS	e.g. "20241002"		
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS	e.g. "093716"		
Performing Physician's Name	(0008,1050)	CONFIGURATION	ALWAYS	ALWAYS	e.g. "Canon^Hanako"		
Protocol Name	(0018,1030)	CONFIGURATION;USER	ALWAYS	ALWAYS	e.g. "Upper GI"		
Series Description	(0008,103e)	EMPTY	ALWAYS	EMPTY			
Operators' Name	(0008,1070)	CONFIGURATION	ALWAYS	ALWAYS	e.g. "Canon^Hanako"		
Body Part Examined	(0018,0015)	CONFIGURATION;MWL;USER	ALWAYS	ALWAYS	e.g. "CSPINE"		
Performed Procedure Step ID	(0040,0253)	EMPTY	ALWAYS	EMPTY			
Performed Procedure Step Start Date	(0040,0244)	GENERATED; MWL	ALWAYS	ALWAYS	e.g. "20241002"		
Performed Procedure Step Start Time	(0040,0245)	GENERATED; MWL	ALWAYS	ALWAYS	e.g. "093716"		
Performed Procedure Step Description	(0040,0254)	EMPTY	ALWAYS	EMPTY			

Table A-6 General Equipment Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	e.g. "CANON_MEC"		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Institution Name	(0008,0080)	CONFIGURATION;MWL	ALWAYS	ALWAYS	e.g. "Hospital Name"		
Institution Address	(0008,0081)	CONFIGURATION;MWL	ALWAYS	ALWAYS			
Station Name	(0008,1010)	CONFIGURATION;MWL	ALWAYS	ALWAYS	e.g. "Room 1"		
Manufacturer's Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	e.g. "PDR-05A"		
Device Serial Number	(0018,1000)	CONFIGURATION	ALWAYS	ALWAYS			
Software Versions	(0018,1020)	FIXED	ALWAYS	ALWAYS	e.g. "V1.0 SP0000*"		

Table A-7 General Acquisition Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Acquisition Number	(0020,0012)	GENERATED	ALWAYS	ALWAYS	e.g. "1"		
Acquisition Date	(0008,0022)	GENERATED	ALWAYS	ALWAYS	e.g. "20241002"		
Acquisition Time	(0008,0032)	GENERATED	ALWAYS	ALWAYS	e.g. "093716"		

Table A-8 General Image Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	e.g. "1"		
Patient Orientation	(0020,0020)	EMPTY	ALWAYS	EMPTY			
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS	e.g. "20241002"		
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS	e.g. "093716"		
Image Type	(0008,0008)	FIXED	ALWAYS	ALWAYS	e.g. "DERIVED\PRIMARY"		
Image Comments	(0020,4000)	EMPTY	ALWAYS	EMPTY			

Table A-9 Image Pixel Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Samples per Pixel	(0028,0002)	GENERATED	ALWAYS	ALWAYS	e.g. 1		
Photometric Interpretation	(0028,0004)	FIXED	ALWAYS	ALWAYS	e.g. "MONOCHROME2"		
Rows	(0028,0010)	GENERATED	ALWAYS	ALWAYS	e.g. 2048		
Columns	(0028,0011)	GENERATED	ALWAYS	ALWAYS	e.g. 2048		
Bits Allocated	(0028,0100)	GENERATED	ALWAYS	ALWAYS	e.g. 16		
Bits Stored	(0028,0101)	GENERATED	ALWAYS	ALWAYS	e.g. 12		
High Bit	(0028,0102)	GENERATED	ALWAYS	ALWAYS	e.g. 11		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Pixel Representation	(0028,0103)	GENERATED	ALWAYS	ALWAYS	e.g. 0		
Smallest Image Pixel Value	(0028,0106)	GENERATED	ALWAYS	ALWAYS	e.g. 0		
Largest Image Pixel Value	(0028,0107)	GENERATED	ALWAYS	ALWAYS	e.g. 2577		

Table A-10 Contrast Bolus Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Contrast/Bolus Agent	(0018,0010)	EMPTY	ALWAYS	EMPTY			

Table A-11 Cine Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Frame Time	(0018,1063)	GENERATED	ALWAYS	ALWAYS	e.g. "1000"		

Table A-12 Multi-Frame Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Number of Frames	(0028,0008)	GENERATED	ALWAYS	ALWAYS	e.g. "1"		

Table A-13 X-Ray Image Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Image Type	(0008,0008)	FIXED	ALWAYS	ALWAYS	e.g. "DERIVED\PRIMARY"		
Pixel Intensity Relationship	(0028,1040)	FIXED	ALWAYS	ALWAYS	e.g. "DISP"		
Samples per Pixel	(0028,0002)	FIXED	ALWAYS	ALWAYS	e.g. 1		
Photometric Interpretation	(0028,0004)	FIXED	ALWAYS	ALWAYS	e.g. "MONOCHROME2"		
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	e.g. 16		
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	e.g. 12		
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	e.g. 11		
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	e.g. 0		

Table A-14 X-Ray Acquisition Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
KVP	(0018,0060)	USER	ALWAYS	ALWAYS	e.g. "80"		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Radiation Setting	(0018,1155)	FIXED	ALWAYS	ALWAYS	e.g. "GR"		
X-Ray Tube Current	(0018,1151)	USER	ALWAYS	ALWAYS	e.g. "100"		
X-Ray Tube Current in uA	(0018,8151)	GENERATED	ALWAYS	ALWAYS	e.g. "100000"		
Exposure Time	(0018,1150)	GENERATED	ALWAYS	ALWAYS	e.g. "68"		
Exposure Time in uS	(0018,8150)	GENERATED	ALWAYS	ALWAYS	e.g. "68800"		
Average Pulse Width	(0018,1154)	GENERATED	CONDITIONAL	CONDITIONAL	e.g. "0"	LIH Save mode only	
Radiation Mode	(0018,115a)	FIXED	ALWAYS	ALWAYS	e.g. "CONTINUOUS"		
Field of View Shape	(0018,1147)	FIXED	ALWAYS	ALWAYS	e.g. "RECTANGLE"		
Field of View Dimension(s)	(0018,1149)	GENERATED	ALWAYS	ALWAYS	e.g. "304\304"		
Imager Pixel Spacing	(0018,1164)	GENERATED	ALWAYS	ALWAYS	e.g. "0.148\0.148"		
Pixel Spacing	(0028,0030)	GENERATED	ALWAYS	ALWAYS	e.g. "0.125\0.125"		
Image and Fluoroscopy Area Dose Product	(0018,115e)	GENERATED	ALWAYS	ALWAYS	e.g. "3.9349999576807"		

Table A-15 Display Shutter Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Shutter Shape	(0018,1600)	FIXED	ALWAYS	ALWAYS	e.g. "RECTANGULAR"		
Shutter Left Vertical Edge	(0018,1602)	GENERATED	ALWAYS	ALWAYS	e.g. "0"		
Shutter Right Vertical Edge	(0018,1604)	GENERATED	ALWAYS	ALWAYS	e.g. "2048"		
Shutter Upper Horizontal Edge	(0018,1606)	GENERATED	ALWAYS	ALWAYS	e.g. "0"		
Shutter Lower Horizontal Edge	(0018,1608)	GENERATED	ALWAYS	ALWAYS	e.g. "2048"		

Table A-16 X-Ray Table Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Table Motion	(0018,1134)	GENERATED	ALWAYS	ALWAYS	e.g. "STATIC"		
Table Vertical Increment	(0018,1135)	GENERATED	ALWAYS	ALWAYS	e.g. "0"		
Table Longitudinal Increment	(0018,1137)	GENERATED	ALWAYS	ALWAYS	e.g. "0"		
Table Lateral Increment	(0018,1136)	GENERATED	ALWAYS	ALWAYS	e.g. "0"		
Table Angle	(0018,1138)	GENERATED	ALWAYS	ALWAYS	e.g. "0"		

Table A-17 XRF Positioner Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Distance Source to Detector	(0018,1110)	GENERATED	ALWAYS	ALWAYS	e.g. "1064"		
Distance Source to Patient	(0018,1111)	GENERATED	ALWAYS	ALWAYS	e.g. "900"		
Estimated Radiographic Magnification Factor	(0018,1114)	GENERATED	ALWAYS	ALWAYS	e.g. "1.18222222222222"		

Table A-18 DX Detector Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Detector Type	(0018,7004)	GENERATED	ALWAYS	ALWAYS	e.g. "SCINTILLATOR"		
Field of View Shape	(0018,1147)	GENERATED	ALWAYS	ALWAYS	e.g. "RECTANGLE"		
Field of View Dimension(s)	(0018,1149)	GENERATED	ALWAYS	ALWAYS	e.g. "304\304"		
Imager Pixel Spacing	(0018,1164)	GENERATED	ALWAYS	ALWAYS	e.g. "0.148\0.148"		
Pixel Spacing	(0028,0030)	GENERATED	ALWAYS	ALWAYS	e.g. "0.125\0.125"		

Table A-19 VOI LUT Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Window Center	(0028,1050)	GENERATED	ALWAYS	ALWAYS	e.g. "2048"		
Window Width	(0028,1051)	GENERATED	ALWAYS	ALWAYS	e.g. "4095"		

Table A-20 SOP Common Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	GENERATED	ALWAYS	ALWAYS	e.g. "1.2.840.10008.5.1.4.1.1.12.2"		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS			
Specific Character Set	(0008,0005)	CONFIGURATION	ALWAYS	ALWAYS	e.g. "\ISO 2022 IR 87"		
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	e.g. "1"		

Table A-21 Standard Extended Module for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Other Patient IDs	(0010,1000)	MWL;USER	ALWAYS	EMPTY			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Body Part Thickness	(0018,11a0)	CONFIGURATION	ALWAYS	EMPTY			
Positioner Primary Angle	(0018,1510)	GENERATED	ALWAYS	EMPTY			
Positioner Secondary Angle	(0018,1511)	GENERATED	ALWAYS	EMPTY			
Rescale Intercept	(0028,1052)	GENERATED	ALWAYS	EMPTY			
Rescale Slope	(0028,1053)	GENERATED	ALWAYS	EMPTY			
Rescale Type	(0028,1054)	GENERATED	ALWAYS	EMPTY			
Requesting Service	(0032,1033)	GENERATED	ALWAYS	EMPTY			
Entrance Dose	(0040,0302)	GENERATED	ALWAYS	EMPTY			
Distance Source to Entrance	(0040,0306)	GENERATED	ALWAYS	EMPTY			
Entrance Dose in mGy	(0040,8302)	GENERATED	ALWAYS	EMPTY			

A.2.2 X-Ray Radiofluoroscopic Image IOD Functional Group Macros - N/A

N/A

A.2.3 X-Ray Radiofluoroscopic Image IOD Private Modules - N/A

N/A

A.2.4 X-Ray Radiofluoroscopic Image IOD Coded Values

Table below lists Coded Values referenced from the "Value" column of the tables above for X-Ray Radiofluoroscopic Image IOD:

Table A-22 Values and Code Sets for X-Ray Radiofluoroscopic Image IOD

Attribute Name	Tag	Value/Code	Condition	Comments
Image Type	(0008,0008)	DERIVED	Value 1	
		PRIMARY	Value 1	
Body Part Examined	(0018,0015)	SKULL		
		CSPINE		
		TSPINE		
		LSPINE		
		SSPINE		
		COCCYX		
		CHEST		
		CLAVICLE		
		BREAST		
		ABDOMEN		
		PELVIS		
		HIP JOINT		
		SHOULDER		

Attribute Name	Tag	Value/Code	Condition	Comments
		ELBOW		
		KNEE		
		ANKLE		
		HAND		
		FOOT		
		EXTREMITY		
		HEAD		
		HEART		
		NECK		
		LOWER LEG		
		FOREARM		
		UPPER ARM		
		JAW		

A.3 X-Ray Radiation Dose SR IOD

Table below defines the structure of X-Ray Radiation Dose SR IOD.

Table A-23 X-Ray Radiation Dose SR IOD

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A-24
	Clinical Trial Subject	NEVER		
Study	General Study	ALWAYS		Table A-25
	Patient Study	EMPTY		
	Clinical Trial Study	NEVER		
Series	SR Document Series	ALWAYS		Table A-26
	Clinical Trial Series	NEVER		
Frame of Reference	Synchronization	NEVER		
Equipment	General Equipment	ALWAYS		Table A-27
Document	SR Document General	ALWAYS		Table A-28
	SR Document Content	ALWAYS		Table A-29
	SOP Common	ALWAYS		Table A-30
	Standard Extended	ALWAYS		Table A-31

A.3.1 X-Ray Radiation Dose SR IOD Specific Modules

The following tables list Modules and Attributes specific for X-Ray Radiation Dose SR IOD:

Table A-24 Patient Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient's Name	(0010,0010)	MWL;USER	ALWAYS	ALWAYS	e.g. "Canon^Tarou=観音^太郎=キヤノン^タロウ""		
Patient ID	(0010,0020)	GENERATED; MWL;USER;SCANNED	ALWAYS	ALWAYS	e.g. "PAT20141002-0001"		
Patient's Birth Date	(0010,0030)	MWL;USER	ALWAYS	ALWAYS	e.g. "20001231"		
Patient's Sex	(0010,0040)	MWL;USER	ALWAYS	ALWAYS	e.g. "M"		

Table A-25 General Study Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Study Instance UID	(0020,000d)	GENERATED; MWL	ALWAYS	ALWAYS			
Study Date	(0008,0020)	GENERATED	ALWAYS	ALWAYS	e.g. "20241002"		
Study Time	(0008,0030)	GENERATED	ALWAYS	ALWAYS	e.g. "093915"		
Referring Physician's Name	(0008,0090)	MWL;USER	ALWAYS	ALWAYS	e.g. "Nasu^Jirou"		
Study ID	(0020,0010)	GENERATED	ALWAYS	ALWAYS	e.g. "4623"		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Accession Number	(0008,0050)	GENERATED; MWL;USER;SCANNED	ALWAYS	ALWAYS	e.g. "20241002-031"		
Study Description	(0008,1030)	MWL;USER	ALWAYS	ALWAYS	e.g. "Study Description"		

Table A-26 SR Document Series Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	e.g. "SR"		
Series Instance UID	(0020,000e)	GENERATED	ALWAYS	ALWAYS			
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS	e.g. "11"		
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS	e.g. "20241002"		
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS	e.g. "094108"		
Protocol Name	(0018,1030)	CONFIGURATION;USER	ALWAYS	ALWAYS	e.g. "Upper GI"		

Table A-27 General Equipment Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	e.g. "CANON_MEC"		
Station Name	(0008,1010)	CONFIGURATION;MWL	ALWAYS	ALWAYS	e.g. "Room 1"		
Manufacturer's Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	e.g. "PDR-05A"		
Device Serial Number	(0018,1000)	CONFIGURATION	ALWAYS	ALWAYS	e.g. "W4C2318642"		
Software Versions	(0018,1020)	FIXED	ALWAYS	ALWAYS	e.g. "V1.0 SP0000*"		

Table A-28 SR Document General Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	e.g. "1"		
Completion Flag	(0040,a491)	GENERATED	ALWAYS	ALWAYS	e.g. "PARTIAL"		
Verification Flag	(0040,a493)	GENERATED	ALWAYS	ALWAYS	e.g. "UNVERIFIED"		
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS	e.g. "20241002"		
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS	e.g. "094108"		
Performed Procedure Code Sequence	(0040,a372)	GENERATED	ALWAYS	ALWAYS			

Table A-29 SR Document Content Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Value Type	(0040,a040)	GENERATED	ALWAYS	ALWAYS	e.g. "CONTAINER"		
Concept Name Code Sequence	(0040,a043)	GENERATED	ALWAYS	ALWAYS			
> Code Value	(0008,0100)	GENERATED	ALWAYS	ALWAYS	e.g. "113701"		
> Coding Scheme Designator	(0008,0102)	GENERATED	ALWAYS	ALWAYS	e.g. "DCM"		
> Code Meaning	(0008,0104)	GENERATED	ALWAYS	ALWAYS	e.g. "X-Ray Radiation Dose Report"		
Continuity Of Content	(0040,a050)	GENERATED	ALWAYS	ALWAYS	e.g. "SEPARATE"		
Content Template Sequence	(0040,a504)	GENERATED	ALWAYS	ALWAYS	See Annex B for encoding on supported TIDs		
> Mapping Resource	(0008,0105)	GENERATED	ALWAYS	ALWAYS	e.g. "DCMR"		
> Template Identifier	(0040,db00)	GENERATED	ALWAYS	ALWAYS	e.g. "10001"		
Content Sequence	(0040,a730)	GENERATED	ALWAYS	ALWAYS			

Table A-30 SOP Common Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	GENERATED	ALWAYS	ALWAYS	e.g. "1.2.840.10008.5.1.4.1.1.88.67"		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS			
Specific Character Set	(0008,0005)	CONFIGURATION	ALWAYS	ALWAYS	e.g. "\ISO 2022 IR 87"		
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	e.g. "1"		

Table A-31 Standard Extended Module for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Other Patient IDs	(0010,1000)	MWL;USER	ALWAYS	EMPTY			
Body Part Examined	(0018,0015)	USER	ALWAYS	EMPTY			
Continuity Of Content	(0040,a050)	GENERATED	ALWAYS	EMPTY			

A.3.2 X-Ray Radiation Dose SR IOD Functional Group Macros - N/A

N/A

A.3.3 X-Ray Radiation Dose SR IOD Private Modules - N/A

N/A

A.3.4 X-Ray Radiation Dose SR IOD Coded Values

Table below lists Coded Values referenced from the "Value" column of the tables above for X-Ray Radiation Dose SR IOD:

Table A-32 Values and Code Sets for X-Ray Radiation Dose SR IOD

Attribute Name	Tag	Value/Code	Condition	Comments
Body Part Examined	(0018,0015)	SKULL		
		CSPINE		
		TSPINE		
		LSPINE		
		SSPINE		
		COCCYX		
		CHEST		
		CLAVICLE		
		BREAST		
		ABDOMEN		
		PELVIS		
		HIP JOINT		
		SHOULDER		
		ELBOW		
		KNEE		
		ANKLE		
		HAND		
		FOOT		
		EXTREMITY		
		HEAD		
		HEART		
		NECK		
		LOWER LEG		
		FOREARM		
		UPPER ARM		
		JAW		

A.4 Basic Directory IOD

Table A-62 defines the structure of the Basic Directory IOD.

Table A-33 Basic Directory IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
File Set identification Module							
File-set ID	(0004,1130)	GENERATED	ALWAYS	ALWAYS	e.g. "IDENTIFIER"		
Directory Information Module							
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	GENERATED	ALWAYS	ALWAYS	e.g. 378		
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	GENERATED	ALWAYS	ALWAYS	e.g. 378		
File-set Consistency Flag	(0004,1212)	GENERATED	ALWAYS	ALWAYS	e.g. 0		
Directory Record Sequence	(0004,1220)	GENERATED	ALWAYS	ALWAYS			
>Offset of the Next Directory Record	(0004,1400)	GENERATED	ALWAYS	ALWAYS	e.g. 0		
>Record In-use Flag	(0004,1410)	GENERATED	ALWAYS	ALWAYS	e.g. 65535		
>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	GENERATED	ALWAYS	ALWAYS	e.g. 586		
>Directory Record Type	(0004,1430)	GENERATED	ALWAYS	ALWAYS	e.g. "PATIENT";"STUDY"; "SERIES";"IMAGE","SR DOCUMENT"		
>Referenced File ID	(0004,1500)	GENERATED	ALWAYS	ALWAYS	e.g. "I00000000"		
>Referenced SOP Class UID in File	(0004,1510)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "1.2.840.10008.5.1.4.1.1.12.2"		
>Referenced SOP Instance UID in File	(0004,1511)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Referenced Transfer Syntax UID in File	(0004,1512)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "1.2.840.10008.1.2.1"		
"PATIENT" Keys							
>Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "\ISO 2022 IR 87"		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Patient's Name	(0010,0010)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "Canon^Tarou=観音^太郎=キヤノン^タロウ""		
>Patient ID	(0010,0020)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "PAT20141002-0001"		
>Patient's Birth Date	(0010,0030)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "20001231"		
>Patient's Sex	(0010,0040)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "M"		
"STUDY" Keys							
>Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "\ISO 2022 IR 87"		
>Study Date	(0008,0020)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "20241002"		
>Study Time	(0008,0030)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "093915"		
>Accession Number	(0008,0050)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "20241002-031"		
>Study Description	(0008,1030)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "Study Description"		
>Study Instance UID	(0020,000d)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Study ID	(0020,0010)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "4623"		
"SERIES" Keys							
>Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "\ISO 2022 IR 87"		
>Series Date	(0008,0021)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "20241002"		
>Series Time	(0008,0031)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "093716"		
>Modality	(0008,0060)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "RF"		
>Series Description	(0008,103e)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. ""		
>Series Instance UID	(0020,000e)	SRC_INSTANCE	SRC_COPY	SRC_COPY			
>Series Number	(0020,0011)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "1"		
"IMAGE" Keys							
>Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "\ISO 2022 IR 87"		
>Instance Number	(0020,0013)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "1"		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
"SR DOCUMENT" Keys							
>Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "\ISO 2022 IR 87"		
>Instance Number	(0020,0013)	SRC_INSTANCE	SRC_COPY	SRC_COPY	e.g. "1"		

B Structured Report Content Encoding

This section provides the detailed content encoding for all TIDs supported by SREX-D32C Aitella.

Throughout the tables listed in Annex B the following codes are used for the "Source" and "Presence of Content Item" columns.

In the "Source" column, the following Values can be used:

- FIXED: The Value is pre-defined and cannot be modified.
- GENERATED: The Value is generated by the system.
- CONFIGURATION: The Value is copied from the system configuration.
- MWL: The Value is copied from a Modality Worklist entry.
- QUERY: The Value is determined by performing a query of any of the supported Query/Retrieve Services.
- USER: The Value is entered by the user.
- SCANNED: The Value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent with a zero-length Value.
- SRC_INSTANCE: The Value is copied from previously created/received SOP Instances.

In the "Presence of Content Item" the following Values can be used:

- ALWAYS: the module, functional group macro, Attributes or Value is always present.
- CONDITIONAL: the presence of the module, functional group macro, Attributes or Value is dependent on a condition. The condition must be listed in the "Comments" column.
- SRC_COPY: The presence of the Attributes and Values depends on the availability of these in the source instances, which are used for copying this information.
- EMPTY: The Attribute is present but without a Value (zero length).

B.1 Projection X-Ray Radiation Dose (TID 10001)

Table B-1 shows the encoding of content of a DICOM Projection X-Ray Radiation Dose (TID 10001).

Table B-1 Projection X-Ray Radiation Dose (TID 10001)

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
		CONTAINER	(113701, DCM, "X-Ray Radiation Dose Report")	GENERATED	ALWAYS		10001	
>	HAS CONCEPT MOD	CODE	(121058, DCM, "Procedure reported")	GENERATED	ALWAYS	(113704,DCM," Projection X-Ray")	10001	
>		TEXT	(121015, DCM, "Device Observer Model Name")	GENERATED	ALWAYS	"PDR-05A"	1004	
>	HAS OBS CONTEXT	CODE	(113705, DCM, "Scope of Accumulation")	GENERATED	ALWAYS	(113016,DCM," Performed Procedure Step")	10001	
>>	HAS PROPERTIES	UIDREF	(110180, DCM, "Study Instance UID")	GENERATED	ALWAYS		10001	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>		CONTAINER	(113702, DCM, "Accumulated X-Ray Dose Data")	GENERATED	ALWAYS		10002	
>>	HAS CONCEPT MOD	CODE	(113764, DCM, "Acquisition Plane")	GENERATED	ALWAYS	(113622,DCM,"Single Plane")	10002	
>>	CONTAINS	CONTAINER	(122505, DCM, "Calibration")	GENERATED	ALWAYS		10002	
>>>	HAS CONCEPT MOD	CODE	(113794, DCM, "Dose Measurement Device")	GENERATED	ALWAYS	(A-2C090,SRT,"Dosimeter")	10002	
>>>	CONTAINS	NUM	(122322, DCM, "Calibration Factor")	GENERATED	ALWAYS	"1" (1,UCUM,"no units")	10002	
>>>	CONTAINS	NUM	(113763, DCM, "Calibration Uncertainty")	GENERATED	ALWAYS	"1" (%,UCUM,"Percent")	10002	
>>>	CONTAINS	TEXT	(113724, DCM, "Calibration Responsible Party")	GENERATED	ALWAYS	"Calibration Responsible Party"	10002	
>>>	CONTAINS	DATETIME	(113723,DCM,"Calibration Date")	GENERATED	ALWAYS	"19800101010101"	10002*	
>>		NUM	(113726, DCM, "Fluoro Dose Area Product Total")	GENERATED	ALWAYS	"3.58353e-005" (Gy.m2,UCUM,"Gy.m2")	10004	
>>		NUM	(113728, DCM, "Fluoro Dose (RP) Total")	GENERATED	ALWAYS	"6.9716697e-004" (Gy,UCUM,"Gy")	10004	
>>		NUM	(113730, DCM, "Total Fluoro Time")	GENERATED	ALWAYS	"20.9" (s,UCUM,"s")	10004	
>>		NUM	(113727, DCM, "Acquisition Dose Area Product Total")	GENERATED	ALWAYS	"1.261977e-004" (Gy.m2,UCUM,"Gy.m2")	10004	
>>		NUM	(113729, DCM, "Acquisition Dose (RP) Total")	GENERATED	ALWAYS	"4.1713e-005" (Gy,UCUM,"Gy")	10004	
>>		NUM	(113855, DCM, "Total Acquisition Time")	GENERATED	ALWAYS	"0.336600007" (s,UCUM,"s")	10004	
>>		NUM	(113722, DCM, "Dose Area Product Total")	GENERATED	ALWAYS	"1.62033e-004" (Gy.m2,UCUM,"Gy.m2")	10007	
>>		NUM	(113725, DCM, "Dose (RP) Total")	GENERATED	ALWAYS	"7.3887997e-004" (Gy,UCUM,"Gy")	10007	
>>		NUM	(113731, DCM, "Total Number of	GENERATED	ALWAYS	"17" (1,UCUM,"no units")	10007	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
			Radiographic Frames")					
>>		CODE	(113780, DCM, "Reference Point Definition")	GENERATED	ALWAYS	(113863,DCM,"30cm above Tabletop")	10007	
>>		NUM	(113731, DCM, "Total Number of Radiographic Frames")	GENERATED	ALWAYS	"17" (1,UCUM,"no units")	10006	
>>		NUM	(113722, DCM, "Dose Area Product Total")	GENERATED	ALWAYS	"1.62033e-004" (Gy.m2,UCUM,"Gy.m2")	10006	
>		CONTAINER	(113706, DCM, "Irradiation Event X-Ray Data")	GENERATED	ALWAYS		10003	
>>	HAS CONCEPT MOD	CODE	(113764, DCM, "Acquisition Plane")	GENERATED	ALWAYS	(113622,DCM,"Single Plane")	10003	
>>	CONTAINS	UIDREF	(113769, DCM, "Irradiation Event UID")	GENERATED	ALWAYS		10003	
>>	CONTAINS	DATETIME	(111526, DCM, "DateTime Started")	GENERATED	ALWAYS	"20241002093935"	10003	
>>	CONTAINS	CODE	(113721, DCM, "Irradiation Event Type")	GENERATED	ALWAYS	(113611,DCM,"Stationary Acquisition")	10003	
>>	CONTAINS	TEXT	(125203, DCM, "Acquisition Protocol")	GENERATED	ALWAYS	"DR"	10003	
>>	CONTAINS	NUM	(122130, DCM, "Dose Area Product")	GENERATED	ALWAYS	"1.8522e-005" (Gy.m2,UCUM,"Gy.m2")	10003	
>>	CONTAINS	CODE	(113780, DCM, "Reference Point Definition")	GENERATED	ALWAYS	(113863,DCM,"30cm above Tabletop")	10003	
>>		IMAGE	(113795, DCM, "Acquired Image")	GENERATED	ALWAYS		10003A	
>>		NUM	(113738, DCM, "Dose (RP)")	GENERATED	ALWAYS	"1.074e-005" (Gy,UCUM,"Gy")	10003B	
>>		CODE	(113780, DCM, "Reference Point Definition")	GENERATED	ALWAYS	(113863,DCM,"30cm above Tabletop")	10003B	
>>		CODE	(113732, DCM, "Fluoro Mode")	GENERATED	ALWAYS	(113630,DCM,"Continuous")	10003B	
>>		NUM	(113742, DCM, "Irradiation Duration")	GENERATED	ALWAYS	"6.2900002e-002" (s,UCUM,"s")	10003B	
>>		NUM	(113733, DCM, "KVP")	GENERATED	ALWAYS	"82" (kV,UCUM,"kV")	10003B	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>		NUM	(113734, DCM, "X-Ray Tube Current")	GENERATED	ALWAYS	"100" (mA,UCUM,"mA")	10003B	
>>		NUM	(113824, DCM, "Exposure Time")	GENERATED	ALWAYS	"62.900002" (ms,UCUM,"ms")	10003B	
>>		NUM	(113790, DCM, "Collimated Field Area")	GENERATED	ALWAYS	"4.500000179e-002" (m2,UCUM,"m2")	10003B	
>>	CONTAINS	NUM	(113737,DCM,"Distance Source to Reference Point")	GENERATED	ALWAYS	"700" (mm,UCUM,"mm")	10003B*	
>	CONTAINS	CODE	(113854, DCM, "Source of Dose Information")	GENERATED	ALWAYS	(113856,DCM," Automated Data Collection")	10001	
>	CONTAINS	CODE	(123014,DCM,"Target Region")	GENERATED	ALWAYS	(122494005,SCT,"Cervical spine")	10001*	
>>	HAS CONCEPT MOD	CODE	(G-C0E8,SRT,"Has Intent")	GENERATED	ALWAYS	(R-408C3,SRT,"Diagnostic Intent")	*	

B.1.1 Code Sets

The following tables list specific code sets referenced from the Projection X-Ray Radiation Dose (TID 10001)

Table B-2 Projection X-Ray Radiation Dose (TID 10001) – Irradiation Event Type

Coding Scheme Designator	Code Value	Code Meaning
SRT	P5-06000	Fluoroscopy
DCM	113611	Stationary Acquisition

Table B-3 Projection X-Ray Radiation Dose (TID 10001) – Target Region

Coding Scheme Designator	Code Value	Code Meaning
SCT	Skull	89546000
SCT	Cervical spine	122494005
SCT	Thoracic spine	122495006
SCT	Lumbar spine	122496007
SCT	Sacrum	54735007
SCT	Coccyx	64688005
SCT	Chest	816094009
SCT	Clavicle	51299004
SCT	Breast	76752008
SCT	Abdomen	818981001
SCT	Pelvis	816092008

Coding Scheme Designator	Code Value	Code Meaning
SCT	hip joint	24136001
SCT	Shoulder	16982005
SCT	Elbow joint	16953009
SCT	Knee	72696002
SCT	Ankle join	70258002
SCT	Hand	85562004
SCT	Foot	56459004
SCT	Extremity	66019005
SCT	Head	69536005
SCT	Heart	80891009
SCT	Neck	45048000
SCT	Lower leg	30021000
SCT	Forearm	14975008
SCT	Upper arm	40983000
SCT	Jaw region	661005

C Security Details

This section provides additional details about security features that are formally described in Section 8.

C.1 External Network Requirement Details - N/A

N/A

C.2 DICOM Security Profile Details

C.2.1 Online Electronic Storage Secure Use - N/A

N/A

C.2.2 Audit Trail Messages - N/A

N/A

C.2.3 Audit Trail Message Transmission Profile - SYSLOG - TLS - N/A

N/A

C.2.4 Audit Trail Message Transmission Profile - SYSLOG - UDP - N/A

N/A

C.2.5 Secure Transport Connection Details - N/A

N/A

C.2.6 Attribute Confidentiality Details

Table C-4 provides the list of Attributes and the action when de-identifying instances. Supported Action Codes are defined in PS 3.15 Section E.1.

- D: replace with a non-zero length Value that may be a dummy Value and consistent with the VR
- Z: replace with a zero-length Value, or a non-zero length Value that may be a dummy Value and consistent with the VR
- X: remove
- K: keep (unchanged for non-sequence Attributes, cleaned for sequences)
- C: clean, that is replace with Values of similar meaning known not to contain identifying information and consistent with the VR
- U: replace with a non-zero length UID that is internally consistent within a set of Instances
- Z/D: Z unless D is required to maintain IOD conformance (Type 2 versus Type 1)
- X/Z: X unless Z is required to maintain IOD conformance (Type 3 versus Type 2)
- X/D: X unless D is required to maintain IOD conformance (Type 3 versus Type 1)
- X/Z/D: X unless Z or D is required to maintain IOD conformance (Type 3 versus Type 2 versus Type 1)
- X/Z/U*: X unless Z or replacement of contained instance UIDs (U) is required to maintain IOD conformance (Type 3 versus Type 2 versus Type 1 sequences containing UID references)

Table C-4 De-identified Elements and Actions

Attribute Name	Tag	Action	Encrypted	Comments
Private Profile Option				
Patient's Name	(0010,0010)	D	N	e.g. "Unknown"
Patient ID	(0010,0020)	D		e.g. "PAT20141002-0001"

C.2.7 Digital Signature Details - N/A

N/A

C.2.8 Additional DICOM Security Profile Details - N/A

N/A

D Mapping of Attributes

D.1 Mapping Between Modality Worklist Instances and MPPS

Table D- describes the mapping of Attributes between Modality Worklist Instances and MPPS messages.

In the "Scenario" column the following Values are used:

- SCHEDULED: The image acquisition was scheduled at the RIS and procedure details have been communicated in the MWL query)
- UNSCHEDULED: The image acquisition was performed without Modality Worklist information
- APPEND: Instances acquired are added to an existing study after the initial procedure was finalized
- GROUP: Multiple requested procedures are grouped into one study.

In the "Value Source" columns, the following Values are used. The column cell may additionally contain an Attribute Tag if the value is copied from a different Attribute.

- GENERATED: The Value is generated by the system.
- SRC_INSTANCE: The Value is copied from previously created instances.
- MWL: The Value is copied from a Modality Worklist entry.
- USER: The Value is entered by the user.
- SCANNED: The Value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent with a zero-length Value.

The "Destination" columns either contain TOP, if the Attribute is added to the top level Data Set of the Instance, or contain the Attribute Tag of the Sequence the Attribute will be added to. The "Comments" column can be used to provide additional information regarding the Values added to the Instance or MPPS.

Table D-1 Mapping of Attributes from Modality Worklist to Instance and MPPS

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
Patient's Name	(0010,0010)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER	TOP	USER	TOP	
Patient ID	(0010,0020)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER	TOP	USER	TOP	
Patient's Birth Date	(0010,0030)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER	TOP	USER	TOP	
Patient's Sex	(0010,0040)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER	TOP	USER	TOP	
	(0008,0090)	SCHEDULED	MWL	TOP		--	

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
Referring Physician's Name		UNSCHEDULED	USER	TOP		--	
Study Instance UID	(0020,000D)	SCHEDULED	MWL	TOP	SRC_INSTANCE	(0040,0270)	
		UNSCHEDULED	GENERATED	TOP	EMPTY	(0040,0270)	
Accession Number	(0008,0050)	SCHEDULED	MWL	TOP	SRC_INSTANCE	(0040,0270)	
		UNSCHEDULED	EMPTY	TOP	EMPTY	(0040,0270)	
Requested Procedure ID	(0040,1001)	SCHEDULED	MWL	(0040,0275) [a] (0040,A370) [b]	SRC_INSTANCE	(0040,0270)	[a] for use in Image IODs [b] for use in Evidence Documents
		UNSCHEDULED	N/A	N/A	EMPTY	(0040,0270)	
Study ID	(0020,0010)	SCHEDULED	MWL (0040,1001)	TOP	SRC_INSTANCE	TOP	(0040,1001) is Requested Procedure ID
		UNSCHEDULED	GENERATED	TOP	SRC_INSTANCE	TOP	

E Code Set Usage - N/A