

DICOM Conformance Statement

SPECTsyngo

VA20



Product Name

Symbia Pro.specta Q3

Symbia Pro.specta X3

Symbia Pro.specta X7

1 Conformance Statement Overview

This conformance statement refers to **SPECTsyngo** the Siemens Healthineers CT acquisition workplace. Refer to **Figure 1: DICOM Data Flow diagram – Acquisition Workflow** and **Figure 2: DICOM Data Flow diagram - Printing** for an overview.

SPECTsyngo conforms to the DICOM Standard and supports the network services as described in Table 1: Network Services and the media services as described in Table 2 - Media Services.

Table 1: Network Services

Table 1: Network Services					
SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
Verification					
Verification	1.2.840.10008.1.1	Yes		Yes	
SOP Classes created by SPECTsyngo					
		Create	Send	Store	Display
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes	Yes	Yes
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Yes	Yes	Yes	Yes
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes	Yes	Yes
Raw Data Storage (see Note)	1.2.840.10008.5.1.4.1.1.66	Yes	Yes	Yes	Yes
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes	Yes	Yes
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes	Yes	Yes
Note: Raw Data Storage SOP Class for CT is only used internally and is not exposed externally. The SPECTsyngo stores and handles CT Raw Data in a proprietary format.					
SOP Classes managed by SPECTsyngo					
		Create	Send	Store	Display
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes	Yes	Yes
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes	Yes	Yes
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes	Yes	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes	Yes	Yes
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes	Yes	Yes
Digital Intra-Oral X-Ray Image - for Presentation - IMAGE	1.2.840.10008.5.1.4.1.1.1.3	No	Yes	Yes	Yes
Digital Intra-Oral X-Ray Image - for Processing - IMAGE	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	No	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes	Yes	Yes

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	No	Yes	Yes	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	No	Yes	Yes	Yes
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	No	Yes	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes	Yes	Yes
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	No	Yes	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	No	Yes	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	No	Yes	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	No	Yes	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes	Yes	Yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	No	Yes	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	No	Yes	Yes	Yes
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	No	Yes	Yes	Yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	No	Yes	Yes	Yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	No	Yes	Yes	Yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	No	Yes	Yes	Yes
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	No	Yes	Yes	Yes
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	No	Yes	Yes	Yes
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	No	Yes	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	No	Yes	Yes	Yes
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	No	Yes	Yes	Yes
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	No	Yes	Yes	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	No	Yes	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	No	Yes	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	No	Yes	Yes	Yes

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	No	Yes	Yes	Yes
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	No	Yes	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	No	Yes	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	No	Yes	Yes	Yes
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	No	Yes	Yes	Yes
Deformable Spatial Registration SOP Class	1.2.840.10008.5.1.4.1.1.66.3	No	Yes	Yes	Yes
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	No	Yes	Yes	Yes
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	No	Yes	Yes	Yes
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	No	Yes	Yes	Yes
Procedure Log Storage Storage	1.2.840.10008.5.1.4.1.1.88.40	No	Yes	Yes	Yes
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	No	Yes	Yes	Yes
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	No	Yes	Yes	Yes
Radiopharmaceutical Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.68	No	Yes	Yes	Yes
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	No	Yes	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	No	Yes	Yes	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	No	Yes	Yes	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	No	Yes	Yes	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	No	Yes	Yes	Yes
Radio Therapy Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	No	Yes	Yes	Yes
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	No	Yes	Yes	Yes
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	No	Yes	Yes	Yes
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	No	Yes	Yes	Yes
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	No	Yes	Yes	Yes
Transfer (Private SOP Class)					
Syngo Non-Image Storage	1.3.12.2.1107.5.9.1	Yes		Yes	
Storage Commitment					
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes		Yes	
Worklist Management					
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes		No	
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes		No	
Query/Retrieve					
Patient Root Q/R Information Model - FIND	1.2.840.10008.3.1.2.3.3	No		No	
Patient Root Q/R - Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	No		No	

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Study Root Q/R - Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Q/R - Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Patient/Study Only Q/R - Information Model FIND	1.2.840.10008.5.1.4.1.2.2.1	No	No
Patient/Study Only Q/R - Information Model MOVE	1.2.840.10008.5.1.4.1.2.3.2	No	No
Print Management			
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
Print Job SOP Class	1.2.840.10008.5.1.1.14	Yes	No
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No

Table 2 - Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk - Recordable		
STD-GEN-CD	Yes	Yes
AUG-GEN-CD	Yes	Yes
DVD		
AUG-GEN-DVD	Yes	Yes
AUG- GEN-DVD-J2K	Yes	Yes
STD-GEN-DVD	Yes	Yes
STD-GEN-DVD-J2K	Yes	Yes
Blu-Ray		
AUG-GEN-BD	Yes	Yes
AUG- GEN-BD-J2K	Yes	Yes
STD-GEN-BD	Yes	Yes
STD-GEN-BD-J2K	Yes	Yes
USB		
AUG- GEN-USB-J2K	Yes	Yes
STD-GEN-USB-J2K	Yes	Yes

SPECTsyngo creates ISO files to be burnt by local burning SW (if hardware and software are available). Therefore, it is only possible to update DICOMDIRs before the burning process has been started. When selecting the 'Standard' profile from the export UI, the export job will be handled according to the STD-GEN-XXX profile; depending on which media has been selected. In case the 'Patient' profile is selected, the STD-GEN-XXX-J2K profile will be used, depending on which media or destination has been selected.

Table 3 - Implementation Identifying Information

Name	Value
Application Context Name	1.2.840.100008.3.1.1.1
Implementation Class UID	1.3.12.2.1107.5.1.7
Implementation Version Name	SIEMENS_S10VA40A or SPECTSYNGO_VA20A (NM or PET)

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3 Introduction

3.1 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.2 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between **SPECTsyngo** and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM PS3.1-3.20 2021e 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 is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

The comparison of conformance statements is the first step towards assessing interconnectivity and interoperability between **SPECTsyngo** and other DICOM conformant equipment.

Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

Siemens reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens representative for the most recent product information.

3.3 Definitions, Terms and Abbreviations

Definitions, terms, and abbreviations used in this document are defined within the different parts of the DICOM standard.

Additional Abbreviations and terms are as follows:

AE	DICOM Application Entity
AET	Application Entity Title
ASCII	American Standard Code for Information Interchange
DCS	DICOM Conformance Statement
DICOM	Digital Imaging and Communications in Medicine
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater
GSDF	Grayscale Standard Display Function
IOD	DICOM Information Object Definition
ISO	International Standard Organization
n. a.	not applicable
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
SCU	DICOM Service Class User (DICOM client)

SCP	DICOM Service Class Provider (DICOM Server)
SOP	DICOM Service-Object Pair
SR	Structured Report
TFT	Thin Film Transistor (Display)
TID	Template ID
U	Unique Key Attribute
UID	Unique Identifier
UTF-8	Unicode Transformation Format-8
VR	Value Representation

Further DICOM related abbreviations used in this document can be found in [1]

3.4 References

- [1] Digital Imaging and Communications in Medicine, National Electrical Manufacturers Association (NEMA), <https://www.dicomstandard.org/> /
- [2] Integrating the Healthcare Enterprise – IHE Radiology Technical Framework, <http://www.ihe.net>
- [3] DICOM Conformance Statement – syngo.via VB60A, <https://www.siemens-healthineers.com/services/it-standards/dicom-conformance-statements-digital-and-automation/syngo-via>

4 Networking

4.1 Implementation Model

SPECTsyngo supports storing DICOM images to remote nodes like workstations or Archiving Systems. Using the Storage Commitment Service, it can request safe keeping of previously stored instances from an Archiving system. Additionally, the **SPECTsyngo** can query remote notes, retrieve and store selected instances from that node. Using the Modality Worklist service, the **SPECTsyngo** can query a HIS/RIS for scheduled procedures. Performed procedure status and other procedure data can be returned to the HIS/RIS using the Modality Performed Procedure Step (MPPS) Service. Furthermore, printing of color and grayscale images is supported.

4.1.1 Application Data Flow

The following figures provide a functional overview of the **SPECTsyngo** Application Entities (AE). Relationships are shown between user-invoked activities (in the circles at the left of the AEs) and the associated real-world activities provided by DICOM service providers (in the circles at the right of the AEs)

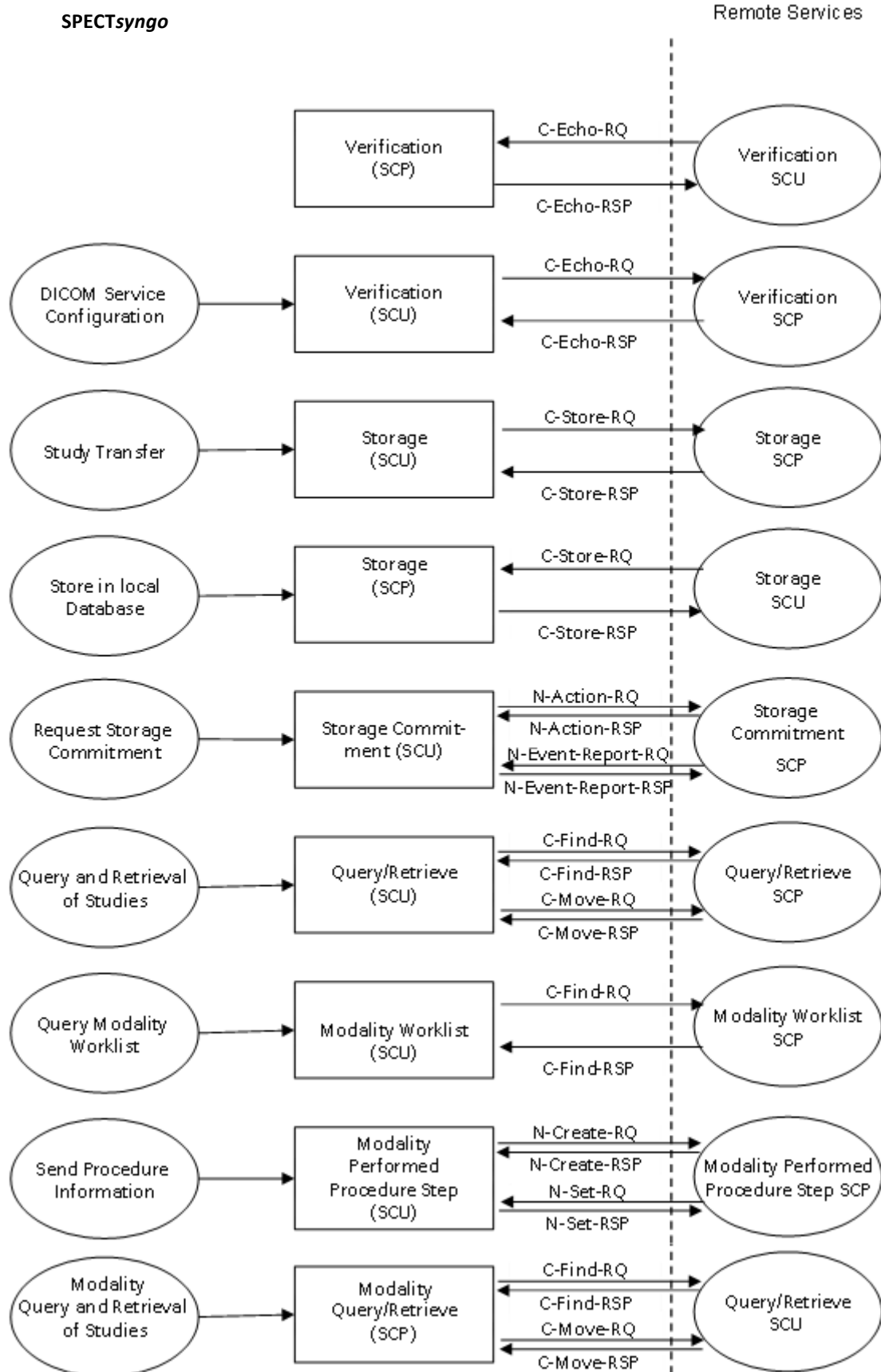


Figure 1: DICOM Data Flow diagram – Acquisition Workflow

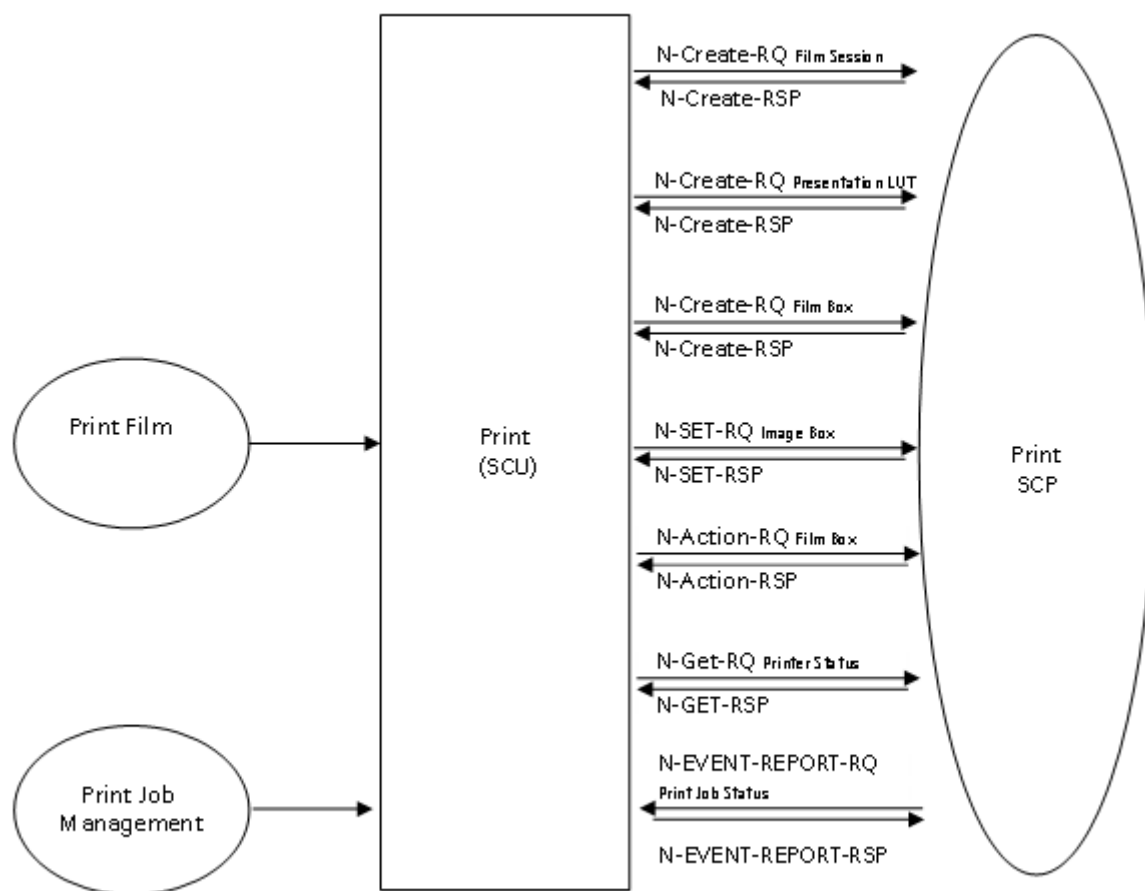


Figure 2: DICOM Data Flow diagram - Printing

4.1.2 Functional Definitions of Application Entities

The SCP components of the Application Entities of the operate as background server processes. They exist as soon as the system is powered up and wait for association requests. Upon accepting an association with a negotiated Presentation Context they start to receive and process the requests described in the following sections.

The SCU components of the Application Entity are invoked upon requests from the user interface or indirect by trigger from internal processes.

4.1.2.1 Functional Definition of Verification AE

The **SPECTsyngo** supports the Verification service as a SCP and SCU. As a SCU, Verification can be activated from the Administrator Portal during system configuration by sending a C-ECHO-Request.

As a SCP of the Verification Service the processes and responds to incoming verification requests using the C-ECHO-Response.

4.1.2.2 Functional Definition of Storage AE

The **SPECTsyngo** Storage SCU is invoked either directly by the user, by an auto-archive trigger or internally by the Query/Retrieve Application Entity that is responsible for processing retrieve requests. The job consists of data describing the composite objects selected for storage and the destination Application Entity Title. An association is negotiated with the destination Application Entity and the image data is transferred using the C-STORE-Request. The transfer status is reported to the initiator of the Storage request.

The Storage SCP component of the **SPECTsyngo** starts to receive the Composite Objects and import them into the database after accepting an association with a negotiated Presentation Context. The system responds to the Storage Request immediately after reception of the Data.

4.1.2.3 Functional Definition of the Storage Commitment AE

If configured, the **SPECTsyngo** can serve as a SCU for the DICOM Storage Commitment service. Upon successful completion of a storage job, the system uses the N-ACTION-Request to request storage commitment from a remote DICOM storage commitment SCP. This can either be the same as the storage destination or a different system depending on the system configuration. Storage Commitment Requests are sent after a configurable delay after storing the objects. The **SPECTsyngo** can receive the N-EVENT-REPORT-Request on the same or a different association.

4.1.2.4 Functional Definition of Query/Retrieve AE

The **SPECTsyngo** supports DICOM Query/Retrieve as a SCU: The user can initiate a query to a remote node using the C-FIND-Request. After matching the specified keys, the remote Query/Retrieve SCP uses the C-FIND-Response to return the results of its search, which will be displayed to the user. Depending on user action the **SPECTsyngo** Query/Retrieve DICOM SCU sends a C-MOVE-Request to initiate a C-STORE sub-operation on the SCP to start an image transfer from remote Storage SCU (running on Query/Retrieve SCP) to the system's Storage SCP.

The **SPECTsyngo** supports the following query models:

- Study Root Query Model

Furthermore, the SCU services may issue relational queries, if supported by the remote Query/Retrieve SCP node and required by the querying Application.

The **SPECTsyngo** DICOM Query/Retrieve SCP accepts C-FIND Request, queries the local database based on the provided matching keys and returns the matches using the C-FIND-Response. Depending on further request from the remote Query/Retrieve SCU, the responds to C-MOVE-Requests by initiating a C-STORE sub-operation to send image objects to the Storage SCP of the querying system.

4.1.2.5 Functional Definition of Modality Worklist AE

The **SPECTsyngo** Modality Worklist SCU issues DICOM Modality Worklist requests using C-FIND-Requests. The results in the C-FIND-Response are stored in internal database. The provided Patient and Procedure information is used for patient registration prior to starting an exam.

4.1.2.6 Functional Definition of Modality Performed Procedure Step SCU AE

The **SPECTsyngo** MPPS SCU uses the N-CREATE-Request to inform an Information System that a procedure step is IN PROGRESS.

The **SPECTsyngo** MPPS SCU uses the N-SET-Request to inform the Information System about the finalization of the Procedure Step, using either a status of COMPLETED or DISCONTINUED.

4.1.2.7 Functional Definition of Print AE

The Print SCU of the **SPECTsyngo** is invoked by the user interface to setup film-sheet layout and whenever an image is ready to be printed on film. The Print SCU will hold and maintain all data needed to compile a complete film-sheet from the data (images, layout, configuration) received. Whenever a film-sheet is ready to print, the related data is used to supply the Information to the SOP Classes of the Print Management Service Class. A queue is maintained in order to intermediately store several film-sheets in case of resource problems on printer. The SCU will only supply and require the mandatory SOP Classes of the Print Management Service Class.

4.1.3 Sequencing of Activities

This section describes the sequencing of Real-World Activities performed by the **SPECTsyngo** Entities using a UML sequence diagram. Real-World Activities are depicted as vertical bars and arrows show the events exchanged between them

4.1.3.1 System Configuration

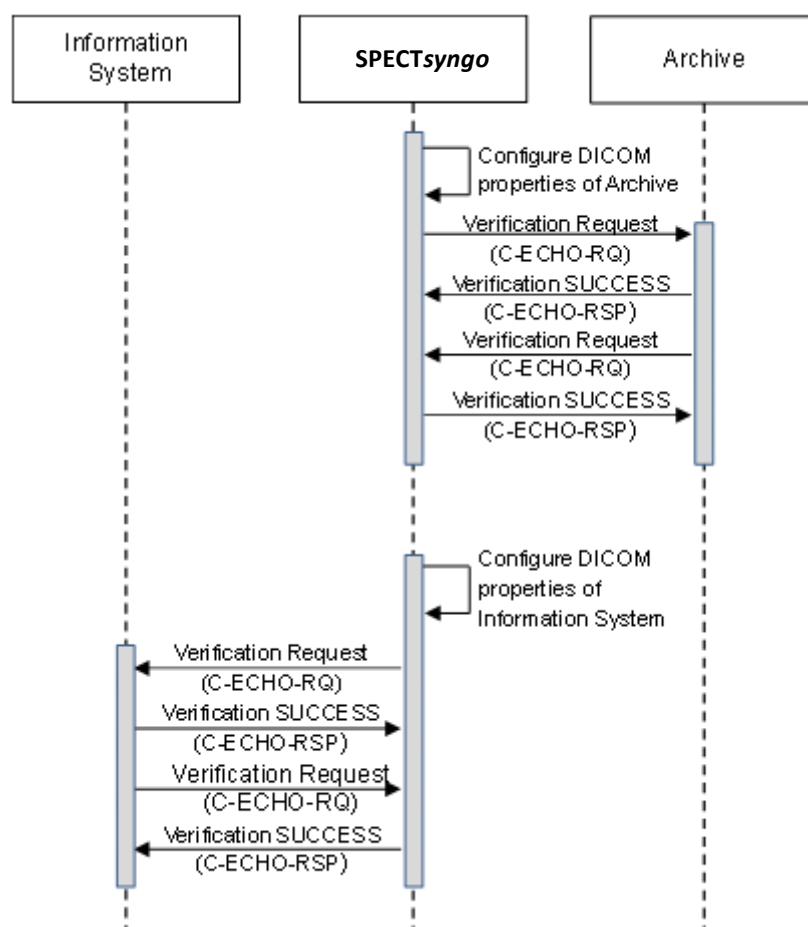


Figure 3: Sequence Diagram for Real World Activities - System Configuration

4.1.3.2 Acquisition Workflow

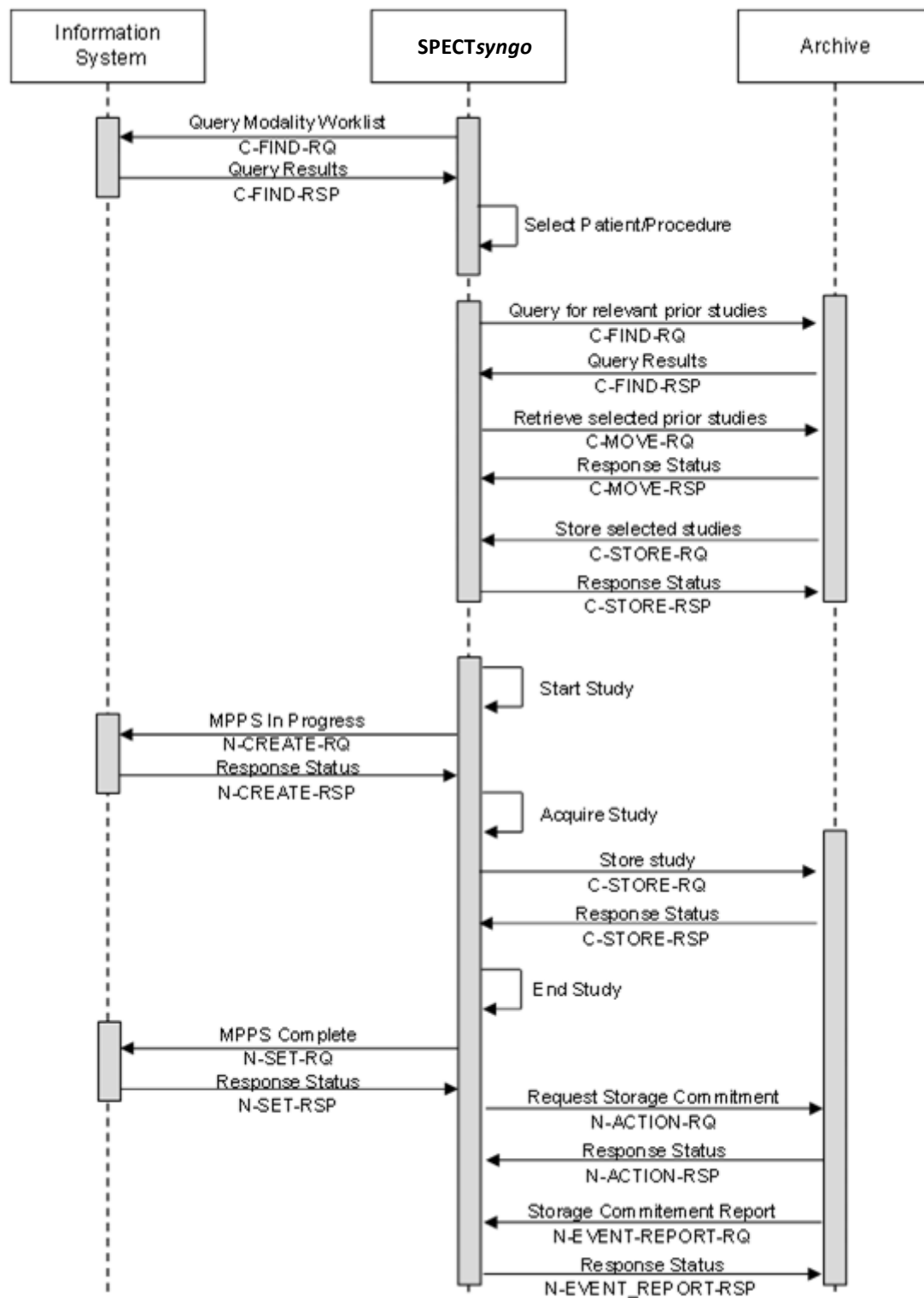


Figure 4: Sequence Diagram for Real World Activities -Acquisition workflow

4.1.3.3 Printing Workflow

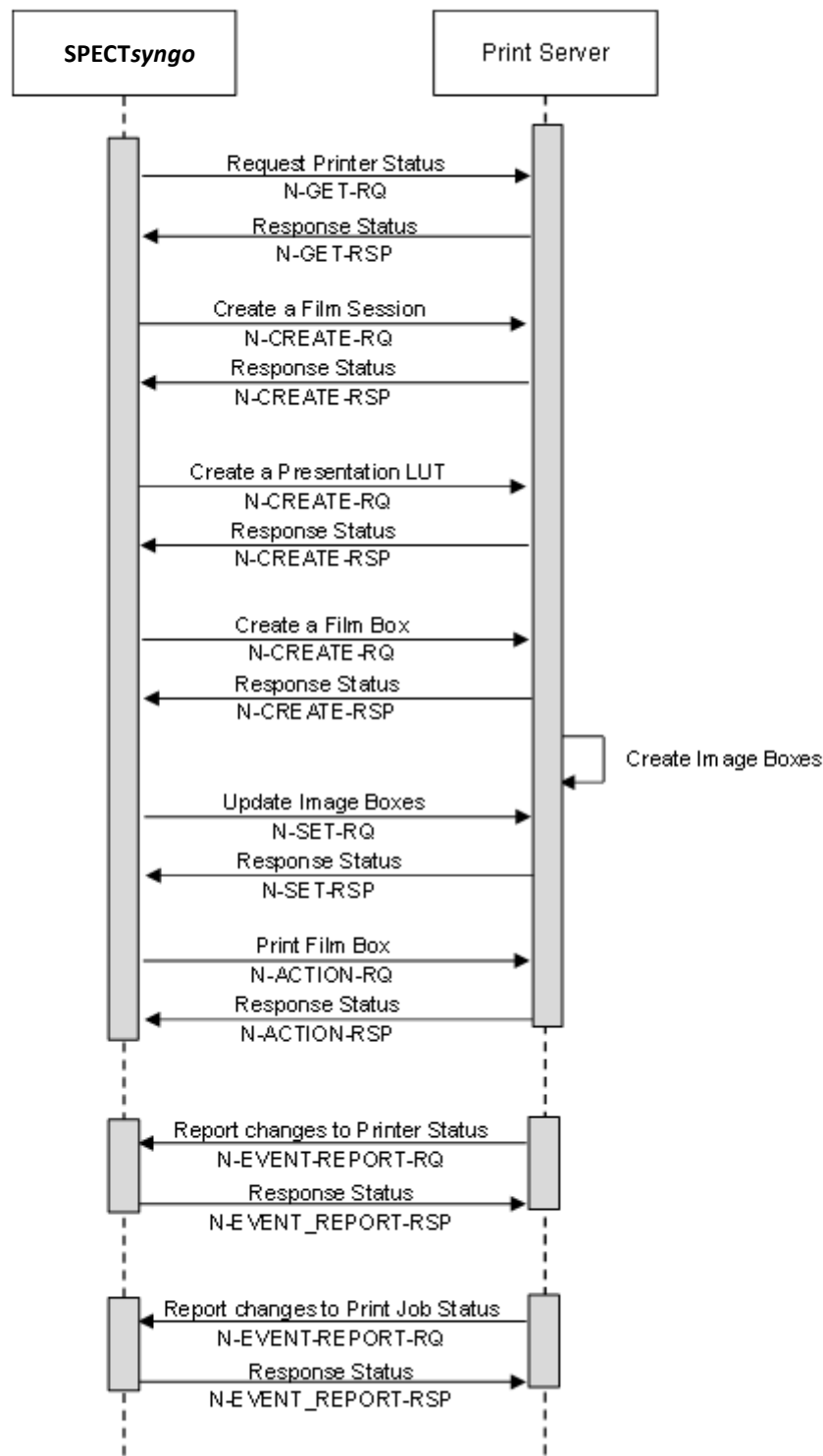


Figure 5: Sequence Diagram for Real World Activities - Printing

4.2 Application Entity Specification

This section outlines the specifications for each of the Application Entities that are part of the **SPECTsyngo**.

4.2.1 Verification AE Specification

4.2.1.1 SOP Classes

The Verification AE of the **SPECTsyngo** provides standard conformance to the Verification SOP Class listed in "Table 1: Network Services" section "Verification" in the "[Conformance Statement Overview](#)".

4.2.1.2 Association Policy

The **SPECTsyngo** Admin Portal attempts to open an association for verification request whenever the Verification function is activated.

Table 4: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB ¹
Maximum number of simultaneous associations as an association acceptor	12 ¹
Maximum number of simultaneous associations as an association initiator	unlimited

4.2.1.2.1 Asynchronous Nature

The **SPECTsyngo** supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any size is supported.

Table 5: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10
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4.2.1.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to "Table 3 - Implementation Identifying Information" in the "[Conformance Statement Overview](#)".

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – "Send Verification" Request

4.2.1.3.1.1 Description and Sequencing of Activity

The **SPECTsyngo** serves as a SCU of the Verification Service Class. A C-ECHO-Request is initiated by the Administrator Portal whenever "Verification" is requested. If an association to a remote Application Entity is successfully established, Verification with the configured AET is requested via the open association. If the

¹ Default, the value is configurable

C-ECHO Response from the remote Application contains a status other than "Success" this will be indicated to the user and the association is closed.

4.2.1.3.1.2 Proposed Presentation Contexts

Table 6 - Presentation Context Table "Verification" below lists the supported presentation contexts for verification requests.

Table 6 - Presentation Context Table "Verification"

Presentation Context Table – "Verification"					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.1.3 SOP Specific Conformance – Verification SCU

The ECHO-SCU provides standard conformance to the Verification Service Class.

4.2.1.4 Association Acceptance Policy

4.2.1.4.1 Activity – "Receive Verification Request"

4.2.1.4.1.1 Description and Sequencing of Activity

The **SPECTsyngo** serves as a SCP of the Verification Service Class. If the Verification SCP accepts an association, it will respond to C-ECHO-Requests. If the Called AE Title does not match any pre-configured AE Title shared by SCP, the association will be rejected.

4.2.1.4.1.2 Accepted Presentation Contexts

The **SPECTsyngo** DICOM application will accept Presentation Contexts as shown in the following table:

Table 7 - Presentation Context Table "Verification"

Presentation Context Table – "Verification"					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.1.4.1.3 SOP Specific Conformance – Verification SCP

The ECHO-SCP provides standard conformance to the Verification Service Class.

4.2.2 Storage AE Specification

4.2.2.1 SOP Classes

The Storage AE provides Standard Conformance to the the SOP Classes listed in "Table 1: Network Services" section "SOP Classes Created by the **SPECTsyngo** " and "SOP Classes Managed by the **SPECTsyngo** " in the "[Conformance Statement Overview](#)".

4.2.2.2 Association Policy

Table 8: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB ¹
Maximum number of simultaneous associations as an association acceptor	12 ¹
Maximum number of simultaneous associations as an association initiator	unlimited

The **SPECTsyngo** contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.2.2.1 Asynchronous Nature

The **SPECTsyngo** supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 9: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10
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4.2.2.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to "Table 3 - Implementation Identifying Information" in the "[Conformance Statement Overview](#)".

4.2.2.3 Association Initiation Policy

4.2.2.3.1 Activity – "Send Storage Request"

4.2.2.3.1.1 Description and Sequencing of Activities

¹ Default, the value is configurable

The **SPECTsyngo** serves as a SCU of the Storage Service Class. The Storage SCU is triggered by the transfer job queue or by an external retrieve request. An association request is sent to the destination AE. Upon successful negotiation of a Presentation Context, the transfer is started. Objects will be transferred sequentially on the same open association

4.2.2.3.1.2 Proposed Presentation Contexts

For all Image Objects listed in Table 1 in the Conformance Statement Overview the Transfer Syntaxes marked with “yes” in the Image Objects Column of the table below are supported.

For all Non-Image Objects listed in Table 1 in the Conformance Statement Overview the Transfer Syntaxes marked with “yes” in the Non-Image Objects Column of the table below are supported.

For a distinction between Image and Non-Image Objects please refer to the DICOM Standard PS3.3 Section A.1.4 “Overview of the Composite IOD Module Content” [1].

Table 10: Proposed Presentation Contexts for Storage

UID value	Transfer Syntax	Image Objects	Non-Image Objects
1.2.840.10008.1.2	Implicit Value Representation Little Endian native	yes	yes
1.2.840.10008.1.2.1	Explicit Value Representation Little Endian native	yes	yes
1.2.840.10008.1.2.2	Explicit Value Representation Big Endian	yes	yes
1.2.840.10008.1.2.4.50	JPEG Baseline (Process 1) lossy compressed	yes	no
1.2.840.10008.1.2.4.51	JPEG Extended (Process 2 & 4) lossy compressed	yes	no
1.2.840.10008.1.2.4.70	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14) lossless compressed	yes	no
1.2.840.10008.1.2.4.90	JPEG 2000 Image Compression (Lossless Only) compressed	yes	no
1.2.840.10008.1.2.4.91	JPEG 2000 Image Compression lossy compressed	yes	no
1.2.840.10008.1.2.5	RLE Lossless compressed	yes	no

Depending on the configuration, the Storage SCU will choose a compressed or uncompressed Transfer Syntax among those accepted by the SCP. The Transfer Syntax chosen is the preferred one among the compressed and uncompressed ones. The preference order is the order of occurrence in the configuration. For each node it is possible to select Transfer Syntaxes, that can be used, and Transfer Syntaxes, that are excluded. The configuration can even be extended, based on the combination of SOP Classes and supported Transfer Syntaxes.

An instance will be JPEG lossless compressed only if it fulfills the following criteria:

- It is an image and not already compressed
- Photometric Interpretation (0028,0004) is either MONOCHROME1, MONOCHROME2, RGB, YBR_FULL or YBR_FULL_422
- Bits Allocated (0028,0100) equal to ‘16 or ‘8’

- Bits Stored (0028,0101) equal to '12' or '8'
- High Bit (0028,0102) equal to Bits Stored (0028,0101) - 1
- Pixel Representation (0028,0103) equal to '0'

An instance will be JPEG lossy compressed during transfer only if the following criteria is fulfilled:

- Is an image
- Photometric Interpretation (0028,0004) is either MONOCHROME1, MONOCHROME2 or RGB
- Bits Allocated (0028,0100) equal to '16' or '8'
- Bits Stored (0028,0101) equal to '12' or '8'
- High Bit (0028,0102) equal to Bits Stored (0028,0101) - 1
- Pixel Representation (0028,0103) equal to '0'
- Only lossy transfer syntaxes are supported (Implicit Little Endian is not supported) at the remote side

An instance will be JPEG 2000 lossless compressed only if it fulfills the following criteria:

- It is an image and not already compressed
- Photometric Interpretation (0028,0004) is either MONOCHROME, RGB, YBR_FULL or YBR_FULL_422
- Bits Allocated (0028,0100) equal to '16' or '8'

An instance will be RLE lossless compressed only if it fulfills the following criteria:

- It is an image and not already compressed
- Photometric Interpretation (0028,0004) is MONOCHROME, RGB, YBR_FULL or RGB
- Bits Allocated (0028,0100) neither '16' nor '8'

An instance will be JPEG 2000 lossy compressed during transfer only if the following criteria is fulfilled:

- Is an image
- Photometric Interpretation (0028,0004) is MONOCHROME or RGB
- Bits Stored (0028,0101) equal to '12' or '8'
- Only lossy transfer syntaxes are supported (Implicit Little Endian is not supported) at the remote side

There is no extended negotiation as an SCU.

4.2.2.3.1.3 SOP specific Conformance for SOP classes

The **SPECTsyngo** does not add or change private attributes by default, even in case objects are compressed or the image header is updated according to IHE [2] Patient Information Reconciliation Profile.

The behavior of **SPECTsyngo** when encountering status codes in a C-STORE response is summarized in Table 11:

Table 11: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Any other DIMSE Error Status	Any none null Code	Send is continued till the end. Log message is created.
Success	Image is successfully stored	0000	If configured, Storage Commitment is requested for successfully stored instances

Table 12 below indicates the behavior if exceptions occur:

Table 12: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Log message is created (Timeout configurable; default 30s)
Association Aborted	Send is failed. Log message is created.

4.2.2.3.1.4 Correction and Rearrangement

When a Study is moved to a different:

- Procedure received through a DICOM Modality Worklist, the Study Instance UID is overwritten with the Study Instance UID and Accession Number of the Procedure.
- Patient, the system generates a new Study Instance UID.

The system will not update references to the changed Study Instance UIDs, therefore it is possible that there will be broken links between Studies after such move operations.

In case of Patient Merge and Correction no UIDs are changed, therefore it is advised to delete any corrected or rearranged objects from the PACS before attempting to archive them again, to ensure that the PACS system can store them successfully.

When the Patient Position (0018,5100) attribute is corrected, the following attributes are recalculated by the system (no UIDs are changed):

- 1) Image Position (0020,0032)
- 2) Image Orientation (0020,0037)
- 3) Patient Orientation (0020,0020)
- 4) Data Collection Center (Patient) (0018,9313) (CT only)
- 5) Reconstruction Target Center (Patient) (0018,9318) (CT only)
- 6) Positioner Primary Angle (0018,1510) (XA only)
- 7) Positioner Secondary Angle (0018,1511) (XA only)

Also, the value of the Slice Location (0020,1041) attribute is emptied, and a new Frame of Reference UID (0020,0052) is generated for the corrected series.

When the Patient Birth Date or the Study Date is corrected, the system recalculates the Patient Age.

A new item containing attributes that were removed or replaced by other values is added to the Original Attribute Sequence (0400,0561).

4.2.2.4 Association Acceptance Policy

4.2.2.4.1 Activity – “Receive Storage Request”

4.2.2.4.1.1 Description and Sequencing of Activities

The **SPECTsyngo** serves as a SCP of the Storage Service Class. The storage SCP accepts incoming C-Store Request from any configured AE Title, receives supported objects transmitted on that association and stores them in the local database.

4.2.2.4.1.2 Accepted Presentation Contexts

For all supported Transfer Objects (see "Table 1: Network Services" section "SOP Classes Created by the **SPECTsyngo**" and "SOP Classes Managed by the **SPECTsyngo**" in the "[Conformance Statement Overview](#)".) the Transfer Syntaxes described in Table 10: Proposed Presentation Contexts for Storage are supported.

Generally, all Presentation Contexts are accepted as long as they contain at least one suitable Transfer Syntax. All other Presentation Contexts are rejected.

There is no Extended Negotiation as an SCP

4.2.2.4.1.3 SOP-specific Conformance Statement for Storage SOP classes

The **SPECTsyngo** conforms to the Full Storage Class at Level 2.

In case of a successful C-STORE operation, the image has successfully been received in the negotiated transfer syntax.

The Storage AE of the **SPECTsyngo** returns the status "success" when the data is received, and a minimal image header validation has been performed.

The following header attributes must be available and filled:

- SOP Class UID,
- Study Instance UID,
- Series Instance UID and
- SOP Instance UID.

Table 13 below list the status codes that the **SPECTsyngo** can return:

Table 13: Storage C-STORE Response Status

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	Image received correctly (success notification is done after receiving, before indexing and storing)
Failure	Out-of-resource	A700	No resource left in the Short-Term Storage
Failure	Unable to Process	Cxxx	Error during instance reception
Failure	Data set does not match SOP Class	A9xx	The data set is not conformed to the SOP Class contained in the resource.

Restriction: Depending on response configuration successful operation does not guarantee storage on disk and storage of header data in the database.

4.2.2.4.1.4 Other SOP specific behavior

If an image is received that is already stored in the database - identified by the SOP Instance UID - the new image will be ignored. The existing instance is not superseded.

4.2.3 Storage Commitment AE Specification

4.2.3.1 SOP Classes

The Storage Commitment AE of the **SPECTsyngo** provides standard conformance to the SOP Class listed in "Table 1: Network Services" section "Storage Commitment" in the "[Conformance Statement Overview](#)".

4.2.3.2 Association Policy

Table 14: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB ¹
Maximum number of simultaneous associations as an association acceptor	12 ¹
Maximum number of simultaneous associations as an association initiator	unlimited

The **SPECTsyngo** contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.3.2.1 Asynchronous Nature

The **SPECTsyngo** supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 15: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10
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4.2.3.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to "Table 3 - Implementation Identifying Information" in the "[Conformance Statement Overview](#)".

¹ Default, the value is configurable

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity “Send Initial Storage Commitment”

4.2.3.3.1.1 Description and Sequencing of Activities

The **SPECTsyngo** serves as a SCU of the Storage Commitment Service Class. After successful transfer of Imaging Objects to a configured Archive, the Storage Commitment SCU initiates an N-Action Request, if Storage Commitment is configured. This request will be sent on a different association than the storage request.

The Storage Commitment Request will be sent out with a delay, in order to ensure that the remote node properly indexes received instances. The delay time is configurable with a default delay of 10 minutes.

The system may issue one N-ACTION Request for a complete set (bundle) of instances or issue one N-ACTION-Request per instance. This behavior is configurable; the default value is “bundled”.

The **SPECTsyngo** will accept the N-Event-Report-Request on the same association if sent immediately after the N-ACTION-Response. However, it will not wait for it. The association is closed after three seconds.

4.2.3.3.1.2 Proposed Presentation Contexts

The **SPECTsyngo** DICOM application supports the presentation contexts listed in the following table for the Storage Commitment Service Class.

Table 16: Proposed Presentation Contexts for Storage Commitment

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.3.3.1.3 SOP specific Conformance for SOP classes

The behavior of **SPECTsyngo** when encountering status codes in an N-ACTION response is summarized in Table 17:

Table 17: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Any failure that occurs	Any none null Code	Failure reported to user; corresponding object(s) will be marked as "Archived failed"
Success	All Instances are available on the remote node	0000	Success reported to user; in case failures exist, the corresponding instances will be marked as "Archived failed"

Table 18 below indicates the behavior if exceptions occur:

Table 18: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user (Timeout configurable; default 30s); the request will be retried
Association Aborted	Failure reported to user; the request will be retried

4.2.3.4 Association Acceptance Policy

4.2.3.4.1 Activity "Receive Reply to Initial Storage Commitment"

4.2.3.4.1.1 Description and Sequencing of Activities

The **SPECTsyngo** supports the reverse role negotiation of the Storage Commitment Service Class as the SCU. It accepts incoming N-EVENT-REPORT-Request, if they do not arrive on the same association as the N-ACTION-Request.

4.2.3.4.1.2 Accepted Presentation Contexts

The **SPECTsyngo** DICOM application supports the presentation contexts listed in the following table for the Storage Commitment Service Class.

Table 19 - Presentation Context Table "Update Flag Information"

Presentation Context Table – "Update Flag Information"					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.3.4.1.3 SOP-specific Conformance Statement for Storage Commitment SOP classes

The Storage Commitment SCU provides standard conformance to the Storage Commitment SOP Class.

4.2.4 Query/Retrieve AE Specification

4.2.4.1 SOP Classes

The Query/Retrieve AE provides Standard Conformance to the the SOP Classes listed in “Table 1: Network Services” section “Query/Retrieve” in the “[Conformance Statement Overview](#)”.

4.2.4.2 Association Policy

Table 20: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB ¹
Maximum number of simultaneous associations as an association acceptor	12 ¹
Maximum number of simultaneous associations as an association initiator	unlimited

The **SPECTsyngo** contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.4.2.1 Asynchronous Nature

The **SPECTsyngo** supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 21: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10
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4.2.4.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to “Table 3 - Implementation Identifying Information” in the “[Conformance Statement Overview](#)”.

4.2.4.3 Association Initiation Policy

4.2.4.3.1 Activity “Querying a Remote Node” for Instances

4.2.4.3.1.1 Description and Sequencing of Activities

The **SPECTsyngo** serves as a SCU for the following SOP Classes.

¹ Default, the value is configurable

- Patient Root Q/R Information Model – FIND SOP Class
- Study Root Q/R Information Model – FIND SOP Class
- Patient/Study only Q/R Information Model – FIND SOP Class.

Using the attributes specified by the user as Query Keys (in accordance with the query model) the Query SCU initiates a C-FIND Request and displays the responses to the user.

4.2.4.3.1.2 Proposed Presentation Contexts

The **SPECTsyngo** will propose Presentation Contexts as shown in the following table:

Table 22: Proposed Presentation Contexts for Query

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient/Study Only Query/ Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Table 23: Extended Negotiation as an SCU

Name	UID	Extended Negotiation
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Relational Query will be negotiated as defined in DICOM PS3.4 2016a.
Study Root Query/ Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Relational Query will be negotiated as defined in DICOM PS3.4 2016a.

4.2.4.3.1.3 SOP Specific Conformance Statement to Query SOP classes

The **SPECTsyngo** checks for the following status codes in the Query SCP's C-FIND-Response:

Table 24: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Failure	e.g. Out of Resources; Cancellation; Identifier does not match SOP Class; Unable to process	Any none null Code	Failure reported to user
Pending	All optional keys are supported the same manner as Required Keys.	FF00	Pending state is indicated to user
	Matching Operation continues; some of the optional keys were not supported the same way as the required keys	FF01	Pending state is indicated to user
Success	Query has been performed successfully.	0000	Success reported to user

Table 25: below indicates the behavior if exceptions occur:

Table 25: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

The **SPECTsyngo** supports the following query levels:

- Study
- Series

Matching Keys on Instance Level is not supported by the **SPECTsyngo** as SCU.

The following table lists the various attributes at Study and Series level, which can be used for hierarchical queries as well as return values for display. The display capabilities are highly configurable and "yes" indicates that it is possible to configure display of the data:

Table 26: Attributes supported for Study/Series Query - SCU

Attribute Name	Tag	Type	User input	UI
Study Level				
Patient's Name	(0010,0010)	O	enter value	yes
Patient ID	(0010,0020)	O	enter value	yes
Issuer of Patient ID	(0010,0021)	O	enter value	yes
Patient's Birth Date	(0010,0030)	O	enter value	yes
Patient's Birth Time	(0010,0032)	O	enter value	yes
Patient's Sex	(0010,0040)	O	enter value	yes
Accession Number	(0008,0050)	O	enter value	yes
Study ID	(0020,0010)	O	enter value	yes
Study Instance UID	(0020,000D)	U	enter value	yes
Study Date	(0008,0020)	O	enter value	yes

Attribute Name	Tag	Type	User input	UI
Study Time	(0008,0030)	O	enter value	yes
Referring Physician's Name	(0008,0090)	O	enter value	yes
Study Description	(0008,1030)	O	enter value	yes
Number of Study related Instances	(0020,1208)	O	-	yes
Modalities in Study	(0008,0061)	O	enter value	yes
Number of Study Related Series	(0020,1206)	O	-	yes
Series Level				
Modality	(0008,0060)	O	enter value	yes
Series Date	(0008,0021)	O	enter value	yes
Series Time	(0008,0031)	O	enter value	yes
Number of Series related Instances	(0020,1209)	O	-	yes
Series Number	(0020,0011)	O	enter value	yes
Series Description	(0008,103E)	O	enter value	yes
Request Attributes Sequence \ Re- quested Procedure ID	(0040,0275) \ (0040,1001)	O	enter value	yes
Request Attributes Sequence \ Sched- uled Procedure Step ID	(0040,0275) \ (0040,0009)	O	enter value	yes
Performed Procedure Step Start Date	(0040,0244)	O	enter value	yes
Performed Procedure Step Start Time	(0040,0245)	O	enter value	yes
Series Instance UID	(0020,000E)	U	-	yes

4.2.4.3.1 Activity “Retrieve Instances from a remote node”

4.2.4.3.1.1 Description and Sequencing of Activities

The **SPECTsyngo** serves as a SCU for the following SOP Classes

- Study Root Q/R Information Model – MOVE SOP Class

The C-MOVE-Request is used to retrieve the selected imaging objects. The Retrieve AE supports the query model Study Root.

4.2.4.3.1.2 Proposed Presentation Contexts

The **SPECTsyngo** proposes Presentation Contexts shown in the following table:

Table 27: Proposed Presentation Contexts for Retrieve and Activity “MOVE SCU”

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient/Study Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.4.3.1.3 SOP Specific Conformance Statement for Move SCU Classes

The behavior of **SPECTsyngo** when encountering status codes in a C-MOVE response is summarized in Table 28

Table 28: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	e.g. Out of Resources; Cancellation; Identifier does not match SOP Class; Unable to process; Move destination unknown	Any non null Code	Failure reported to user
Pending	Move Operation continues	FF00	Operation continues in background
Success	Move has been performed successfully.	0000	Success reported to user

Table 29 below indicates the behavior if exceptions occur:

Table 29: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

4.2.4.4 Association Acceptance Policy

The **SPECTsyngo** provides SCU and SCP functionality.

4.2.5 Modality Worklist AE Specification

4.2.5.1 SOP Classes

The Modality Worklist AE provides Standard Conformance to the the SOP Classes listed in “Table 1: Network Services” section “Worklist Management” in the [“Conformance Statement Overview”](#).

4.2.5.2 Association Policy

Table 30: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB ¹
Maximum number of simultaneous associations as an association acceptor	12 ¹
Maximum number of simultaneous associations as an association initiator	unlimited

The **SPECTsyngo** contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.5.2.1 Asynchronous Nature

The **SPECTsyngo** supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 31: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10
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4.2.5.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to “Table 3 - Implementation Identifying Information” in the [“Conformance Statement Overview”](#).

¹ Default, the value is configurable

4.2.5.3 Association Initiation Policy

4.2.5.3.1 Activity “Querying a Remote Node” for Modality Worklist

4.2.5.3.1.1 Description and Sequencing of Activities

The **SPECTsyngo** serves as a SCU of the Modality Worklist service. It performs worklist queries by issuing a C-FIND request at regular intervals. In addition a worklist request can be triggered manually.

4.2.5.3.1.2 Proposed Presentation Contexts

The **SPECTsyngo** will propose Presentation Contexts as shown in the following table:

Table 32: Proposed Presentation Contexts for Worklist

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Worklist-FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.5.3.1.3 SOP Specific Conformance for SOP Classes

Search Key Attributes of the Worklist C-FIND

The **SPECTsyngo** Modality Worklist SCU supports “broad worklist queries” with all required search keys. The following tables describe the “broad query” search keys that the SCU supports. The list is configurable in ‘DICOM Modality Worklist Query’.

Table 33: Broad Query search keys

Attribute Name	Tag	Matching Key Type	Query Value
Scheduled Procedure Step			
Scheduled Procedure Step Sequence	(0040,0100)	R	
>Modality	(0008,0060)	R	<configured byModality> or “*”
>Scheduled Station AE Title	(0040,0001)	R	<own AET> or “*” ¹
>Scheduled Procedure Step Start Date	(0040,0002)	R	Range from UI ²
>Scheduled Station Name	(0040,0010)	O	
>Scheduled Procedure Step Location	(0040,0011)	O	
>Scheduled Procedure Step Status	(0040,0020)	O	
>Scheduled Performing Physician’s Name	(0040,0006)	O	

¹ This depends on user configuration (Administration Portal->Technical Configuration->DICOM Nodes->Local DICOM Node->Worklist) if the “own AET” is provided or not.

² A time window can be configured by defining how many days to look into the past and into the future (Administration Portal-> Technical Configuration->DICOM Nodes->Local DICOM Node->Worklist)

Attribute Name	Tag	Matching Key Type	Query Value
Requested Procedure Description	(0032,1060)	O	
Requested Procedure Priority	(0040,1003)	O	
Patient Transport Arrangements	(0040,1004)	O	
Requested Procedure Comments	(0040,1400)	O	
Requested Procedure Code Sequence	(0032,1064)	O	
>Code Value	(0008,0100)	O	
Requesting Physician	(0032,1032)	O	
Referring Physicians Name	(0008,0090)	O	
Current Patient Location	(0038,0300)	O	
Pregnancy Status	(0010, 21C0)	O	
Medical Alerts	(0010,2000)	O	
Allergies	(0010,2110)	O	

Return Key Attributes of the Modality Worklist C-FIND

The **SPECTsyngo** Modality Worklist SCU supports worklist queries with return key attributes of all types. The following tables describe the return keys that the SCU supports.

An “yes” in the **UI** column indicates that the attribute may be visualized when browsing the Worklist results with the Browser. The Browser display is additionally influenced by the related Browser configuration.

Table 34: Modality Worklist C-Find Return keys

Attribute Name	Tag	Return Key Type	UI	Notes
SOP Common				
Specific Character Set	(0008,0005)	1C	-	
Scheduled Procedure Step				
Scheduled Procedure Step Sequence	(0040,0100)	1		
>Modality	(0008,0060)	1	yes	
>Scheduled Station AE Title	(0040,0001)	1		“Scheduled Station AE Title” is taken as default for “Performed Station AE Title”
>Scheduled Procedure Step Start Date	(0040,0002)	1	yes	
>Scheduled Procedure Step Start Time	(0040,0003)	1	yes	
>Scheduled Procedure Step End Date	(0040,0004)	3	-	
>Scheduled Procedure Step End Time	(0040,0005)	3	-	
>Scheduled Performing Physician’s Name	(0040,0006)	1	yes	“Scheduled Performing Physician’s Name” is taken as default for “Performing Physician’s Name”
>Scheduled Procedure Step Description	(0040,0007)	1C	yes	“Scheduled Procedure Step Description” is taken as default for “Performed Procedure Step Description”
>Scheduled Protocol Code Sequence **	(0040,0008)	1C	-	Uses universal sequence match “Scheduled Protocol Code Sequence” is taken as default for

Attribute Name	Tag	Re- turn Key Type	UI	Notes
				"Performed Protocol Code Sequence"
>>Code Value	(0008,0100)	1C	-	
>>Coding Scheme Designator	(0008,0102)	1C	-	
>>Coding Scheme Version	(0008,0103)	3	-	
>>Code Meaning	(0008,0104)	3	-	
>>Mapping Resource	(0008,0105)	3	-	
>>Context Group Version	(0008,0106)	3	-	
>>Context Group Local Version	(0008,0107)	3	-	
>>Context Group Extension Flag	(0008,010B)	3	-	
>>Context Group Extension Creator UID	(0008,010D)	3	-	
>>Context Identifier	(0008,010F)	3	-	
>Scheduled Procedure Step ID	(0040,0009)	1	yes	"Scheduled Procedure Step ID" is taken as default for "Performed Procedure Step ID"
>Scheduled Station Name	(0040,0010)	2	yes	
>Scheduled Procedure Step Location	(0040,0011)	2	-	"Scheduled Procedure Step Location" is taken as default for "Performed Location"
>Scheduled Procedure Step Status	(0040,0020)	3	-	
>Comments on the Scheduled Procedure Step	(0040,0400)	3	-	
Requested Procedure				
Study Date	(0008,0020)	3	-	
Study Time	(0008,0030)	3	-	
Referenced Study Sequence	(0008,1110)	2	-	Uses universal sequence match
>Referenced SOP Class UID	(0008,1150)	1C	-	
>Referenced SOP Instance UID	(0008,1155)	1C	-	
Study Instance UID	(0020,000D)	1	-	
Requested Procedure Description	(0032,1060)	1C	yes	
Requested Procedure Code Sequence	(0032,1064)	1C	-	Uses universal sequence match "Requested Procedure Code Sequence" is taken as default for "Procedure Code Sequence"
>Code Value	(0008,0100)	1C	-	
>Coding Scheme Designator	(0008,0102)	1C	-	
>Coding Scheme Version	(0008,0103)	3	-	
>Code Meaning	(0008,0104)	3	-	
>>Mapping Resource	(0008,0105)	3	-	
>>Context Group Version	(0008,0106)	3	-	
>>Context Group Local Version	(0008,0107)	3	-	
>>Context Group Extension Flag	(0008,010B)	3	-	
>>Context Group Extension Creator UID	(0008,010D)	3	-	
>>Context Identifier	(0008,010F)	3	-	
Requested Procedure ID	(0040,1001)	1	yes	"Requested Procedure ID" is taken as default for "Study ID"
Reason for the Requested Procedure	(0040,1002)	3	-	
Requested Procedure Priority	(0040,1003)	2	yes	
Patient Transport Arrangements	(0040,1004)	2	-	

Attribute Name	Tag	Re- turn Key Type	UI	Notes
Confidentiality Code	(0040,1008)	3	-	
Reporting Priority	(0040,1009)	3	yes	
Names of intended Recipients of Results	(0040,1010)	3	-	
Requested Procedure Comments	(0040,1400)	3	-	
Imaging Service Request				
Accession Number	(0008,0050)	2	yes	
Referring Physician's Name	(0008,0090)	2	yes	
Requesting Physician	(0032,1032)	2	yes	
Requesting Service	(0032,1033)	3	-	
Issuing Date of Imaging Service Request	(0040,2004)	3	-	
Issuing Time of Imaging Service Request	(0040,2005)	3	-	
Placer Order Number / Imaging Service Request	(0040,2016)	3	-	Old tag (0040,2006) is retired and not used.
Filler Order Number / Imaging Service Request	(0040,2017)	3	-	Old tag (0040,2007) is retired and not used.
Order entered by ...	(0040,2008)	3	-	
Order Enterer's location	(0040,2009)	3	-	
Order Callback Phone Number	(0040,2010)	3	-	
Imaging Service Request Comments	(0040,2400)	3	-	
Visit Identification				
Admission ID	(0038,0010)	2	yes	
Issuer of Admission ID	(0038,0011)	3	-	
Institution Name	(0008,0080)	3	-	
Institution Address	(0008,0081)	3	-	
Visit Status				
Current Patient Location	(0038,0300)	2	yes	
Visit Admission				
Admitting Diagnosis Description	(0008,1080)	3	yes	
Admitting Date	(0038,0020)	3	-	
Patient Identification				
Patient's Name	(0010,0010)	1	yes	
Patient ID	(0010,0020)	1	yes	
Issuer of Patient ID	(0010,0021)	3	-	
Other Patient IDs	(0010,1000)	3	yes	
Other Patient Names	(0010,1001)	3	yes	
Patient's Birth Name	(0010,1005)	3	-	
Patient Demographic				
Patient's Birth Date	(0010,0030)	2	yes	
Patient's Birth Time	(0010,0032)	3	-	
Patient's Sex	(0010,0040)	2	yes	
Patient's Insurance Plan Code Sequence	(0010,0050)	3	-	Uses universal sequence match
>Code Value	(0008,0100)	1C	-	
>Coding Scheme Designator	(0008,0102)	1C	-	
>Coding Scheme Version	(0008,0103)	3	-	
>Code Meaning	(0008,0104)	3	-	
Patient's Age	(0010,1010)	3	-	
Patient's Size	(0010,1020)	3	yes	
Patient's Weight	(0010,1030)	2	yes	
Patient's Address	(0010,1040)	3	yes	
Military Rank	(0010,1080)	3	yes	
Branch of Service	(0010,1081)	3	-	

Attribute Name	Tag	Re- turn Key Type	UI	Notes
Ethnic Group	(0010,2160)	3	yes	
Patient Comments	(0010,4000)	3	yes	
Patient Medical				
Medical Alerts	(0010,2000)	2	yes	
Allergies	(0010,2110)	2	yes	
Pregnancy Status	(0010,21C0)	2	yes	
Smoking Status	(0010,21A0)	3	yes	
Last Menstrual Date	(0010,21D0)	3	yes	
Additional Patient History	(0010,21B0)	3	yes	
Special Needs	(0038,0050)	2	yes	

The behavior of the **SPECTsyngo** when encountering status codes in a C-FIND response is summarized in Table 35:

Table 35: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	e.g. Out of Resources; Cancellation; Identifier does not match SOP Class; Unable to process	Any none null Code	Failure reported to user
Pending	All optional keys are supported the same manner as Required Keys.	FF00	Pending state is indicated to user
	Matching Operation continues; some of the optional keys were not supported the same way as the required keys	FF01	Pending state is indicated to user
Success	Query has been performed successfully.	0000	Success reported to user

Table 36 below indicates the behavior if exceptions occur:

Table 36: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

4.2.5.4 Association Acceptance Policy

The **SPECTsyngo** does not provide the functionality of a SCP of the Modality Worklist – Find SOP Class.

4.2.6 Modality Performed Procedure Step AE Specification

4.2.6.1 SOP Classes

The Modality Performed Procedure Step AE provides Standard Conformance to the the SOP Classes listed in “Table 1: Network Services” section “Worklist Management” in the “Conformance Statement Overview”.

4.2.6.2 Association Policy

Table 37: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB ¹
Maximum number of simultaneous associations as an association acceptor	12 ¹
Maximum number of simultaneous associations as an association initiator	unlimited

The **SPECTsyngo** contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.6.2.1 Asynchronous Nature

The **SPECTsyngo** supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 38: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10
--	----

4.2.6.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to “Table 3 - Implementation Identifying Information” in the “[Conformance Statement Overview](#)”.

4.2.6.3 Association Initiation Policy

4.2.6.3.1 Activity “Create Modality Performed Procedure Step”

4.2.6.3.1.1 Description and Sequencing of Activities

The **SPECTsyngo** serves as a SCU of the Modality Performed Procedure Step SOP Class. It sends N-CREATE request to inform the Information System that a Procedure Step has been started.

4.2.6.3.1.2 Accepted Presentation Contexts

The **SPECTsyngo** proposes Presentation Contexts as shown in the following table:

Table 39: Acceptable Presentation Contexts Activity “Create MPPS”

Presentation Context Table

¹ Default, the value is configurable

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.6.3.1.3 SOP specific Conformance for MPPS SOP class

The behavior of **SPECTsyngo** when encountering status codes in an N-CREATE-RSP response is summarized in Table 40:

Table 40: MPPS N-CREATE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	MPPS creation request could not be processed.	Any none null Code	MPPS is not created.
Success	MPPS creation request processed successfully.	0000	MPPS is created.

4.2.6.3.2 Activity “Update Modality Performed Procedure Step”

4.2.6.3.2.1 Description and Sequencing of Activities

When the procedure step has been finished, the **SPECTsyngo** sends N-SET request to inform the Information System about the finalization of the procedure step (COMPLETED or DISCONTINUED).

4.2.6.3.2.2 Proposed Presentation Contexts

The **SPECTsyngo** proposes Presentation Contexts as shown in the following table:

Table 41: Acceptable Presentation Contexts Activity “Update MPPS”

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.6.3.2.3 SOP specific Conformance for MPPS SOP class

The behavior of when encountering status codes in an N-SET-RSP response is summarized in Table 42:

Table 42: MPPS N-SET Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	MPPS update request could not be processed.	Any none null Code	MPPS is not updated.
Success	MPPS update request could processed successfully.	0000	MPPS is updated.

4.2.6.4 Association Acceptance Policy

The **SPECTsyngo** does not provide the functionality of a SCP of the Modality Performed Procedure Step SOP Class.

4.2.7 Print AE Specification

4.2.7.1 SOP Classes

The Print AE provides Standard Conformance to the the SOP Classes listed in “Table 1: Network Services” section “Print Management” in the “[Conformance Statement Overview](#)”.

4.2.7.2 Association Policy

Table 43: Association Policies

Application Context Name	1.2.840.10008.3.1.1.1
PDU size	32 kB ¹
Maximum number of simultaneous associations as an association acceptor	12 ¹
Maximum number of simultaneous associations as an association initiator	unlimited

The **SPECTsyngo** contains a limitation of 512 kB for the maximum PDU size. By default, the PDU size is set to 32kB.

The maximum number of simultaneous receiving associations (SCP) is configurable at run time, based on the system resources available. By default, the maximum number of associations is set to 12.

There is no inherent limit to the number of outgoing associations (SCU), other than limits imposed by the computer operating system.

4.2.7.2.1 Asynchronous Nature

The **SPECTsyngo** supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 44: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10
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4.2.7.3 Association Initiation Policy

4.2.7.3.1 Activity Print Film

4.2.7.3.1.1 Description and Sequencing of Activities

Whenever a film-sheet is prepared by the user, it is forwarded to the Printer Job queue. As soon as the associated Printer device is available the job is activated and an association is established.

¹ Default, the value is configurable

After the film sheet is internally processed, converted to a Standard/1,1 layout and the page image is sent to the printer, the status is controlled by awaiting any N-EVENT-REPORT message throughout the transfer until the last image or film-sheet is sent.

If the response from the remote application contains a status other than Success or Warning the printing is stopped and the job status is set to Aborted.

4.2.7.3.1.2 Proposed Presentation Context

The **SPECTsyngo** proposes Presentation Contexts as shown in the following table:

Table 45: Presentation Contexts for the Activity "Print Film"

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.3.1.3 SOP Specific Conformance

The **SPECTsyngo** Print SCU conforms to the DICOM Basic Grayscale Print Management Meta SOP Class and the Basic Color Print Management Meta SOP Class.

The application uses a configuration platform to define the properties of the connected DICOM SCP, e.g.:

- supported film sizes of the connected DICOM SCP
- supported film formats of the DICOM SCP

The printing is only suspended in the case of a failure return status of the SCP.

Basic Film Session SOP Class

The Basic Film Session information object definition describes all the user-defined parameters, which are common for all the films of a film session. The Basic Film Session refers to one or more Basic Film Boxes that are printed on one hardcopy printer.

The **SPECTsyngo** Print Management SCU supports the following DIMSE Service elements for the Basic Film Session SOP Class as SCU:

- N-CREATE
- N-DELETE

The Basic Film Session SOP Class N-CREATE-RQ (SCU) uses the attributes listed in the table below:

Table 46: Attributes for the N-CREATE-RQ of the Basic Film Session

Attribute Name	Tag	Usage SCU	Supported Values
Number of Copies	(2000,0010)	U	1
Medium Type	(2000,0030)	U	BLUE FILM
			CLEAR FILM
			PAPER
			MAMMO BLUE FILM
			MAMMO CLEAR FILM

The Affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Session.

The Basic Film Session SOP class interprets the status codes (from N-CREATE-RSP messages) listed in the table below:

Table 47: N-CREATE-RSP Status Handling Behavior for the Basic Film Session

Service Status	Further Meaning	Error Codes	Behavior
Warning	Memory Allocation not supported	B600	Print job continues, warning is logged
Success	Film session successfully created	0000	Print job continues

The N-DELETE-RQ on the Basic Film Session SOP Class is used to remove the complete Basic Film Session SOP Instance hierarchy.

Basic Film Box SOP Class

The Basic Film Box information object definition describes all user-defined parameters of one film of the film session including presentation parameters, which are common for all images on a given film sheet.

The Basic Film Box refers to one or more Image Boxes.

The **SPECTsyngo** Print Management SCU supports the following DIMSE Service elements for the Basic Film Box SOP Class as SCU:

- N-CREATE
- N-ACTION
- N-DELETE

The Basic Film Box SOP Class N-CREATE-RQ message uses the attributes listed below. The actual values for each attribute depend on DICOM printer configuration within the **SPECTsyngo** DICOM Print Management SCU:

Table 48: Attributes for the N-CREATE-RQ of the Basic Film Session

Attribute Name	Tag	Usage SCU	Supported Values
Image Display Format	(2010,0010)	M	STANDARD\1,1
Referenced Film Session Sequence	(2010,0500)	M	
> Referenced SOP Class UID	(0008,1150)	M	1.2.840.10008.5.1.1.1.1
> Referenced SOP Instance UID	(0008,1155)	M	
Film Orientation	(2010,0040)	M	PORTRAIT, LANDSCAPE
Film Size ID	(2010,0050)	M	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM
Magnification Type	(2010,0060)	M	BILINEAR, CUBIC, NONE, REPLICATE
Border Density	(2010,0100)	U	BLACK, WHITE
Max Density	(2010,0130)	U	0 < Value
Min Density	(2010,0120)	U	0 < Value < 50
Required if Presentation LUT is present			
Reflective Ambient Light	(2010,0160)	U	0 < Value
Illumination	(2010,015E)	U	0 < Value
Referenced Presentation LUT Sequence	(2050,0500)	U	

For Page Mode printing, the Image Display format used is Standard\1,1.

The N-CREATE-RSP message from the Print SCP includes the Referenced Image Box Sequence with SOP Class/Instance UID pairs which will be kept internally to be further used for the subsequent Basic Image Box SOP Class N-SET-RQ messages.

When all Image Boxes (including parameters) for the film-sheet have been set, the print manager will issue an N-ACTION-RQ message with the SOP Instance UID of the Basic Film Box and the Action Type ID of 1.

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Box.

The Basic Film Box SOP class interprets the status codes listed in the tables below:

Table 49: N-CREATE-RSP Status Handling Behavior for Basic Film Box

Service Status	Meaning	Error Codes	Behavior
Failure	There is an existing Film Box that has not been printed and N-ACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed	C616	Print job is marked as failed and the reason is logged
Warning	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead	B605	Print job continues and warning is logged
Success	Film Box successfully created	0000	Print job continues

Table 50: N-ACTION-RSP Status Handling Behavior for Basic Film Box

Service Status	Meaning	Error Codes	Behavior
Failure	Unable to create print job, print queue is full	C602	Print job is marked as failed and the reason is logged
	Image size is larger than images box size	C603	Print job is marked as failed and the reason is logged
	Combined Print Image size is larger than the Image Box size	C613	Print job is marked as failed and the reason is logged
Warning	Film box does not contain image box (empty page)	B603	Print job continues and warning is logged
	Image size is larger than image box size, the image has been demagnified	B604	Print job continues and warning is logged
	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	Print job continues and warning is logged
	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	Print job continues and warning is logged
Success	Film accepted for printing	0000	Print job continues

Basic Grayscale Image Box SOP Class

The Basic Grayscale Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Grayscale Image Box SOP Class uses only the N-SET-RQ with the attributes listed in the table below:

Table 51: Attributes for N-SET-RQ of Basic Grayscale Image Box

Attribute Name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
Basic Grayscale Image Sequence	(2020,0110)	M	
> Samples per Pixel	(0028,0002)	M	1
> Photometric Interpretation	(0028,0004)	M	MONOCHROME2
> Rows	(0028,0010)	M	
> Columns	(0028,0011)	M	
> Pixel Aspect Ratio	(0028,0034)	M	
> Bits Allocated	(0028,0100)	M	8,16
> Bits Stored	(0028,0101)	M	8,12
> High Bit	(0028,0102)	M	7,11
> Pixel Representation	(0028,0103)	M	0
> Pixel Data	(7FE0,0010)	M	

The Basic Grayscale Image Box SOP class interprets the status codes as listed below:

Table 52: N-SET-RSP Status Handling Behavior for the Basic Grayscale Image Box SOP Class

Service Status	Further Meaning	Error Codes	Behavior
Failure	Image contains more pixel than printer can print in Image Box	C603	Print job is marked as failed and the reason is logged
	Insufficient memory in printer to store the image	C605	Print job is marked as failed and the reason is logged
	Combined Print Image size is larger than the Image Box size	C613	Print job is marked as failed and the reason is logged
Warning	Image size is larger than image box size, the image has been demagnified.	B604	Print job continues and the reason is logged
	Requested MinDensity or MaxDensity outside of Printer's operating range	B605	Print job continues and the reason is logged
	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	Print job continues and warning is logged
	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	Print job continues and warning is logged
Success	Image successfully stored in Image Box	0000	Print job continues

Basic Color Image Box SOP Class

The Basic Color Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Color Image Box SOP Class uses only the N-SET-RQ with the attributes listed below:

Table 53: Attributes for N-SET-RQ of Basic Color Image Box

Attribute Name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
BASIC Color Image Sequence	(2020,0111)	M	
> Samples per Pixel	(0028,0002)	M	3
> Photometric Interpretation	(0028,0004)	M	RGB
> Planar Configuration	(0028,0006)	M	0
> Rows	(0028,0010)	M	
> Columns	(0028,0011)	M	
> Pixel Aspect Ratio	(0028,0034)	M	
> Bits Allocated	(0028,0100)	M	8
> Bits Stored	(0028,0101)	M	8
> High Bit	(0028,0102)	M	7
> Pixel Representation	(0028,0103)	M	0
> Pixel Data	(7FE0,0010)	M	

The Color Image Box SOP class interprets the status codes listed below:

Table 54: N-SET-RSP Status Handling Behavior for the Color Grayscale Image Box

Service Status	Meaning	Error Codes	Behavior
Failure	Image contains more pixel than printer can print in Image Box	C603	Print job is marked as failed and the reason is logged
	Insufficient memory in printer to store the image	C605	Print job is marked as failed and the reason is logged
	Combined Print Image size is larger than the Image Box size	C613	Print job is marked as failed and the reason is logged
Warning	Image size larger than image box size	B604	Print job continues and the reason is logged
	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	Print job continues and warning is logged
	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	Print job continues and warning is logged
Success	Image successfully stored in Image Box	0000	Print job continues

Presentation LUT SOP Class

The objective of the Presentation LUT is to realize image hardcopy printing tailored for specific modalities, applications and user preferences.

The output of the Presentation LUT is Presentation Values (P-Values). P-Values are approximately related to human perceptual response. They are intended to facilitate common input for hardcopy. P-Values are intended to be independent of the specific class or characteristics of the hardcopy device.

The **SPECTsyngo** Print Management SCU supports the following DIMSE Service elements for the Basic Film Session SOP Class as SCU:

- N-CREATE
- N-DELETE

The Presentation LUT SOP Class uses only the N-CREATE-RQ with the attributes listed below:

Table 55: Attributes for N-CREATE-RQ of Presentation LUT SOP Class

Attribute Name	Tag	Usage SCU	Supported Values
Presentation LUT Shape	(2050,0020)	U	IDENTITY

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and is used for later requests on the Basic Film Box (N-CREATE-RQ) and on the Presentation LUT (N-DELETE-RQ).

The Presentation LUT SOP class interprets the status codes listed below:

Table 56: N-CREATE-RSP Status Handling Behavior for the Presentation LUT SOP Class

Service Status	Further Meaning	Error Codes	Behavior
Warning	Requested MinDensity or MaxDensity outside of HCD's operating range. HCD will use its respective minimum or maximum density value instead.	B605	Print job continues and the reason is logged
Success	Presentation LUT successfully created	0000	Print job continues

Printer SOP Class

The Printer SOP Class provides the possibility to monitor the status of the hardcopy printer in a synchronous and in an asynchronous way.

When used synchronously the **SPECTsyngo** Print SCU uses the N-GET-RQ to request information about the printer status. It uses the attributes listed in the table below.

Table 57: Attributes for N-GET-RQ of the Printer SOP Class

Attribute Name	Tag	Usage SCP	Supported Values
Printer Status	(2110,0010)	M	NORMAL, FAILURE, WARNING
Printer Status Info	(2110,0020)	M	See table in chapter 0 for possible values.

The command communication failure behavior listed below applies to all SOP classes used for the "Print Film" activity:

Table 58: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user (Timeout configurable; default 30s)
Association Aborted	Failure reported to user

4.2.7.4 Association Acceptance Policy

4.2.7.4.1 Activity Print Film

4.2.7.4.1.1 Description and Sequencing of Activities

The **SPECTsyngo** supports the reverse role negotiation of the Printer SOP Class. Receiving the N-EVENT-REPORT-RQ from a printer the **SPECTsyngo** is asynchronously informed about changes of the printer status.

4.2.7.4.1.2 Accepted Presentation Context

The **SPECTsyngo** accepts Presentation Contexts as shown in the following table:

Table 59: Presentation Contexts for the Activity “Print Film”

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.4.1.3 SOP Specific Conformance

The arguments of the N-EVENT-REPORT-RQ are defined in the table below:

Table 60: Attributes for the N-EVENT-REPORT-RQ of the Printer SOP Class

Event-type Name	Event	Attributes	Tag	Usage SCU
Normal	1	-	-	-
Warning	2	Printer Status Info	(2110,0020)	U
Failure	3	Printer Status Info	(2110,0020)	U

4.2.7.4.2 Activity Print Management

4.2.7.4.2.1 Description and Sequencing of Activities

The **SPECTsyngo** supports the reverse role negotiation of the Print Job SOP Class. Receiving the N-EVENT-REPORT-RQ from a printer the **SPECTsyngo** is asynchronously informed about the status of a print job for monitoring its progress.

4.2.7.4.2.2 Accepted Presentation Context

The **SPECTsyngo** accepts Presentation Contexts as shown in the following table:

Table 61: Presentation Contexts for the Activity “Print Management”

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.4.2.3 SOP Specific Conformance

Attributes that can be handled by the Print AE of the product are listed in the table below.

Table 62: Attributes for the N-EVENT-REPORT-RQ of the Print Job SOP Class

Event-type Name	Event	Attributes	Tag	Usage SCU
Pending	1	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Printing	2	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Done	3	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Failure	4	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U

4.3 Network Interfaces

4.3.1 Physical Network Interface

The **SPECTsyngo** provides DICOM 3.0 TCP/IP network communication support as defined in Part 8 of the DICOM Standard. The network communication is independent from the physical medium over which TCP/IP executes; it inherits this from the Windows OS system upon which it executes.

4.3.2 Additional Protocols

none

4.3.3 IPv4 and IPv6 Support

IPv4 and IPv6 are supported. Regarding IPv6 please note, that the complete networking infrastructure in the hospital (firewalls, DNS-Servers, ...) must support IPv6 to get a functioning communication.

4.4 Configuration

4.4.1 AE Title/Presentation Address Mapping

AE Titles shall be unique within the hospital. A common way to achieve that is to use the hostname as part of the AE Titles. The string can be up to 16 characters and must not contain any extended characters. Only 7-bit ASCII characters (excluding Control Characters) are allowed according to the DICOM 2016a Standard.

4.4.1.1 Local AE Titles

The **SPECTsyngo** allows to configure AETitles, Ports and Services in any wished way. Default delivery is that all services are using the same AE title and only one port number. In case the connected systems cannot handle this default, the customer service engineer is able to configure for each service its own AE title and Port number.

Parameter	Configurable	Default Value
Default AE title	Yes	hostname in uppercase characters; limited to 16 characters
Default Basic Port	Yes	104
Default Secure Port	Yes	2762

4.4.1.2 Remote AE Title/Presentation Address Mapping

4.4.1.2.1 Remote Association Initiators

All relevant remote applications that may setup DICOM associations towards **SPECTsyngo** need to be configured in **SPECTsyngo**, before the association can be established. This behavior is configurable, but it is recommended, not to change this behavior.

The mapping of external AE Titles to TCP/IP addresses and ports is configurable and initially set at the time of installation by Installation Personnel. Changes later on can also be performed by the local system administrator. The Application Entity Titles and supported transfer syntaxes need to be known for configuration.

To enable a fast and efficient configuration possibility Siemens will deliver templates for known configuration examples, so that the behavior (usage of one AE title, default port numbers, supported services) is determined already through the template.

Remote Application Entities can be configured without restarting the process.

4.4.1.2.2 Remote Association Acceptors

For remote applications that shall be able to accept DICOM associations from **SPECTsyngo**, the following information needs to be available:

- Application Entity Title
- Host Name / IP address on which the remote application service runs
- Port number on which the remote application accepts association requests.

The remote system will be indicated in the UI of **SPECTsyngo** with a logical name, that is also entered when configuring the node in the administration UI.

To enable a fast and efficient configuration possibility Siemens will deliver templates for known configuration examples, so that the behavior (usage of one AE title, default port numbers, supported services) is determined already through the template.

Remote Application Entities can be configured without restarting the process.

4.4.1.3 Secure DICOM Communication

The system supports configuring the DICOM communication to use secure channel (TLS) between **SPECTsyngo** and configured remote nodes. As a security measure the certificate thumbprint or certificate trust chain of the remote nodes shall be added (pinned) to the **SPECTsyngo** system to authorize the incoming connection.

Detailed instructions how to set up secure DICOM communication are available in the Administrator Online Help.

Note: The default DICOM port will change to 2762.

If the certificate of remote node contains Enhanced Key Usage (Extended Key Usage) field, then:

- If the remote node acts as DICOM SCP it shall contain Server Authentication (1.3.6.1.5.5.7.3.1)
- If the remote node acts as a DICOM SCU it shall contain Client Authentication (1.3.6.1.5.5.7.3.2)

Otherwise **SPECTsyngo** will not accept the certificate.

4.4.2 Parameters

The next table lists configuration parameters, which are true for all Application Entities.

Table 63: Parameter List

Parameter	Configurable	Default Value
PDU size	Yes	32768 Bytes
time-out for accepting/rejecting an association request	Yes	30 s
time-out for responding to an association open/close request	Yes	30 s
time-out for accepting a message over network	Yes	30 s
time-out for waiting for data between TCP/IP-packets	Yes	5 s
time-outs for waiting for a Service Request/Response message from the remote node (Storage SCP/SCU)	Yes	30 s
time-outs for waiting for a Service Request/Response message from the remote node (Query/Retrieve SCP/SCU)	Yes	30 s
time-out for waiting for a C-MOVE-RSP	No	1200 s
number of image collection before saving to database	Yes	20
max matches query limit	Yes	100
max number of parallel receiving associations	Yes	12

5 Media Interchange

5.1 Implementation Model

5.1.1 Application Data Flow Diagram

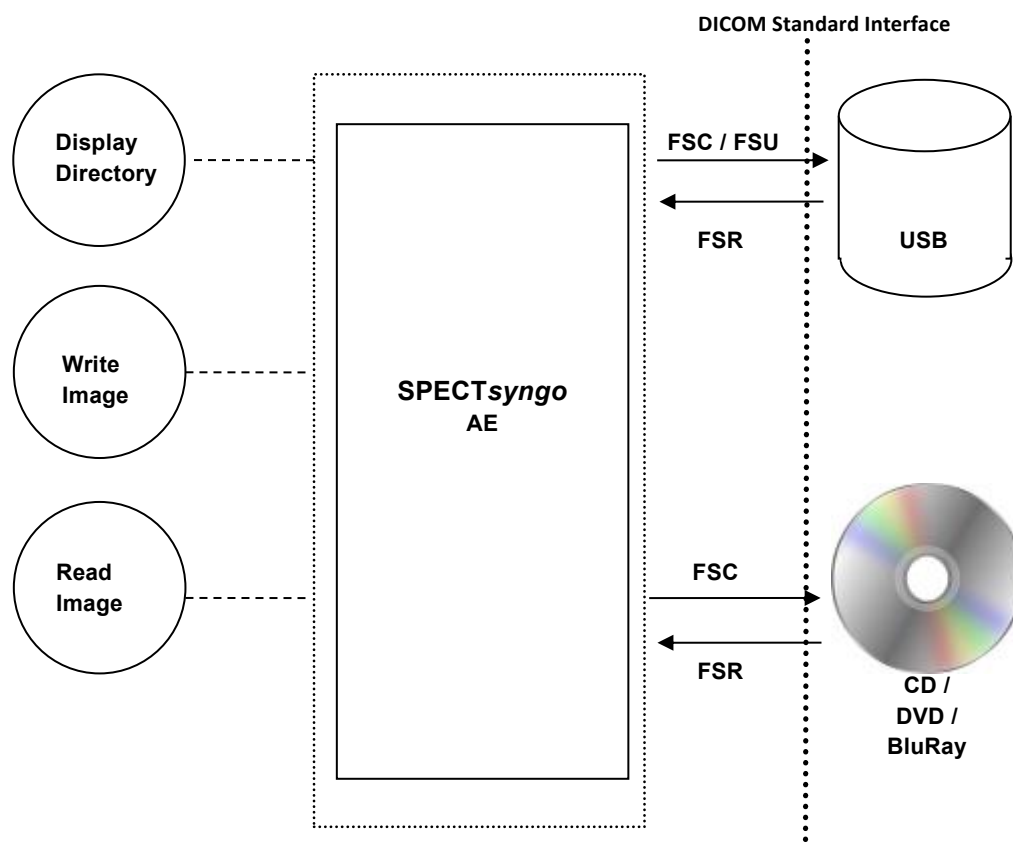


Figure 6: Media Interchange Application Data Flow Diagram

The **SPECTsyngo** provides the functionality to Import or Export DICOM Instances from and to the File System. During export, a DicomDIR may also be generated (user selection). A complete ISO Image ready-to-burn can also be generated. All SOP Classes defined in Table 1 are supported for the Import/Export functionality.

5.1.2 Functional definitions of AEs

The **SPECTsyngo** application is capable of

- creating a new File-set in the File System (Export to ...)
- importing SOP Instances from the medium onto local storage
- writing the File-sets DICOMDIR information into the file system and joining it to an ISO image.

5.1.3 Sequencing of Real-World Activities

Whenever data is written to an external media, **SPECTsyngo** creates a DICOMDIR from the selected data and creates an ISO image of the selected data on the local hard disk. Depending on the selected data and options (selected media size, with or without compression) either General Purpose CD profile, DVD-J2K, BD-J2K profile is used.

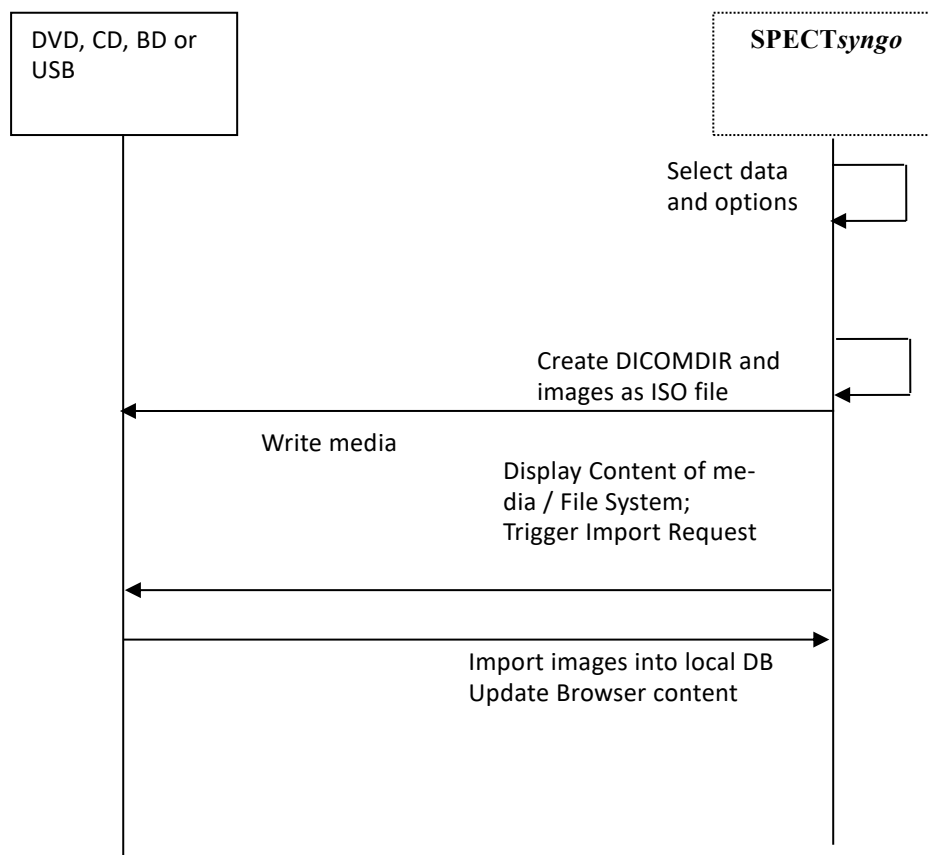


Figure 7: Sequence diagram – Media creation

5.1.4 File Meta Information for Implementation Class and Version

This section describes the values assigned to the File Meta Information attributes (see part PS 3.10) that pertain to the Implementation Class and Version. The implementation Class UID and the Implementation Version name in the File Meta Header are the same as the values specified for networking.

Table 64: Implementation Class/Version Name - Media Interchange

File Meta Information Version	0001
Implementation Class UID	1.3.12.2.1107.5.1.7
Implementation Version Name	SIEMENS_S10VA40A or SPECTSYNGO_VA20A (NM or PET)

5.2 AE SPECIFICATIONS

5.2.1 Media Storage AE – Specification

The **SPECTsyngo** provides conformance to the following Application Profiles as an FSC as well as an FSR. The FSU role is only supported on a non-optical storage device (e.g. USB stick).

In addition, augmented conformance is provided to store extra data objects important for the full feature support of the *syngo*®-based products. Details are listed below:

Table 65: Media - Application Profiles and Real-World Activities

Application Profiles Supported	Real-World Activity	Role	Service Class Option
AUG-GEN-CD	Browse Directory Information Import into Application Export to local Archive Media	FSR, FSC	Interchange
AUG-GEN-DVD			
AUG- GEN-DVD-J2K			
AUG-GEN-BD			
AUG-GEN-BD-J2K			
AUG- GEN-USB-J2K		FSR, FSC , FSU	
STD-GEN-CD	Browse Directory Information Import into Application Export to local Archive Media	FSR, FSC	Interchange
STD-GEN-DVD			
STD-GEN-DVD-J2K			
STD-GEN-BD			
STD-GEN-BD-J2K			
STD-GEN-USB-J2K		FSR, FSC , FSU	

5.2.1.1 Real-World Activities

5.2.1.1.1 Activity “Browse Directory Information”

The **SPECTsyngo** acts as FSR using the interchange option when requested to read the media directory.

The **SPECTsyngo** will read the DICOMDIR and insert those directory entries that are valid for the application profiles supported, into a local database. The database then is used for browsing media contents.

Note: The “Icon Image Sequence” is also supported in DICOMDIR. But only those Icon Images with “Bits Allocated” (0028,0100) equal to 8 and size of 64x64 or 128x128 pixels are imported into database and are visible in the Browser.

5.2.1.1.2 Real World Activity “Import into Application”

The **SPECTsyngo** application acts as FSR using the interchange option when requested to read SOP Instances from the medium into the application.

The SOP Instance selected from the media directory will be copied into the running Application. Only SOP Instances, that are valid for the application profile supported and supported by can be retrieved from media.

5.2.1.1.3 Real-World Activity “Export to local Archive Media”

The **SPECTsyngo** application acts as FSU (for media with existing DICOM file-set) or FSC (media not initialized) using the interchange option when requested to copy SOP Instances from the local storage to local Archive Medium. The activity as FSU is only possible as long as the local burning SW of **SPECTsyngo** has not already processed the generated ISO file.

The **SPECTsyngo** application will receive a list of SOP Instances to be copied to the local archive medium. Depending on the profile selected (Standard: uncompressed, with DICOMDIR; Patient: compressed with DICOMDIR) the SOP Instances will be taken, and an ISO file is being generated that includes the DICOMDIR and the corresponding objects.

It is then up to **SPECTsyngo** local configuration (if equipped with a local media burner) to burn the ISO file to the appropriate media.

5.2.1.2 SOP Classes and Transfer Syntaxes

These Application Profiles are based on the Media Storage Service Class with the Interchange Option. The **SPECTsyngo** provides Standard Conformance to the the SOP Classes listed in “Table 1: Network Services” section “SOP Classes Created by the **SPECTsyngo**” and “SOP Classes Managed by the **SPECTsyngo**” in the “[Conformance Statement Overview](#)”.

Using the Application Profiles supporting compression (AUG- GEN-DVD-J2K, AUG-GEN-BD-J2K, AUG- GEN-USB-J2K, STD-GEN-DVD-J2K, STD-GEN-USB-J2K, STD-GEN-BD-J2K) the following Transfer Syntaxes are supported:

Table 66: Transfer Syntaxes for STD-GEN-DVD-J2K, STD-GEN-BD-J2K and STD-GEN-USB-J2K

UID value	Transfer Syntax	Image Objects	Non-Image Objects
1.2.840.10008.1.2.1	Explicit Value Representation Little Endian native	yes	yes
1.2.840.10008.1.2.4.50	JPEG Baseline (Process 1) lossy compressed	yes	no
1.2.840.10008.1.2.4.51	JPEG Extended (Process 2 & 4) lossy compressed	yes	no
1.2.840.10008.1.2.4.70	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14) lossless compressed	yes	no
1.2.840.10008.1.2.4.90	JPEG 2000 Image Compression (Lossless Only) compressed	yes	no
1.2.840.10008.1.2.4.91	JPEG 2000 Image Compression lossy compressed	yes	no
1.2.840.10008.1.2.5	RLE Lossless compressed	yes	no

Using the Application Profiles that do not support compression (AUG- GEN-DVD, AUG-GEN-BD, AUG- GEN-USB, STD-GEN-DVD, STD-GEN-BD, STD-GEN-USB) only Explicit Value Representation Little Endian (1.2.840.10008.1.2.1) is supported.

5.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

5.3.1 Augmented Application Profiles

The standard application profiles are augmented with private object Siemens CSA Non-Image.

Table 67: Private SOP Classes and Transfer Syntaxes for Augmented Media Profiles

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC	FSR
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M

The Siemens non-image is typically used for raw data and 3D private data.

5.4 MEDIA CONFIGURATION

N/A

6 Support of Extended Character Sets

The **SPECTsyngo** DICOM application supports the following character sets as defined in the four tables below:

Table 68: Single-Byte Character Sets without Code Extension

Character Set Description	Defined Term	ISO registration number	Character Set
Default repertoire	None	ISO_IR 6	ISO 646:
Latin alphabet No. 1	ISO_IR 100	ISO_IR 100	Supplementary set
		ISO_IR 6	ISO 646:
Latin alphabet No. 2	ISO_IR 101	ISO_IR 101	Supplementary set
		ISO_IR 6	ISO 646
Latin alphabet No. 3	ISO_IR 109	ISO_IR 109	Supplementary set
		ISO_IR 6	ISO 646
Latin alphabet No. 4	ISO_IR 110	ISO_IR 110	Supplementary set
		ISO_IR 6	ISO 646
Cyrillic	ISO_IR 144	ISO_IR 144	Supplementary set
		ISO_IR 6	ISO 646
Arabic	ISO_IR 127	ISO_IR 127	Supplementary set
		ISO_IR 6	ISO 646
Greek	ISO_IR 126	ISO_IR 126	Supplementary set
		ISO_IR 6	ISO 646
Hebrew	ISO_IR 138	ISO_IR 138	Supplementary set
		ISO_IR 6	ISO 646
Latin alphabet No. 5	ISO_IR 148	ISO_IR 148	Supplementary set
		ISO_IR 6	ISO 646
Japanese	ISO_IR 13	ISO_IR 13	JIS X 0201: Katakana
		ISO_IR 14	JIS X 0201: Romaji
Thai	ISO_IR166	ISO_IR166	TIS 620-253 (1990)
		ISO_IR 6	ISO 646

Table 69: Single-Byte Characters Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	ISO registration number	Character Set
Default repertoire	ISO 2022 IR 6	ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.1	ISO 2022 IR 100	ISO 2022	ESC 02/13 04/01	ISO-IR 100	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.2	ISO 2022 IR 101	ISO 2022	ESC 02/13 04/02	ISO-IR 101	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646

Latin alphabet No.3	ISO 2022 IR 109	ISO 2022	ESC 02/13 04/03	ISO-IR 109	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.4	ISO 2022 IR 110	ISO 2022	ESC 02/13 04/04	ISO-IR 110	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646

Multi-Byte Character Sets without Code Extension

Table 70: Multi-Byte Character Sets without Code Extension

Character Set Description	Defined Term	ISO registration number	Character Set
Unicode	ISO_IR 192	ISO 10646	Unicode in UTF-8
Chinese	GB18030	GB18030	GB 18030-2000 (China Association for Standardization)

Table 71: Multi-Byte Character Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	ISO registration number	Character Set
Japanese	ISO 2022 IR 159	ISO 2022	ESC 02/04 02/08 04/04	ISO-IR 159 ISO-IR 87	JIS X 0212: Supplementary Kanji set
Korean	ISO 2022 IR 149	ISO 2022	ESC 02/04 02/09 04/03	ISO-IR 149	KS X 1001: Hangul and Hanja

All Special Character Sets (SCS) listed above are supported for incoming Data. When creating new Instances, the system will use the default SCS (or SCS List) configured on the machine.

When there is a mismatch between the given character set in attribute (0008,0005) and the characters in an IOD received by the system, then the following measures are taken to make the characters DICOM conform:

- Convert each illegal character to '?'

There are three categories of character sets which have to be differentiated because of their different encoding formats:

- Conventional ISO character sets: ISO_IR 6, ISO 2022 IR 6, ISO_IR 100, etc.
→ encoded in ISO 2022
- ISO_IR 192 → encoded in UTF-8
- GB18030 → encoded in GB18030

It is not possible to recognize the following mismatches automatically on receiving or importing:

- An attribute value is encoded in ISO_IR 192 $\leftrightarrow$ (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in GB18030 $\leftrightarrow$ (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in ISO 2022 $\leftrightarrow$ (0008,0005) contains ISO_IR 192
- An attribute value is encoded in ISO 2022 $\leftrightarrow$ (0008,0005) contains GB18030

An IOD that contains one of the above mentioned inconsistencies is not DICOM conform. As these kinds of inconsistencies cannot be recognized by the system, the IOD will not be rejected but the character data might be corrupted.

The **SPECTsyngo** supports Kanji characters in the byte zones after 74 (79, 7A, 7B and 7C).

7 Attribute confidentiality profiles

7.1 De-identification

The **SPECTsyngo** application can de-identify attributes, when exporting to Media. Three different levels of de-identification are supported:

- Full de-identification
- Reduced de-identification
- Service de-identification

The user needs to select the appropriate de-identification level during export.

Handling of public attributes during de-identification:

- Attributes listed in Table 72: Application-Level Confidentiality Profile attributes (standard tags) will be de-identified as specified for the different levels. Attributes not listed in the table are not PII/PHI-relevant and will not be de-identified.

Handling of private attributes during de-identification:

- Full de-identification: in general, private attributes are not included in anonymized data, exceptions are listed in Table 73
- Reduced de-identification: private attributes are de-identified according to Table 73
- Service de-identification: in general, private attributes are included in anonymized data, exceptions are listed in Table 73

In the following table for attributes marked with:

- 'Yes' - data are de-identified
- 'No' - data are kept

Table 72: Application-Level Confidentiality Profile attributes (standard tags)

DICOM Tag	Attribute Name	Full	Reduced	Service
(0000,1000)	Affected SOP Instance UID	Yes	No	No
(0000,1001)	Requested SOP Instance UID	Yes	No	No
(0002,0003)	Media Storage SOP Instance UID	Yes	No	No
(0004,1511)	Referenced SOP Instance UID in File	Yes	No	No
(0008,0014)	Instance Creator UID	Yes	No	No
(0008,0015)	Instance Coercion DateTime	Yes	No	No
(0008,0018)	SOP Instance UID	Yes	No	No
(0008,0020)	Study Date	Yes	No	No
(0008,0021)	Series Date	Yes	No	No
(0008,0022)	Acquisition Date	Yes	No	No
(0008,0023)	Content Date	Yes	No	No
(0008,0024)	Overlay Date	Yes	No	No
(0008,0025)	Curve Date	Yes	No	No
(0008,002A)	Acquisition DateTime	Yes	No	No
(0008,0030)	Study Time	Yes	No	No
(0008,0031)	Series Time	Yes	No	No
(0008,0032)	Acquisition Time	Yes	No	No
(0008,0033)	Content Time	Yes	No	No
(0008,0034)	Overlay Time	Yes	No	No
(0008,0035)	Curve Time	Yes	No	No
(0008,0050)	Accession Number	Yes	Yes	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0008,0058)	Failed SOP Instance UID List	Yes	No	No
(0008,0080)	Institution Name	Yes	Yes	No
(0008,0081)	Institution Address	Yes	Yes	No
(0008,0082)	Institution Code Sequence	Yes	Yes	No
(0008,0090)	Referring Physician's Name	Yes	Yes	Yes
(0008,0092)	Referring Physician's Address	Yes	Yes	Yes
(0008,0094)	Referring Physician's Telephone Numbers	Yes	Yes	Yes
(0008,0096)	Referring Physician's Identification Sequence	Yes	Yes	No
(0008,010D)	Context Group Extension Creator UID	Yes	No	No
(0008,0201)	Timezone Offset From UTC	Yes	No	No
(0008,1010)	Station Name	Yes	Yes	Yes
(0008,1030)	Study Description	Yes	Yes	No
(0008,103E)	Series Description	Yes	Yes	No
(0008,1040)	Institutional Department Name	Yes	Yes	No
(0008,1048)	Physician(s) of Record	Yes	Yes	Yes
(0008,1049)	Physician(s) of Record Identification Sequence	Yes	Yes	No
(0008,1050)	Performing Physicians' Name	Yes	Yes	Yes
(0008,1052)	Performing Physicians' Identification Sequence	Yes	Yes	No
(0008,1060)	Name of Physician(s) Reading Study	Yes	Yes	Yes
(0008,1062)	Physician Reading Study Identification Sequence	Yes	Yes	No
(0008,1070)	Operators' Name	Yes	Yes	Yes
(0008,1072)	Operators' Identification Sequence	Yes	Yes	No
(0008,1080)	Admitting Diagnoses Description	Yes	Yes	No
(0008,1084)	Admitting Diagnoses Code Sequence	Yes	Yes	No
(0008,1110)	Referenced Study Sequence	Yes	No	No
(0008,1111)	Referenced Performed Procedure Step Sequence	Yes	No	No
(0008,1120)	Referenced Patient Sequence	Yes	Yes	No
(0008,1140)	Referenced Image Sequence	Yes	No	No
(0008,1155)	Referenced SOP Instance UID	Yes	No	No
(0008,1195)	Transaction UID	Yes	No	No
(0008,2111)	Derivation Description	Yes	No	No
(0008,2112)	Source Image Sequence	Yes	No	No
(0008,3010)	Irradiation Event UID	Yes	No	No
(0008,4000)	Identifying Comments	Yes	Yes	No
(0008,9123)	Creator Version UID	Yes	No	No
(0010,0010)	Patient's Name	Yes	Yes	Yes
(0010,0020)	Patient ID	Yes	Yes	Yes
(0010,0021)	Issuer of Patient ID	Yes	Yes	No
(0010,0030)	Patient's Birth Date	Yes	Yes	Yes
(0010,0032)	Patient's Birth Time	Yes	Yes	No
(0010,0040)	Patient's Sex	Yes	No	No
(0010,0050)	Patient's Insurance Plan Code Sequence	Yes	Yes	Yes
(0010,0101)	Patient's Primary Language Code Sequence	Yes	Yes	Yes
(0010,0102)	Patient's Primary Language Modifier Code Sequence	Yes	Yes	Yes
(0010,1000)	Other Patient IDs	Yes	Yes	Yes
(0010,1001)	Other Patient Names	Yes	Yes	Yes
(0010,1002)	Other Patient IDs Sequence	Yes	Yes	Yes
(0010,1005)	Patient's Birth Name	Yes	Yes	Yes
(0010,1010)	Patient's Age	Yes	No	No
(0010,1020)	Patient's Size	Yes	No	No
(0010,1030)	Patient's Weight	Yes	No	No
(0010,1040)	Patient Address	Yes	Yes	Yes
(0010,1050)	Insurance Plan Identification	Yes	Yes	No
(0010,1060)	Patient's Mother's Birth Name	Yes	Yes	Yes
(0010,1080)	Military Rank	Yes	Yes	No
(0010,1081)	Branch of Service	Yes	Yes	No
(0010,1090)	Medical Record Locator	Yes	Yes	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0010,1100)	Referenced Patient Photo Sequence	Yes	Yes	No
(0010,2000)	Medical Alerts	Yes	Yes	No
(0010,2110)	Allergies	Yes	Yes	No
(0010,2150)	Country of Residence	Yes	Yes	No
(0010,2152)	Region of Residence	Yes	Yes	No
(0010,2154)	Patient's Telephone Number	Yes	Yes	Yes
(0010,2160)	Ethnic Group	Yes	No	No
(0010,2180)	Occupation	Yes	Yes	No
(0010,21A0)	Smoking Status	Yes	No	No
(0010,21B0)	Additional Patient's History	Yes	Yes	Yes
(0010,21C0)	Pregnancy Status	Yes	No	No
(0010,21D0)	Last Menstrual Date	Yes	No	No
(0010,21F0)	Patient's Religious Preference	Yes	Yes	No
(0010,2203)	Patient Sex Neutered	Yes	No	No
(0010,2297)	Responsible Person	Yes	Yes	No
(0010,2299)	Responsible Organization	Yes	Yes	No
(0010,4000)	Patient Comments	Yes	Yes	Yes
(0018,0010)	Contrast Bolus Agent	Yes	Yes	No
(0018,1000)	Device Serial Number	Yes	Yes	No
(0018,1002)	Device UID	Yes	No	No
(0018,1004)	Plate ID	Yes	Yes	No
(0018,1005)	Generator ID	Yes	Yes	No
(0018,1007)	Cassette ID	Yes	Yes	No
(0018,1008)	Gantry ID	Yes	Yes	No
(0018,1030)	Protocol Name	Yes	Yes	No
(0018,1400)	Acquisition Device Processing Description	Yes	Yes	No
(0018,2042)	Target UID	Yes	No	No
(0018,4000)	Acquisition Comments	Yes	Yes	No
(0018,700A)	Detector ID	Yes	Yes	No
(0018,9424)	Acquisition Protocol Description	Yes	Yes	No
(0018,9516)	Start Acquisition DateTime	Yes	No	No
(0018,9517)	End Acquisition DateTime	Yes	No	No
(0018,A003)	Contribution Description	Yes	Yes	No
(0020,000D)	Study Instance UID	Yes	No	No
(0020,000E)	Series Instance UID	Yes	No	No
(0020,0010)	Study ID	Yes	Yes	No
(0020,0052)	Frame of Reference UID	Yes	No	No
(0020,0200)	Synchronization Frame of Reference UID	Yes	No	No
(0020,3401)	Modifying Device ID	Yes	Yes	No
(0020,3404)	Modifying Device Manufacturer	Yes	Yes	No
(0020,3406)	Modified Image Description	Yes	Yes	No
(0020,4000)	Image Comments	Yes	Yes	No
(0020,9158)	Frame Comments	Yes	Yes	No
(0020,9161)	Concatenation UID	Yes	No	No
(0020,9164)	Dimension Organization UID	Yes	No	No
(0028,1199)	Palette Color Lookup Table UID	Yes	No	No
(0028,1214)	Large Palette Color Lookup Table UID	Yes	No	No
(0028,4000)	Image Presentation Comments	Yes	Yes	No
(0032,0012)	Study ID Issuer	Yes	Yes	No
(0032,1020)	Scheduled Study Location	Yes	Yes	No
(0032,1021)	Scheduled Study Location AE Title	Yes	Yes	No
(0032,1030)	Reason for Study	Yes	Yes	No
(0032,1032)	Requesting Physician	Yes	Yes	No
(0032,1033)	Requesting Service	Yes	Yes	No
(0032,1060)	Requested Procedure Description	Yes	Yes	No
(0032,1070)	Requested Contrast Agent	Yes	Yes	No
(0032,4000)	Study Comments	Yes	Yes	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0038,0004)	Referenced Patient Alias Sequence	Yes	Yes	No
(0038,0010)	Admission ID	Yes	Yes	No
(0038,0011)	Issuer of Admission ID	Yes	Yes	No
(0038,001E)	Scheduled Patient Institution Residence	Yes	Yes	No
(0038,0020)	Admitting Date	Yes	No	No
(0038,0021)	Admitting Time	Yes	No	No
(0038,0040)	Discharge Diagnosis Description	Yes	Yes	No
(0038,0050)	Special Needs	Yes	Yes	No
(0038,0060)	Service Episode ID	Yes	Yes	No
(0038,0061)	Issuer of Service Episode ID	Yes	Yes	No
(0038,0062)	Service Episode Description	Yes	Yes	No
(0038,0300)	Current Patient Location	Yes	Yes	No
(0038,0400)	Patient's Institution Residence	Yes	Yes	No
(0038,0500)	Patient State	Yes	Yes	No
(0038,4000)	Visit Comments	Yes	Yes	No
(0040,0001)	Scheduled Station AE Title	Yes	Yes	No
(0040,0002)	Scheduled Procedure Step Start Date	Yes	No	No
(0040,0003)	Scheduled Procedure Step Start Time	Yes	No	No
(0040,0004)	Scheduled Procedure Step End Date	Yes	No	No
(0040,0005)	Scheduled Procedure Step End Time	Yes	No	No
(0040,0006)	Scheduled Performing Physician Name	Yes	Yes	No
(0040,0007)	Scheduled Procedure Step Description	Yes	Yes	No
(0040,0008)	Scheduled Performing Physician Identification Sequence	Yes	Yes	No
(0040,0010)	Scheduled Station Name	Yes	Yes	No
(0040,0011)	Scheduled Procedure Step Location	Yes	Yes	No
(0040,0012)	Pre-Medication	Yes	Yes	No
(0040,0241)	Performed Station AE Title	Yes	Yes	No
(0040,0242)	Performed Station Name	Yes	Yes	No
(0040,0243)	Performed Location	Yes	Yes	No
(0040,0244)	Performed Procedure Step Start Date	Yes	No	No
(0040,0245)	Performed Procedure Step Start Time	Yes	No	No
(0040,0250)	Performed Procedure Step End Date	Yes	No	No
(0040,0251)	Performed Procedure Step End Time	Yes	No	No
(0040,0253)	Performed Procedure Step ID	Yes	Yes	No
(0040,0254)	Performed Procedure Step Description	Yes	Yes	No
(0040,0275)	Request Attributes Sequence	Yes	Yes	No
(0040,0280)	Comments on Performed Procedure Step	Yes	Yes	No
(0040,0555)	Acquisition Context Sequence	Yes	Yes	No
(0040,1001)	Requested Procedure ID	Yes	Yes	No
(0040,1002)	Reason For The Request-ed Procedure	Yes	Yes	No
(0040,1004)	Patient Transport Arrangements	Yes	Yes	No
(0040,1005)	Requested Procedure Location	Yes	Yes	No
(0040,1010)	Names of Intended Recipient of Results	Yes	Yes	No
(0040,1011)	Intended Recipients of Results Identification Sequence	Yes	Yes	No
(0040,1101)	Person Identification Code Sequence	Yes	Yes	No
(0040,1102)	Person Address	Yes	Yes	No
(0040,1103)	Person Telephone Numbers	Yes	Yes	No
(0040,1400)	Requested Procedure Comments	Yes	Yes	No
(0040,2001)	Reason for Imaging Service Request	Yes	Yes	No
(0040,2008)	Order Entered By	Yes	Yes	No
(0040,2009)	Order Enterer Location	Yes	Yes	No
(0040,2010)	Order Callback Phone Number	Yes	Yes	No
(0040,2016)	Placer Order Number of Imaging Service Request	Yes	Yes	No
(0040,2017)	Filler Order Number of Imaging Service Request	Yes	Yes	No
(0040,2400)	Imaging Service Request Comments	Yes	Yes	No
(0040,3001)	Confidentiality Constraint on Patient Data Description	Yes	Yes	No
(0040,4005)	Scheduled Procedure Step Start DateTime	Yes	No	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0040,4010)	Scheduled Procedure Step Modification DateTime	Yes	No	No
(0040,4011)	Expected Completion Date Time	Yes	No	No
(0040,4023)	Referenced General Purpose Scheduled Procedure Step Transaction UID	Yes	No	No
(0040,4025)	Scheduled Station Name Code Sequence	Yes	Yes	No
(0040,4027)	Scheduled Station Geographic Location Code Sequence	Yes	Yes	No
(0040,4028)	Performed Station Name Code Sequence	Yes	Yes	No
(0040,4030)	Performed Station Geographic Location Code Sequence	Yes	Yes	No
(0040,4034)	Scheduled Human Performers Sequence	Yes	Yes	No
(0040,4035)	Actual Human Performers Sequence	Yes	Yes	No
(0040,4036)	Human Performers Organization	Yes	Yes	No
(0040,4037)	Human Performers Name	Yes	Yes	No
(0040,4050)	Performed Procedure Step Start DateTime	Yes	No	No
(0040,4051)	Performed Procedure Step End DateTime	Yes	No	No
(0040,4052)	Procedure Step Cancellation DateTime	Yes	No	No
(0040,A027)	Verifying Organization	Yes	Yes	No
(0040,A073)	Verifying Observer Sequence	Yes	Yes	No
(0040,A075)	Verifying Observer Name	Yes	Yes	No
(0040,A078)	Author Observer Sequence	Yes	Yes	No
(0040,A07A)	Participant Sequence	Yes	Yes	No
(0040,A07C)	Custodial Organization Sequence	Yes	Yes	No
(0040,A088)	Verifying Observer Identification Code Sequence	Yes	Yes	No
(0040,A123)	Person Name	Yes	Yes	No
(0040,A124)	UID	Yes	Yes	No
(0040,A171)	Observation UID	Yes	No	No
(0040,A172)	Referenced Observation UID (Trial)	Yes	No	No
(0040,A192)	Observation Date (Trial)	Yes	No	No
(0040,A193)	Observation Time (Trial)	Yes	No	No
(0040,A307)	Current Observer (Trial)	Yes	Yes	No
(0040,A352)	Verbal Source (Trial)	Yes	Yes	No
(0040,A353)	Address (Trial)	Yes	Yes	No
(0040,A354)	Telephone Number (Trial)	Yes	Yes	Yes
(0040,A358)	Verbal Source Identifier Code Sequence (Trial)	Yes	Yes	No
(0040,A402)	Observation Subject UID (Trial)	Yes	No	No
(0040,A730)	Content Sequence	Yes	Yes	No
(0040,DB0C)	Template Extension Organization UID	Yes	No	No
(0040,DB0D)	Template Extension Creator UID	Yes	No	No
(0070,0001)	Graphic Annotation Sequence	Yes	Yes	No
(0070,0084)	Content Creator's Name	Yes	Yes	No
(0070,0086)	Content Creator's Identification Code Sequence	Yes	Yes	No
(0070,031A)	Fiducial UID	Yes	No	No
(0088,0140)	Storage Media Fileset UID	Yes	No	No
(0088,0200)	Icon Image Sequence	Yes	Yes	No
(0088,0904)	Topic Title	Yes	Yes	No
(0088,0906)	Topic Subject	Yes	Yes	No
(0088,0910)	Topic Author	Yes	Yes	No
(0088,0912)	Topic Keywords	Yes	Yes	No
(0400,0100)	Digital Signature UID	Yes	Yes	No
(0400,0402)	Referenced Digital Signature Sequence	Yes	Yes	No
(0400,0403)	Referenced SOP Instance MAC Sequence	Yes	Yes	No
(0400,0404)	MAC	Yes	Yes	No
(0400,0550)	Modified Attributes Sequence	Yes	Yes	No
(0400,0561)	Original Attributes Sequence	Yes	Yes	Yes
(2030,0020)	Text String	Yes	Yes	No
(3006,0024)	Referenced Frame of Reference UID	Yes	No	No
(3006,00C2)	Related Frame of Reference UID	Yes	No	No
(3008,0105)	Source Serial Number	Yes	No	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(300A,0013)	Dose Reference UID	Yes	No	No
(300E,0008)	Reviewer Name	Yes	Yes	No
(4000,0010)	Arbitrary	Yes	Yes	No
(4000,4000)	Text Comments	Yes	Yes	No
(4008,0042)	Results ID Issuer	Yes	Yes	No
(4008,0102)	Interpretation Recorder	Yes	Yes	No
(4008,010A)	Interpretation Transcriber	Yes	Yes	No
(4008,010B)	Interpretation Text	Yes	Yes	No
(4008,010C)	Interpretation Author	Yes	Yes	No
(4008,0111)	Interpretation Approver Sequence	Yes	Yes	No
(4008,0114)	Physician Approving Interpretation	Yes	Yes	No
(4008,0115)	Interpretation Diagnosis Description	Yes	Yes	No
(4008,0118)	Results Distribution List Sequence	Yes	Yes	No
(4008,0119)	Distribution Name	Yes	Yes	No
(4008,011A)	Distribution Address	Yes	Yes	No
(4008,0202)	Interpretation ID Issuer	Yes	Yes	No
(4008,0300)	Impressions	Yes	Yes	No
(4008,4000)	Results Comments	Yes	Yes	No
(50xx,xxxx)	Curve Data	Yes	Yes	No
(60xx,0100)	Overlay Bits Allocated	Yes	Yes	No
(60xx,0102)	Overlay Bit Position	Yes	Yes	No
(60xx,3000)	Overlay Data	Yes	Yes	No
(60xx,4000)	Overlay Comments	Yes	Yes	No
(FFFA,FFFA)	Digital Signatures Sequence	Yes	Yes	Yes
(FFFC,FFFC)	Data Set Trailing Padding	Yes	Yes	Yes

Table 73: Application-Level Confidentiality Profile Attributes (private tags)

DICOM Tag	Attribute Name	Full	Reduced	Service
(0019,0005)	Multiphase UID	Yes	Yes	Yes
(0019, SIEMENS CT VA0 COAD, 90)	Osteo offset	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 92)	Osteo Regression Line Slope	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 93)	Osteo Regression Line Intercept	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 96)	Osteo Phantom Number	Yes	No	No
(0019, SIEMENS MED NM, 93)	Phase start time	Yes	No	No
(0019, SIEMENS MED NM, A1)	Number of Phases	Yes	No	No
(0019, SIEMENS MED NM, A5)	Number of repeats / phase	Yes	No	No
(0019, SIEMENS MED NM, A6)	Cycles Per Repeat	Yes	No	No
(0019, SIEMENS MED NM, A7)	Repeat Start time	Yes	No	No
(0019, SIEMENS MED NM, A8)	Repeat Stop time	Yes	No	No
(0019, SIEMENS MED NM, A9)	Effective Repeat Time	Yes	No	No
(0019, SIEMENS MED NM, AA)	Acquired Cycles Per Repeat	Yes	No	No
(0033, SIEMENS MED NM, 29)	Crystal Thickness	Yes	No	No
(0033, SIEMENS MED NM, 30)	Preset Name Used for Acquisition	Yes	No	No
(0033, SIEMENS MED NM, 38)	Pixel Scale factor	Yes	No	No
(0035, SIEMENS MED NM, 00)	Specialized TOMO Type	Yes	No	No
(0035, SIEMENS MED NM, 04)	Repeat Number	Yes	No	No
(0035, SIEMENS MED NM, 05)	Phase Number	Yes	No	No
(0041, SIEMENS MED NM, 01)	WholeBody Tomo Position Index	Yes	No	No
(0041, SIEMENS MED NM, 02)	WholeBody Tomo Number of Positions	Yes	No	No
(0041, SIEMENS MED NM, 10)	Effective Emission Energy	Yes	No	No
(0057, SIEMENS MED NM, 03)	NM Pixel Units	Yes	No	No
(0061, SIEMENS MED NM, 62)	Recon Output Type	Yes	No	No
(0061, SIEMENS MED NM, 70)	NM Reconstruction Algorithm	Yes	No	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0061, SIEMENS MED NM, 8D)	PET Data Flag	Yes	No	No
(0065, SIEMENS MED NM, 01)	Original Detector Index	Yes	No	No
(0065, SIEMENS MED NM, 02)	Siemens Planar Data Organization	Yes	No	No
(7FE3, SIEMENS MED NM, 14)	Minimum pixel value in frame	Yes	No	No
(7FE3, SIEMENS MED NM, 15)	Maximum pixel value in frame	Yes	No	No
(7FE3, SIEMENS MED NM, 29)	Number of Rwaves in a frame	Yes	No	No
(0021, SIEMENS MR SDS 01, 19)	MR Phoenix Protocol	Yes	No	No
(0029, SIEMENS CT EXAM IMAGE,49)	Metal Artifact Reduction Type	Yes	No	No
(0029, SIEMENS CSA ENVELOPE, 10)	Syngo Report Data	Yes	No	No
(0029, SIEMENS CSA ENVELOPE, 11)	Syngo Report Presentation	Yes	No	No
(0029, SIEMENS CSA HEADER, 08)	Modality Image Header Type	Yes	No	No
(0029, SIEMENS CSA HEADER, 09)	Modality Image Header Version	Yes	No	No
(0029, SIEMENS CSA HEADER, 10)	Modality Image Header Info	Yes	No	No
(0029, SIEMENS CSA HEADER, 18)	Modality Series Header Type	Yes	No	No
(0029, SIEMENS CSA HEADER, 19)	Modality Series Header Version	Yes	No	No
(0029, SIEMENS CSA HEADER, 20)	Modality Series Header Info	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 40)	Application Header Sequence	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 41)	Application Header Type	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 42)	Application Header ID	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 43)	Application Header Version	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 44)	Application Header Info	Yes	No	No
(0029, SIEMENS CT APPL DATASET, 00)	Dual Energy Algorithm Parameters	Yes	No	No
(0029, SIEMENS CT APPL ALG PARAMS, 20)	Perfusion Result Set Id	Yes	No	No
(0029, SIEMENS CSA REPORT, 08)	syngo Report Type	Yes	No	No
(0029, SIEMENS CSA REPORT, 09)	syngo Report Version	Yes	No	No
(0029, SIEMENS CSA REPORT, 15)	SR Variant	Yes	No	No
(0029, SIEMENS CSA REPORT, 17)	SC SOP Instance UID	Yes	Yes	Yes
(0043, GEMS_PARM_01, 1E)	GE Delta Start Time	Yes	No	No
(0049, SIEMENS CT SPP HEADER, 10)	Raw Data Container	Yes	No	No
(0067, SIEMENS MED MI, 02)	Scanner Console Generation	Yes	No	No
(0067, SIEMENS MED MI, 03)	Recon Parameters	Yes	No	No
(0067, SIEMENS MED MI, 05)	Device IVK	Yes	No	No
(0067, SIEMENS MED MI, 14)	Raw Data Description	Yes	No	No
(0067, SIEMENS MED MI, 16)	Raw Data Series Instance UIDs	Yes	Yes	Yes
(0067, SIEMENS MED MI, 17)	Raw Data Referenced Series Instance UIDs	Yes	Yes	Yes
(0071, SIEMENS MED PT, 22)	Decay Correction DateTime	Yes	No	No

7.2 De-identification for Raw Data

The application treats Raw Data, see 9.1.3, separately with regards to Media Export.

There is only one de-identification level available for Raw Data, which can be referred to as the Full de-identification level as described in chapter 7.1. The following differences apply:

- Private attributes remain enclosed
- Following public attributes are removed:
 - (0008,103E) Series Description
 - (0008,1090) Manufacturer's Model Name
 - (0018,1200) Date of Last Calibration
 - (0018,1201) Time of Last Calibration
- Following public attributes are anonymized with defined values
- (0010, 0010) Patient Name = Dummy Name
- (0010, 0030) Patient's Birth Date = DateTime.Now
- (0010,0020) PatientID = new ID
- (0010,0040) Patient's Sex = O
- (0020,000D) Study Instance UID = new ID
- (0020,000E) Series Instance UID = new ID

8 Security

8.1 Security Profiles

8.1.1 Time Synchronization Profiles

Time Synchronization Profiles: The **SPECTsyngo** acts as an NTP Client in the Maintain Time Transaction.

8.1.2 Basic TLS Secure Transport Connection Profile

Basic TLS Secure Transport Connection Profile supports TLS version 1.0, 1.1 and 1.2 protocols with the following features:

Supported TLS Feature	Mechanism
Entity Authentication	RSA based certificates
Exchange of Master Secrets	RSA
Data Integrity	SHA
Privacy	Triple DES EDE, CBC

The default secure DICOM port is 2762 (can be reconfigured).

8.2 Association Level Security

It is possible to configure whether the SCP will only answer to known AETs or to any AET.

8.3 Application-Level Security

- User must login with own password
- For configuration and Maintenance, Service Technician must login with a separate password.

9 Annexes

9.1 IOD Contents

This section specifies each IOD created by this application (excluding private IOD's). It specifies the attribute name, tag, VR, and value. The value specifies the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values are specified.

9.1.1 Abbreviations

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

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

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

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

Abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

9.1.2 CT Image Storage SOP Class

Table 74: IOD of created CT Image Storage SOP Class Instances

IE	Module	Reference	Usage
Patient	Patient	Table 75	ALWAYS

IE	Module	Reference	Usage
Study	General Study	Table 76	ALWAYS
	Patient Study	Table 77	CONDITIONAL
Series	General Series	Table 78	ALWAYS
Frame of Reference	Frame of Reference	Table 79	ALWAYS
Equipment	General Equipment	Table 80	ALWAYS
Image	General Image	Table 81	ALWAYS
	Image Plane	Table 83	ALWAYS
	Image Pixel	Table 82	ALWAYS
	Contrast/Bolus	Table 84	CONDITIONAL
	CT Image	Table 85	ALWAYS
	Overlay Plane	Table 86	CONDITIONAL
	VOI LUT	Table 87	ALWAYS
	SOP Common	Table 88	ALWAYS
	Multi-energy CT Image Module	Table 89	Conditional

9.1.2.1 Patient Module Attributes

Table 75: Patient Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN		ALWAYS	MWL, USER, AUTO
Patient ID	(0010,0020)	LO		ALWAYS	MWL, USER, AUTO
Patient's Birth Date	(0010,0030)	DA		ALWAYS	MWL, USER, AUTO
Patient's Sex	(0010,0040)	CS	M, F, O	ALWAYS	MWL, USER, AUTO
Patient's Birth Time	(0010,0032)	TM		ANAP	MWL, AUTO
Other Patient IDs	(0010,1000)	LO		ANAP	MWL, AUTO
Other Patient Names	(0010,1001)	PN		ANAP	MWL, AUTO
Ethnic Group	(0010,2160)	SH		ANAP	MWL, USER

9.1.2.2 General Study Module Attributes

Table 76: General Study Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL, AUTO
Study Date	(0008,0020)	DA		ALWAYS	AUTO
Study Time	(0008,0030)	TM		ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN		VNAP	MWL
Study ID	(0020,0010)	SH		ANAP	MWL
Accession Number	(0008,0050)	SH		VNAP	MWL
Study Description	(0008,1030)	LO		VNAP	MWL, AUTO
Procedure Code Sequence	(0008,1032)	SQ		ANAP	AUTO
>Code Value	(0008,0100)	SH		ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO		ALWAYS	AUTO

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
>Coding Scheme Designator	(0008,0102)	SH	99CT_VIA for d.via task flows	ALWAYS	AUTO
Referenced Study Sequence	(0008,1110)	SQ		ANAP	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ANAP	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ANAP	AUTO

9.1.2.3 Patient Study Module Attributes

Table 77: Patient Study Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	SOURCE
Admitting Diagnoses Description	(0008,1080)	LO		ANAP	MWL AUTO
Patient's Age	(0010,1010)	AS		ANAP	MWL, AUTO
Patient's Size	(0010,1020)	DS		ANAP	MWL, AUTO
Patient's Weight	(0010,1030)	DS		ANAP	MWL, AUTO
Medical Alerts	(0010,2000)	LO		ANAP	AUTO
Allergies	(0010,2110)	LO		ANAP	AUTO
Smoking Status	(0010,21A0)	CS		ANAP	AUTO
Additional Patient History	(0010,21B0)	LT		ANAP	AUTO
Pregnancy Status	(0010,21C0)	US		ANAP	AUTO
Last Menstrual Date	(0010,21D0)	DA		ANAP	AUTO
Occupation	(0010,2180)	SH		ANAP	MWL
Admission ID	(0038,0010)	LO		ANAP	MWL, AUTO

9.1.2.4 General Series Module Attributes

Table 78: General Series Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	CT	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS	e.g. 940 for Ranges, from Original for all other Derived Volume Data	ALWAYS	AUTO
Laterality	(0020,0060)	CS	only available if the body part examined is a paired structure	EMPTY	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0018,1030)	LO	e.g. "Radial Ranges", "Parallel Ranges", "Volume Ranges", "Curved Ranges" or from Original	ANAP	USER AUTO
Series Description	(0008,103E)	LO		ANAP	USER
Body Part Examined	(0018,0015)	CS		ALWAYS	AUTO
Patient Position	(0018,5100)	CS		ALWAYS	AUTO
Request Attributes Sequence	(0040,0275)	SQ		ALWAYS	AUTO
>Requested Procedure ID	(0040,1001)	SH		ALWAYS	MWL

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
>Requested Procedure Description	(0040,0009)	SH		ALWAYS	MWL
>Accession Number	(0008,0050)	SH		ALWAYS	MWL
>Study Instance UID	(0020,000D)	UI		ALWAYS	MWL
Performed Procedure Step ID	(0040,0253)	SH		ALWAYS	MWL
Performed Procedure Step Start Date	(0040,0244)	DA		ALWAYS	MWL
Performed Procedure Step Start Time	(0040,0245)	TM		ALWAYS	MWL
Performed Procedure Step Description	(0040,0254)	LO		ALWAYS	MWL
Performed Protocol Code Sequence	(0040,0260)	SQ		ANAP	AUTO
>Code Value	(0008,0100)	SH		ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO		ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH	99CT_VIA for d.via data roles	ALWAYS	AUTO

9.1.2.5 Frame of Reference Module Attributes

Table 79: Frame of Reference Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame of Reference UID	(0020,0052)	UI		ALWAYS	AUTO
Position Reference Indicator	(0020,1040)	LO		EMPTY	AUTO

9.1.2.6 General Equipment Module Attributes

Table 80: General Equipment Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	SIEMENS Healthineers	ALWAYS	FIXED
Institution Name	(0008,0080)	LO	from WS Configuration	ALWAYS	CONFIG
Institution Address	(0008,0081)	ST	from WS Configuration	ANAP	CONFIG
Station Name	(0008,1010)	SH	from WS Configuration	ALWAYS	CONFIG
Institutional Department Name	(0008,1040)	LO	from WS Configuration	ALWAYS	CONFIG
Manufacturer's Model Name	(0008,1090)	LO	Symbia Pro.specta Q3 Symbia Pro.specta X3 Symbia Pro.specta X7	ANAP	FIXED
Device Serial Number	(0018,1000)	LO		ALWAYS	FIXED
Software Versions	(0018,1020)	LO	SPECTsyngo VA20A	ALWAYS	FIXED
Gantry ID	(0018,1008)	LO		ALWAYS	FIXED
Spatial Resolution	(0018,1050)	DS		ALWAYS	FIXED

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Date of Last Calibration	(0018,1200)	DA		ANAP	AUTO
Time of Last Calibration	(0018,1201)	TM		ANAP	AUTO
Pixel Padding Value	(0028,0120)	US		EMPTY	AUTO
Private Creator	(0029,00xx)	LO	SIEMENS CT EXAM EQUIPMENT	ALWAYS	FIXED

9.1.2.7 General Image Module Attributes

Table 81: General Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	0 for reference image	ALWAYS	AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Acquisition Number	(0020,0012)	IS		ALWAYS	AUTO
Acquisition Date	(0008,0022)	DA		ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM		ALWAYS	AUTO
Acquisition DateTime	(0008,002A)	DT		ALWAYS	AUTO
Referenced Image Sequence	(0008,1140)	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	AUTO
Images in Acquisition	(0020,1002)	IS		ALWAYS	AUTO
Image Comments	(0020,4000)	LT	e.g."Automatic Result, ME_70keV,Score9999,HD FoV,Arti- ficial120, eDDensity" "60bpm, 75%, 400ms, TS" "Filter Sn" Note: Artificial120: The resulting image values are proportional to the at- tenuation coefficient for a defined 120 kVp-like spectrum. eDDensity: Image values are pro- portional to electron density. (Elec- tron density variant of DirectDen- sity)	ALWAYS	USER
Burned In Annotation	(0028,0301)	CS	NO	ALWAYS	FIXED
Lossy Image Compression	(0028,2110)	CS	00	ALWAYS	AUTO
Irradiation Event UID	(0008,3010)	UI		ALWAYS	COPY
Private Creator	(0029,00xx)	LO	SIEMENS CT EXAM IMAGE	ALWAYS	FIXED

9.1.2.8 Image Pixel Module Attributes

Table 82: Image Pixel Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Rows	(0028,0010)	US		ALWAYS	AUTO

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Columns	(0028,0011)	US		ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H	ALWAYS	FIXED
Pixel Data	(7FE0,0010)	OB		ALWAYS	AUTO
Smallest Image Pixel Value	(0028,0106)	US		ALWAYS	AUTO
Largest Image Pixel Value	(0028,0107)	US		ALWAYS	AUTO

9.1.2.9 Image Plane Module Attributes

Table 83: Image Plane Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Pixel Spacing	(0028,0030)	DS		ALWAYS	AUTO
Image Orientation (Patient)	(0020,0037)	DS		ALWAYS	AUTO
Image Position (Patient)	(0020,0032)	DS		ALWAYS	AUTO
Slice Thickness	(0018,0050)	DS		ALWAYS	AUTO
Slice Location	(0020,1041)	DS		ALWAYS	AUTO
Private Creator	(0029,00xx)	LO	SIEMENS CT EXAM IMAGE	ALWAYS	FIXED

9.1.2.10 Contrast/Bolus Module Attributes

Table 84: Contrast Bolus Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Contrast/Bolus Agent	(0018,0010)	LO	NOTE: The type of used Contrast medium, or UNDEFINED if no Contrast medium is specified	ALWAYS	AUTO
Contrast/Bolus Volume	(0018,1041)	DS		ALWAYS	AUTO
Contrast/Bolus Start Time	(0018,1042)	TM		ALWAYS	AUTO
Contrast/Bolus Stop Time	(0018,1043)	TM		ALWAYS	AUTO
Contrast/Bolus Total Dose	(0018,1044)	DS	NOTE: Total amount in [mL] of the undiluted contrast agent - EXCLUDING Saline	ALWAYS	AUTO
Contrast Flow Rate	(0018,1046)	DS	Note: Multiple entries are possible (e.g. in case of e.g. multiphase injection protocols), Unit: [mL/s]	ALWAYS	AUTO
Contrast Flow Duration	(0018,1047)	DS	Note: Multiple entries are possible (e.g. in case of e.g. multiphase injection protocols), Unit: [s]	ALWAYS	AUTO
Contrast/Bolus Ingredient	(0018,1048)	CS	IODINE	ALWAYS	FIXED
Contrast/Bolus Ingredient Concentration	(0018,1049)	DS	Note: [mg] of active ingredient per [mL] of (diluted) agent	ALWAYS	AUTO

9.1.2.11 CT Image Module Attributes

Table 85: CT Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS	See Image Type Values	ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US	1	ALWAYS	FIXED
Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	FIXED
Bits Allocated	(0028,0100)	US	16	ALWAYS	FIXED
Bits Stored	(0028,0101)	US	16	ALWAYS	FIXED
High Bit	(0028,0102)	US	15	ALWAYS	FIXED
Rescale Intercept	(0028,1052)	DS	-8192	ALWAYS	AUTO
Rescale Slope	(0028,1053)	DS	1	ALWAYS	AUTO
Rescale Type	(0028,1054)	LO		ALWAYS	AUTO
KVP	(0018,0060)	DS		ALWAYS	AUTO
Acquisition Number	(0020,0012)	IS		ALWAYS	AUTO
Scan Options	(0018,0022)	CS	contains cardiac or respiratory information, from Original if original is a CT image, not set in case original is an XR3D or Enhanced CT image	ANAP	AUTO
Data Collection Diameter	(0018,0090)	DS		ALWAYS	AUTO
Reconstruction Diameter	(0018,1100)	DS		ALWAYS	AUTO
Distance Source to Detector	(0018,1110)	DS		ALWAYS	AUTO
Distance Source to Patient	(0018,1111)	DS		ALWAYS	AUTO
Gantry/Detector Tilt	(0018,1120)	DS		ALWAYS	AUTO
Table Height	(0018,1130)	DS		ALWAYS	AUTO
Rotation Direction	(0018,1140)	CS		ANAP	AUTO
Exposure Time	(0018,1150)	IS		ALWAYS	AUTO
X-Ray Tube Current	(0018,1151)	IS		ALWAYS	AUTO
Exposure	(0018,1152)	IS	Product of X-Ray Tube Current and Exposure Time. Unit is [mAs].	ALWAYS	AUTO
Filter Type	(0018,1160)	SH	SN_DE, SN_DESF, AU_DESF, AUSN_DESF, SN_LD, W1, W12	ALWAYS	AUTO
Generator Power	(0018,1170)	IS		ALWAYS	AUTO
Focal Spot(s)	(0018,1190)	DS		ALWAYS	AUTO
Convolution Kernel	(0018,1210)	SH	e.g. "Sd, Sa" <i>Note: Sd for eDDensity, Sa for Artificial120</i> <i>Note:</i> Artificial120: The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-like spectrum. eDDensity: Image values are proportional to electron density. (Electron density variant of DirectDensity)	ALWAYS	AUTO
Single Collimation Width	(0018,9306)	FD		ALWAYS	AUTO
Total Collimation Width	(0018,9307)	FD		ALWAYS	AUTO

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Table Speed	(0018,9309)	FD		ANAP	AUTO
Table Feed per Rotation	(0018,9310)	FD		ANAP	AUTO
Spiral Pitch Factor	(0018,9311)	FD		ANAP	AUTO
Exposure Modulation Type	(0018,9323)	CS	OFF_OFF, OFF_OFF_MINDO, OFF_OFF_PULS, OFF_MAC, OFF_MAC_MINDO, OFF_MAC_PULS, OFF_ZEC, OFF_ZEC_MINDO, OFF_ZEC_PULS, SHAPE_OFF, SHAPE_OFF_MINDO, SHAPE_OFF_PULS, SHAPE_MAC, SHAPE_MAC_MINDO, SHAPE_MAC_PULS, SHAPE_ZEC, SHAPE_ZEC_MINDO, SHAPE_ZEC_PULS, SINOD_OFF, SINOD_OFF_MINDO, SINOD_OFF_PULS, SINOD_MAC, SINOD_MAC_MINDO, SINOD_MAC_PULS, SINOD_ZEC, SINOD_ZEC_MINDO, SINOD_ZEC_PULS, ELLIP_OFF, ELLIP_OFF_MINDO, ELLIP_OFF_PULS, ELLIP_MAC, ELLIP_MAC_MINDO, ELLIP_MAC_PULS, ELLIP_ZEC, ELLIP_ZEC_MINDO, ELLIP_ZEC_PULS, XCARE_OFF, XCARE_OFF_MINDO, XCARE_OFF_PULS, XCARE_MAC, XCARE_MAC_MINDO, XCARE_MAC_PULS, XCARE_ZEC,XCARE_ZEC_MINDO, XCARE_ZEC_PULS	ALWAYS	AUTO
CTDIvol	(0018,9345)	FD		ANAP	AUTO
Calcium Scoring Mass Factor Device Attribute	(0018,9352)	FL		ANAP	FIXED
Energy Weighting Factor	(0018,9353)	FL		ANAP	AUTO
CT Additional X-Ray Source Sequence	(0018,9360)	SQ	Not present if Multi-energy CT Acquisition (0018,9361) is YES (Supplement 188)	ANAP	AUTO
>Focal Spot(s)	(0018,1190)	DS		ANAP	AUTO
>Energy Weighting Factor	(0018,9353)	FL		ANAP	AUTO
Multi-energy CT Acquisition	(0018,9361)	CS	YES NO	ANAP	FIXED

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Private Creator	(0029,00xx)	LO	SIEMENS CT EXAM IMAGE	ALWAYS	FIXED

9.1.2.11.1 Image Type Values

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
 - ORIGINAL: Identifies an Original Image
 - DERIVED: Identifies a Derived Image
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
 - PRIMARY: Identifies a Primary Image
 - SECONDARY: Identifies a Secondary Image
- Value 3 identifies any Image IOD-specific specialization. The following terms are defined in addition to the DICOM standard definitions:
 - AXIAL: identifies a CT cross-sectional image
 - LOCALIZER: identifies a CT Localizer Image
 - OTHER: Converted non-Axial and non-Localizer CT images
Note: AXIAL in this context means any cross-sectional image, and includes transverse, coronal, sagittal and oblique images.
- Value 4 is implementation specific:
 - CT_SOM5 RTD: identifies a Real Time Display Image
 - CT_SOM5 MIP: identifies a Maximum Intensity Projection image created by a CT application of a non-fix-axial Spiral Range
 - CT_SOM5 MPR: identifies Multi Planar Reconstruction image created by a CT application of non-fix-axial Spiral range
 - CT_SOM5 MON: identifies an image of a Monitoring or Premonitoring range
 - CT_SOM5 SEQ: identifies an image of a Sequence range
 - CT_SOM10 DEMIX: identifies mixed reconstructions out of two energy spectra
 - CT_SOM10 DEMEP: identifies Monoenergetic reconstructions out of two energy spectra
 - CT_SOM10 DEVNC: identifies VNC or Iodine reconstructions out of two energy spectra
 - CT_SOM5 SPI: identifies an image of a fix-axial Spiral range
 - 4D SPI: identifies an image of a ZigZag range
 - CT_SOM5 TOP: identifies an image of a Topogram range
 - CT_SOM5 ROT: identifies an image of a ROT range
 - CT_SOM5 STA: identifies an image of a Static range
 - CSA BLACK IMAGE: identifies an SC Image with black pixels; only graphics information is of interest
 - CT_SOM PROT: identifies an SC Image with black pixels; only graphics information is of interest
 - FLU: identifies an image of a fluoroscopy range
 - CT_SOM_ECGDOC: identifies an ECG documentation image
 - MPR: identifies Multi Planar Reconstruction image
 - MIP: identifies Maximum Intensity Projection image
 - MINIP: identifies Minimum Intensity Projection
 - CT_SOM8 DESPR: identifies Stopping Power Ratio (SPR) images
 - SYNCT_HEAD: identifies Synthetic CT image (Head)
 - SYNCT_PELVIS: identifies Synthetic CT image (Pelvis)
- Value 5 is specific to the **SPECTsyngo** or **Somaris 10** products
 - STD: Standard image of corresponding Type as given in value 4.
 - OTOM: Osteo Scanned Tomogram
 - OTOP: Osteo Scanned Topogram
 - PMON: Premonitoring Scan
 - TESTBOLUS: Testbolus Scan
 - RECON REFERENCE: identifies an image containing overlay graphics indicating the location of recon slices.

- RANGE REFERENCE: identifies an image containing overlay graphics indicating the area of a scan range.
- ME<energy>KEV: Mono-Energetic Image
- VNC: Virtual Non-Contrast Image
- IOD: Iodine Enhancement Image
- IMD: Iodine Concentration Image
- MIX: mixed reconstructions out of two energy spectra
- L: Image out of low energy
- H: Image out of high energy
- PARALLEL: Range type for parallel ranges (for syngo application)
- RADIAL: Range type for radial ranges (for syngo application)
- CURVED: Range type for radial ranges (for syngo application)
- SPR: identifies Stopping Power Ratio (SPR) images
- Value 6 is specific to dual energy acquisitions. The following terms are defined:
 - DE_TB: split filter dual energy range.
 - DE_2SPI: dual spiral dual energy range.
 - SNRG: Single energy
- Value 7 is specific to reconstruction of dual energy acquisitions. The following terms are defined:
 - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction
 - MIP THIN: Maximum Intensity Projection image for mixed/Mono-energetic/VNC/Iodine reconstruction
 - CONVCT: Conventional CT image

9.1.2.11.2 Image Type Values for Multi-Energy (Supplement 188)

- Value 4 identifies a Multi-Energy CT Image and is added after Value 3 of a Singler-Energy CT Image. It is only present if Multi-energy CT Acquisition (0018,9361) has a value of YES (see also Value 4 of Single-Energy CT Images in 9.1.2.11.1)
 - VMI identifies a Virtual Monochromatic Image
 - MAT_SPECIFIC identifies a Material-Specific Image
 - MAT_REMOVED identifies a Material-Removed Image
 - THRESHOLD
 - ENERGY_PROP_WT
- Value 5 is implementation specific (see also Value 4 of Single-Energy CT Images in 9.1.2.11.1)
 - CT_SOM10 DET3D: Threshold image
 - CT_SOM10 DEVCR: Vascular Calcium Removal image
 - CT_SOM10 DEQUAD: Quadruple
- Value 6 is implementation specific
 - ME<energy>KEV: Mono-Energetic Image
 - T1
 - PMON: Premonitoring Scan
 - VNC: Virtual Non-Contrast Image
 - IOD: Iodine Enhancement Image
 - IMD: Iodine Concentration Image
 - VCR<energy>KEV
- Value 7
 - COUNT: Single Source Counting
 - COUNT_2SRC: Dual Source Counting
- Value 8
 - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction
 - CONVCT: Conventional CT image
 - SPP: Spectral Post-Processing data is included

9.1.2.11.3 Rescale Type

- HU used for Hounsfield Units
- Z_EFF used for Effective Atomic Number
- ED used for Electron Density
- EDW used for normalized Electron Density

9.1.2.11.4 Rescale Type Values for Multi-Energy (Supplement 188)

- MGML used for Material density
- HU_MOD used for Modified Hounsfield Unit

9.1.2.12 Overlay Plane Module Attributes

Table 86: Overlay Plane Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Overlay Rows	(60xx,0010)	US		ALWAYS	AUTO
Overlay Columns	(60xx,0011)	US		ALWAYS	AUTO
Overlay Type	(60xx,0040)	CS		ALWAYS	AUTO
Overlay Origin	(60xx,0050)	SS		ALWAYS	AUTO
Overlay Bits Allocated	(60xx,0100)	US	1	ALWAYS	FIXED
Overlay Bit Position	(60xx,0102)	US	0	ALWAYS	FIXED
Overlay Data	(60xx,3000)	OB		ALWAYS	AUTO
Number of Frames in Overlay	(60xx,0015)	IS	1	ALWAYS	FIXED
Overlay Description	(60xx,0022)	LO		ALWAYS	EMPTY
Overlay Subtype	(60xx,0045)	LO	AUTOMATED	ALWAYS	AUTO
ImageFrameOrigin	(60xx,0051)	US	1	ALWAYS	FIXED
Overlay Label	(60xx,1500)	LO		ALWAYS	EMPTY

CT Images with overlay graphics created by the system are implementing the "Multi-frame Overlay Module" in addition to the "Overlay Plane Module".

That means such images can contain the DICOM Tag (60xx,0015) "Number of Frames in Overlay" even they are no Multi-frame images. The value of the DICOM Tag is always "1".

9.1.2.13 VOI LUT Module Attributes

Table 87: VOI LUT Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	(0028,1050)	DS		ALWAYS	AUTO
Window Width	(0028,1051)	DS		ALWAYS	AUTO
Window Center & Width Explanation	(0028,1055)	LO		ALWAYS	AUTO
VOI LUT Sequence	(0028,3010)	SQ	from Original	ANAP	AUTO

9.1.2.14 SOP Common Module Attributes

Table 88: SOP Common Module

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.2	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	AUTO
Timezone Offset From UTC	(0008,0201)	SH		ALWAYS	AUTO

9.1.2.15 Multi-energy CT Image Module

The Multi-energy CT Image Module is only present if Multi-energy CT Acquisition (0018,9361) has a value of YES.

Table 89: Multi-energy CT Image Module

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
Multi-energy CT Acquisition Sequence	(0018,9362)	SQ		ALWAYS	AUTO
>Multi-energy Acquisition Description	(0018,937B)	UT	TWINBEAM DUAL SPIRAL COUNTING	ALWAYS	AUTO
>Multi-energy CT X-Ray Source Sequence	(0018,9365)	SQ		ALWAYS	AUTO
>>X-Ray Source Index	(0018,9366)	US		ALWAYS	AUTO
>>X-Ray Source ID	(0018,9367)	UC		ALWAYS	AUTO
>>Multi-energy Source Technique	(0018,9368)	CS	CONSTANT_SOURCE	ALWAYS	FIXED
>>Source Start DateTime	(0018,9369)	DT		ALWAYS	AUTO
>>Source End DateTime	(0018,936A)	DT		ALWAYS	AUTO
>>Generator Power	(0018,1170)	IS		ALWAYS	AUTO
>CT Exposure Sequence	(0018,9321)	SQ		ALWAYS	AUTO
>>Referenced X-Ray Source Index	(0018,9377)	US		ALWAYS	AUTO
>>Estimated Dose Saving	(0018,9324)	FD		ALWAYS	EMPTY
>>Exposure Time in ms	(0018,9328)	FD		ALWAYS	AUTO
>>X-Ray Tube Current in mA	(0018,9330)	FD		ALWAYS	AUTO
>>Exposure in mAs	(0018,9332)	FD		ALWAYS	AUTO
>>CTDIvol	(0018,9345)	FD		ALWAYS	AUTO
>> Exposure Modulation Type	(0018,9323)	CS	ELLIP_ZEC (longitudinal and angular modulation)	ALWAYS	AUTO
>> CTDI Phantom Type Code Sequence		SQ		ALWAYS	AUTO
>>> Coding Scheme Designator	(0008,0102)	SH		ALWAYS	AUTO
>>> Coding Scheme Version	(0008,0103)	SH		ALWAYS	AUTO

>>> Code Meaning	(0008,0104)	SH		ALWAYS	AUTO
>Multi-energy CT X-Ray Detector Sequence	(0018,936F)	SQ		ALWAYS	AUTO
>> X-Ray Detector Index	(0018,9370)	UC		ALWAYS	AUTO
>> X-Ray Detector ID	(0018,9371)	US		ALWAYS	AUTO
>> Multi-energy Detector Type	(0018,9372)	CS	INTEGRATING PHOTON_COUNTING	ALWAYS	AUTO
>> Nominal Max Energy	(0018,9374)	DS		ANAP	AUTO
>> Nominal Min Energy	(0018,9375)	DS		ANAP	AUTO
>Multi-energy CT Path Sequence	(0018,9379)	SQ		ALWAYS	AUTO
>> Multi-energy CT Path Index	(0018,937A)	US		ALWAYS	AUTO
>> Referenced X-Ray Source Index	(0018,9377)	US		ALWAYS	AUTO
>>Referenced X-Ray De- tector Index	(0018,9376)	US		ALWAYS	AUTO
>CT Acquisition Details Sequence	(0018,9304)	SQ		ALWAYS	AUTO
>> Referenced Path Index	(0018,9378)	US		ALWAYS	AUTO
>> Rotation Direction	(0018,1140)	CS		ALWAYS	AUTO
>> Revolution Time	(0018,9305)	FD		ALWAYS	AUTO
>> Single Collimation Width	(0018,9306)	FD		ALWAYS	AUTO
>> Total Collimation Width	(0018,9307)	FD		ALWAYS	AUTO
>> Table Height	(0018,1130)	DS		ALWAYS	AUTO
>> Gantry/Detector Tilt	(0018,1120)	DS		ALWAYS	AUTO
>> Data Collection Diameter	(0018,0090)	DS		ALWAYS	AUTO
> CT X-Ray Details Sequence	(0018,9325)	SQ		ALWAYS	AUTO
KVP	(0018,0060)	DS		ALWAYS	AUTO
>> Referenced Path Index	(0018,9378)	US		ALWAYS	AUTO
>> Filter Material	(0018,7050)	CS	ALUMINIUM MIXED	ALWAYS	AUTO
>>Focal Spot(s)	(0018,1190)	DS		ANAP	AUTO
>>Energy Weighting Factor	(0018,9353)	FL		ANAP	AUTO
> CT Geometry Sequence	(0018,9312)	SQ		ALWAYS	AUTO
>> Referenced Path Index	(0018,9378)	US		ALWAYS	AUTO
>> Distance Source to Detector	(0018,1110)	DS		ALWAYS	AUTO
>> Distance Source to Data Collection Center	(0018,9335)	FD		ALWAYS	AUTO
Multi-energy CT Processing Sequence	(0018,9363)	SQ		ANAP	AUTO
> Decomposition Method	(0018,937E)	CS	PROJECTION_BASED IMAGE_BASED	ALWAYS	AUTO

			HYBRID		
> Decomposition Description	(0018,937F)	UT	None Iodine/Water Calcium/Iodine	ALWAYS	AUTO
Multi-energy CT Characteristics Sequence	(0018,9364)	SQ		ANAP	AUTO
> Monoenergetic Energy Equivalent	(0018,937C)	FD		ALWAYS	AUTO
> Derivation Algorithm Sequence	(0022,1612)	SQ		ALWAYS	AUTO
>> Algorithm Family Code Sequence	(0066,002F)	SQ		ALWAYS	AUTO
>>Algorithm Name	(0066,0036)	LS	Monoenergetic Plus Virtual Unenhanced Vascular Calcium Removal	ALWAYS	AUTO
>>Algorithm Version	(0066,0031)	LS		ANAP	AUTO
>>Algorithm Source	(0024,0202)	LS	SIEMENS HEALTHINEERS	ALWAYS	FIXED
> Performed Processing Parameters Sequence	(0074,1212)	SQ		ALWAYS	AUTO
>> Value Type	(0040,A040)	CS		ALWAYS	AUTO
>> Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>> Coding Scheme Designator	(0008,0102)	SH	DCM	ALWAYS	FIXED
>>> Code Value	(0008,0100)	SH	123108	ALWAYS	FIXED
>>> Code Meaning	(0008,0104)		Multispectral Processing	ALWAYS	FIXED
>> Text Value	(0040,A160)	UT		ANAP	AUTO

9.1.3 Raw Data Storage SOP Class

Table 90: IOD of created Raw Data Storage SOP Class Instances

IE	Module	Reference	Usage
Patient	Patient	Table 75 or 9.1.7.1	ALWAYS
Study	General Study	Table 76 or 9.1.7.2	ALWAYS
	Patient Study	Table 77 or 9.1.7.3	CONDITIONAL
Series	General Series	Table 91	ALWAYS
Frame of Reference	Frame of Reference	Table 79 or 9.1.7.6	ALWAYS
Equipment	General Equipment	Table 80 or 9.1.7.7	ALWAYS
Raw Data	Acquisition Context	Table 92	ALWAYS
	Raw Data	Table 93	ALWAYS
	SOP Common	Table 94	ALWAYS

9.1.3.1 General Series Module Attributes

Table 91: General Series Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	CT or NM	ALWAYS	FIXED

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA	<yyyymmdd>	ALWAYS	AUTO
Series Time	(0008,0031)	TM	<hhmmss.ffffff>	ALWAYS	AUTO
Protocol Name	(0018,1030)	LO		ANAP	USER
Series Description	0008,103E	LO	Note: for NM only	ANAP	USER
Referenced Performed Procedure Step Sequence	0008,1111	SQ	Note: for NM only	ANAP	MWL
>Referenced SOP Class UID	0008,1150	UI	Note: for NM only	ANAP	MWL
>Referenced SOP Instance UID	0008,1155	UI	Note: for NM only	ANAP	MWL
Performed Procedure Step Start Date	0040,0244	DA	Note: for NM only	ANAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM	Note: for NM only	ANAP	AUTO
Performed Procedure Step ID	0040,0253	SH	Note: for NM only	ANAP	MWL
Performed Procedure Step Description	0040,0254	LO	Note: for NM only	ANAP	MWL
Request Attributes Sequence	0040,0275	SQ	Note: for NM only	ALWAYS	AUTO
>Accession Number	0008,0050	SH	Note: for NM only	ANAP	MWL, USER
>Study Instance UID	0020,000D	UI	Note: for NM only	ALWAYS	MWL, AUTO

9.1.3.2 Acquisition Context Module Attributes

Table 92: Acquisition Context Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Context Sequence	(0040,0555)	SQ		VNAP	AUTO
> Concept Name Code Sequence	0040,A043	SQ		ANAP	AUTO
>> [Code Sequence Macro]			9.1.7.24	ANAP	AUTO
> Concept Code Sequence	0040,A168	SQ		ANAP	AUTO
>> [Code Sequence Macro]			9.1.7.24	ANAP	AUTO
>Value Type	0040,A040	CS	CODE	ANAP	FIXED
Acquisition Context Description	0040,0556	ST		ANAP	AUTO

9.1.3.3 Raw Data Module Attributes

Table 93: Raw Data Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS		VNAP	AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Creator-Version UID	(0008,9123)	UI		ALWAYS	AUTO

9.1.3.4 SOP Common Module Attributes

Table 94: SOP Common Module

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.66	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	AUTO
Timezone Offset From UTC	(0008,0201)	SH		ALWAYS	AUTO
Instance Number	(0020,0013)	IS	Note: for NM only	ALWAYS	AUTO

9.1.4 Secondary Capture Storage SOP Class

Table 95: IOD of created Secondary Capture Storage SOP Class Instances

IE	Module	Reference	Usage
Patient	Patient	Table 75	ALWAYS
Study	General Study	Table 76	ALWAYS
	Patient Study	Table 77	CONDITIONAL
Series	General Series	Table 96	ALWAYS
Equipment	General Equipment	Table 98	CONDITIONAL
	SC Equipment	Table 102	ALWAYS
Image	General Image	Table 99	ALWAYS
	Image Pixel	Table 100	ALWAYS
	SC Image	Table 103	ALWAYS
	Overlay Plane	Table 104	CONDITIONAL
	SOP Common	Table 105	ALWAYS

9.1.4.1 General Series Module Attributes

Table 96: General Series Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	CT	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS	e.g. 940 for Ranges, 970 for all other Captured Projection objects (Captured Projection Image) 980 (Bookmarks)	ALWAYS	AUTO
Series Date	(0008,0021)	DA	<yyyymmdd>	ALWAYS	AUTO
Series Time	(0008,0031)	TM	<hhmmss.ffffff>	ALWAYS	AUTO
Protocol Name	(0018,1030)	LO	"Radial Ranges", "Parallel Ranges", "Volume Ranges", "Curved Ranges" or from Original, Bookmark	ANAP	USER AUTO
Series Description	(0008,103E)	LO	e.g. „eDDensity, Artificial120" <i>Note:</i>	ANAP	USER

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
			Artificial120: The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-like spectrum. eDDensity: Image values are proportional to electron density. (Electron density variant of DirectDensity)		
Request Attributes Sequence	(0040,0275)	SQ		ALWAYS	AUTO
>Scheduled Procedure Step Description	(0040,0007)	LO	from Original	ANAP	AUTO
>Scheduled Procedure Step ID	(0040,0009)	SH	from Original	ANAP	AUTO
>Requested Procedure ID	(0040,1001)	SH		ALWAYS	MWL
>Reason For The Requested Procedure	(0040,1002)	LO	from Original	ANAP	AUTO
>Accession Number	(0008,0050)	SH		ALWAYS	MWL
>Study Instance UID	(0020,000D)	UI		ALWAYS	AUTO
>Scheduled Procedure Step ID	(0040,0009)	SH		ALWAYS	MWL
Performed Procedure Step ID	(0040,0253)	SH		ALWAYS	MWL
Performed Procedure Step Start Date	(0040,0244)	DA		ALWAYS	MWL
Performed Procedure Step Start Time	(0040,0245)	TM		ALWAYS	MWL
Performed Procedure Step Description	(0040,0254)	LO		ALWAYS	MWL
Comments on the Performed Procedure Step	(0040,0280)	ST	from Original	ANAP	AUTO
Performing Physician's Name	(0008,1050)	PN		ALWAYS	MWL
Operators' Name	(0008,1070)	PN		ALWAYS	MWL
Related Series Sequence	(0008,1250)	SQ	from Original	ANAP	AUTO
>Study Instance UID	(0020,000D)	UI	from Original	ALWAYS	AUTO
>Series Instance UID	(0020,000E)	UI	from Original	ALWAYS	AUTO
>Purpose of Reference Code Sequence	(0040,A170)	SQ	<zero length>	EMPTY	AUTO
Body Part Examined	(0018,0015)	CS	from Original	ANAP	AUTO

9.1.4.2 General Reference Module Attributes

Table 97: General Reference Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Derivation Description	(0008,2111)	ST	from Original	ANAP	AUTO

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Source Image Sequence	(0008,2112)	SQ	if derived from single image	ANAP	AUTO

9.1.4.3 General Equipment Module Attributes

Table 98: General Equipment Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	OT or XA or CT (default = OT, can be configured) (Captured Projection Image) XA (Bookmarks)	ALWAYS	AUTO, CONFIG
Secondary Capture Device Manufacturer	(0018,1016)	LO	"Siemens"	ALWAYS	AUTO
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	LO	"syngo_Application_SW_SYS"	ALWAYS	AUTO
Secondary Capture Device Software Version	(0018,1019)	LO		ALWAYS	AUTO

9.1.4.4 General Image Module Attributes

Table 99: General Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	0 for Reference Image	ALWAYS	AUTO
Content Date	(0008,0023)	DA	<yyyymmdd>	ALWAYS	AUTO
Content Time	(0008,0033)	TM	<hhmmss.ffffff>	ALWAYS	AUTO
Image Type	(0008,0008)	CS	See Image Type Values	ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS	from original (derived from single image) or calculated or <zero length> (derived from multiple images).	ALWAYS	USER

9.1.4.4.1 Image Type Values of Captures Projection Images

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
 - DERIVED: Identifies a Derived Image
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
 - SECONDARY: Identifies a Secondary Image
- Value 3 identifies any Image IOD-specific specialization. The following terms are defined in addition to the DICOM standard definitions:
 - OTHER: Converted non-Axial and non-Localizer CT images
Note: AXIAL in this context means any cross-sectional image, and includes transverse, coronal, sagittal and oblique images.
- Value 4 is implementation specific:
 - IAE_PRJ
- Value 5 identifies the filter type

- MPR: identifies Multi Planar Reconstruction images
- MPR_CV: identifies Multi Planar Reconstruction (curved cut) images
- MIP: identifies Maximum Intensity Projection images
- MIP_CV: identifies Maximum Intensity Projection (curved cut) images
- MINIP: identifies Maximum Intensity Projection images
- OVERVIEW

9.1.4.4.2 Image Type Values of Bookmarks

- DERIVED\SECONDARY\OTHER\IAE_BOOKMARK

9.1.4.5 Image Pixel Module Attributes

Table 100: Image Pixel Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	1 (grayscale image) 3 (RGB images)	ALWAYS	FIXED
Photometric Interpretation	(0028,0004)	CS	MONOCHROME2 (grayscale image) RGB (RGB images)	ALWAYS	FIXED
Rows	(0028,0010)	US	512	ALWAYS	FIXED
Columns	(0028,0011)	US	512	ALWAYS	FIXED
Bits Allocated	(0028,0100)	US	16 (grayscale image) 8 (RGB images)	ALWAYS	FIXED
Bits Stored	(0028,0101)	US	12 (grayscale image) 8 (RGB images)	ALWAYS	FIXED
High Bit	(0028,0102)	US	11 (grayscale image) 7 (RGB images)	ALWAYS	FIXED
Pixel Representation	(0028,0103)	US	0000H	ALWAYS	FIXED
Pixel Data	(7FE0,0010)	OB		ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0	Only if Samples per pixel > 1	FIXED

9.1.4.6 Image Plane Module Attributes

Table 101: Image Plane Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Pixel Spacing	(0028,0030)	DS	If image has been calibrated	ANAP	AUTO

9.1.4.7 SC Equipment Module Attributes

Table 102: SC Equipment Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Conversion Type	(0008,0064)	CS	DF;WSD	ALWAYS	FIXED
Modality	(0008,0060)	CS	CT	ALWAYS	FIXED
Secondary Capture Device ID	(0018,1010)	LO		ALWAYS	AUTO

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Secondary Capture Device Manufacturer	(0018,1016)	LO	Siemens	ALWAYS	COPY
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	LO	see Manufacturers Model name	ALWAYS	COPY
Secondary Capture Device Software Versions	(0018,1019)	LO		ALWAYS	COPY

9.1.4.8 SC Image Module Attributes

Table 103: SC Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Date of Secondary Capture	(0018,1012)	DA	The date the Secondary Capture Image was captured. <yyyymmdd>	ALWAYS	AUTO
Time of Secondary Capture	(0018,1014)	TM	The time the Secondary Capture Image was captured.	ALWAYS	AUTO
Pixel Spacing Calibration Type	(0028,0A02)	CS	from Original	ANAP	AUTO
Pixel Spacing Calibration Description	(0028,0A04)	LO	from Original	ANAP	AUTO

9.1.4.9 Overlay Plane Module Attributes

Table 104: Overlay Plane Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Overlay Rows	(60xx,0010)	US	512	ALWAYS	FIXED
Overlay Columns	(60xx,0011)	US	512	ALWAYS	FIXED
Overlay Type	(60xx,0040)	CS	G	ALWAYS	FIXED
Overlay Origin	(60xx,0050)	SS	1,1	ALWAYS	FIXED
ImageFrameOrigin	(60xx,0051)	US	1	ALWAYS	FIXED
Overlay Bits Allocated	(60xx,0100)	US	1	ALWAYS	FIXED
Overlay Bit Position	(60xx,0102)	US	0	ALWAYS	FIXED
Overlay Data	(60xx,3000)	OB		ALWAYS	AUTO
Number of Frames in Overlay	(60xx,0015)	IS	1	ALWAYS	FIXED

Note: Secondary Captures with overlay graphics created by the system are implementing the "Multi-frame Overlay Module" in addition to the "Overlay Plane Module".

That means such images can contain the DICOM Tag (60xx,0015) "Number of Frames in Overlay" even they are no multi-frame images. The value of the DICOM Tag is always "1".

9.1.4.10 SOP Common Module Attributes

Table 105: SOP Common Module

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
Instance Creation Date	(0008,0012)	DA	<yyyymmdd>	ALWAYS	AUTO

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
Instance Creation Time	(0008,0013)	TM	<hhmmss.ffffff>	ALWAYS	AUTO
Instance Creator UID	(0008,0014)	UI	<implementation_class_uid>.<individual_id>	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	AUTO
Timezone Offset From UTC	(0008,0201)	SH		ALWAYS	AUTO

9.1.5 X-Ray Radiation Dose Report Storage SOP Class

Table 106: IOD of created X-Ray Radiation Dose Report Storage SOP Class Instances

IE	Module	Reference	Usage
Patient	Patient	Table 75	ALWAYS
Study	General Study	Table 76	ALWAYS
Series	SR Document Series	Table 107	ALWAYS
Equipment	General Equipment	Table 80	ALWAYS
	Enhanced General Equipment	Table 108	ALWAYS
Document	SR Document General	Table 109	ALWAYS
	SR Document Content	Table 110	ALWAYS
	SOP Common	Table 111	ALWAYS

9.1.5.1 SR Document Series Module Attributes

Table 107: SR Document Series Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	SR	ALWAYS	FIXED
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Series Description	(0008,103E)	LO		ALWAYS	AUTO

9.1.5.2 Enhanced General Equipment Module Attributes

Table 108: Enhanced General Equipment Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	SIEMENS Healthineers	ALWAYS	COPY
Manufacturer's Model Name	(0008,1090)	LO	SOMATOM go.Now, SOMATOM go.Up, SOMATOM go.All, SOMATOM go.Top,	ANAP	COPY

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
			SOMATOM go.Fit, SOMATOM go.Sim, SOMATOM go.Open Pro, SOMATOM X.cite, SOMATOM X.ceed, NAEOTOM Alpha		
Device Serial Number	(0018,1000)	LO		ALWAYS	COPY
Software Versions	(0018,1020)	LO	syngo CT VA40A	ALWAYS	COPY

9.1.5.3 SR Document General Module Attributes

Table 109: SR Document General Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	1	ALWAYS	FIXED
Completion Flag	(0040,A491)	CS	COMPLETE	ALWAYS	FIXED
Verification Flag	(0040,A493)	CS	UNVERIFIED	ALWAYS	FIXED
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO

9.1.5.4 SR Document Content Module Attributes

Table 110: SR Document Content Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Value Type	(0040,A040)	CD	CONTAINER	ALWAYS	FIXED
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)	SH	113701	ALWAYS	FIXED
>Coding Scheme Designator	(0008,0102)	SH	DCM	ALWAYS	FIXED
>Code Meaning	(0008,0104)	LO	X-Ray Radiation Dose Report	ALWAYS	FIXED
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	FIXED
Content Template Sequence	(0040,A504)	SQ		ALWAYS	AUTO
>Mapping Resource	(0008,0105)	CS	DCMR	ALWAYS	FIXED
>Template Identifier	(0040,DB00)	CS	10011	ALWAYS	FIXED
Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO

9.1.5.5 SOP Common Module Attributes

Table 111: SOP Common Module

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.88.67	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
Specific Character Set	(0008,0005)	CS		ALWAYS	AUTO

9.1.6 Examination Report Storage SOP Class

The Examination Report object is based on “1.2.840.10008.5.1.4.1.1.88.22 Enhanced SR Storage”

Table 112: IOD of created Examination Report Storage SOP Class Instances

IE	Module	Reference	Usage
Patient	Patient	Table 75	M
Study	General Study	Table 76	M
Series	SR Document Series	Table 107	M
Equipment	General Equipment	Table 80	M
Document	SR Document General	Table 109	M
	SR Document Content	Table 113	M
	SOP Common	Table 114	M

9.1.6.1 SR Document Content Module Attributes

Table 113: SR Document Content Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Value Type	(0040,A040)	CD	CONTAINER	ALWAYS	FIXED
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)	SH	1	ALWAYS	FIXED
>Coding Scheme Designator	(0008,0102)	SH	99CT_SOMX	ALWAYS	FIXED
>Code Meaning	(0008,0104)	LO	CT Examination Report	ALWAYS	FIXED
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	FIXED
Content Template Sequence	(0040,A504)	SQ		ALWAYS	AUTO
>Mapping Resource	(0008,0105)	CS	99CT_SOMX	ALWAYS	FIXED
>Template Identifier	(0040,DB00)	CS		ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO

9.1.6.2 SOP Common Module Attributes

Table 114: SOP Common Module

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.88.22	ALWAYS	FIXED
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		ALWAYS	AUTO

DICOM Attribute Name	Tag	Type	Value	Presence of Value	Source
Coding Scheme Identification Sequence	(0008,0110)	SQ		ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH	99CT_SOMX	ALWAYS	FIXED
>Coding Scheme Responsible Organization	(0008,0116)	ST	Siemens AG, Healthcare, HC IM CR	ALWAYS	FIXED
>Coding Scheme Name	(0008,0115)	ST	CT Structured Report Content for SPECTsyngo	ALWAYS	FIXED

9.1.7 NM Image Storage SOP Class

Table 115: IOD of NM Image Storage SOP Class Instances

IE	Module	Reference	Usage
Patient	Patient	9.1.7.1	ALWAYS
Study	General Study	9.1.7.2	ALWAYS
	Patient Study	9.1.7.3	ALWAYS
Series	General Series	9.1.7.4	ALWAYS
	NM/PET Patient Orientation	9.1.7.5	ALWAYS
Frame of Reference	Frame of Reference	9.1.7.6	ALWAYS
Equipment	General Equipment	9.1.7.7	ALWAYS
Image	General Image	9.1.7.8	ALWAYS
	Acquisition Context	9.1.7.9	CONDITIONAL
	Image Pixel	9.1.7.10	ALWAYS
	NM Image Pixel	9.1.7.11	ALWAYS
	Multi-frame	9.1.7.12	ALWAYS
	NM Multi-frame	9.1.7.13	ALWAYS
	NM Image	9.1.7.14	ALWAYS
	NM Isotope	9.1.7.15	ALWAYS
	NM Detector	9.1.7.16	ALWAYS
	NM TOMO Acquisition	9.1.7.17	CONDITIONAL
	NM Multi-gated Acquisition	9.1.7.18	CONDITIONAL
	NM Phase	9.1.7.19	CONDITIONAL
	NM Reconstruction	9.1.7.20	CONDITIONAL
	Curve	9.1.7.21	CONDITIONAL
	VOI LUT	9.1.7.22	ALWAYS
	SOP Common	9.1.7.23	ALWAYS

Note: SPECTsyngo supports the following retired Modules in Image IE: Curve.

9.1.7.1 Patient Module Attributes

Table 116: Patient Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER

Patient ID	0010,0020	LO		ALWAYS	MWL, USER
Issuer of Patient ID	0010,0021	LO		ANAP	MWL
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER
Patients Birth Time	0010,0032	TM		ANAP	MWL
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER
Other Patient IDs	0010,1000	LO		ANAP	MWL
Other Patient Names	0010,1001	PN		ANAP	MWL
Ethnic Group	0010,2160	SH		ANAP	MWL, USER

9.1.7.2 General Study Module Attributes

Table 117: General Study Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA		ALWAYS	AUTO
Study Time	0008,0030	TM		ALWAYS	AUTO
Accession Number	0008,0050	SH		VNAP	MWL, USER
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER
Study Description	0008,1030	LO		ALWAYS	MWL, USER
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL
> [Code Sequence Macro]				ANAP	MWL
Study Instance UID	0020,000D	UI		ALWAYS	MWL, AUTO
Study ID	0020,0010	SH		VNAP	MWL, USER
Requesting Physician	0032,1032	PN	See Note	VNAP	MWL

Note: SPECTsyngo extends the module to include this as Type 3 attribute.

9.1.7.3 Patient Study Module Attributes

Table 118: Patient Study Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Admitting Diagnoses Description	0008,1080	LO		ANAP	MWL, USER
Patient's Age	0010,1010	AS		ANAP	MWL, USER
Patient's Size	0010,1020	DS		ANAP	MWL, USER
Patient's Weight	0010,1030	DS		ALWAYS	MWL, USER
Occupation	0010,2180	SH		ANAP	MWL
Admission ID	0038,0010	LO		ANAP	MWL

9.1.7.4 General Series Module Attributes

Table 119: General Series Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA		ALWAYS	AUTO
Series Time	0008,0031	TM		ALWAYS	AUTO
Modality	0008,0060	CS	NM	ALWAYS	FIXED
Series Description	0008,103E	LO		ANAP	USER
Performing Physician's Name	0008,1050	PN		ALWAYS	MWL
Operators' Name	0008,1070	PN		ANAP	MWL, USER
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	MWL

>Referenced SOP Class UID	0008,1150	UI		ANAP	MWL
>Referenced SOP Instance UID	0008,1155	UI		ANAP	MWL
Related Series Sequence	0008,1250	SQ		ANAP	AUTO
>Study Instance UID	0020,000D	UI		ANAP	AUTO
>Series Instance UID	0020,000E	UI		ANAP	AUTO
>Purpose of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO
>> [Code Sequence Macro]				ANAP	AUTO
Body Part Examined	0018,0015	CS		ANAP	AUTO, USER
Protocol Name	0018,1030	LO		ANAP	USER
Patient Position	0018,5100	CS		ALWAYS	AUTO
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Series Number	0020,0011	IS		ALWAYS	AUTO
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO
Performed Procedure Step ID	0040,0253	SH		ANAP	MWL
Performed Procedure Step Description	0040,0254	LO		ANAP	MWL
Request Attributes Sequence	0040,0275	SQ		ALWAYS	AUTO
>Accession Number	0008,0050	SH		ALWAYS	MWL, USER
>Study Instance UID	0020,000D	UI		ALWAYS	MWL, AUTO
>Referenced Study Sequence	0008,1110	SQ		ALWAYS	MWL, AUTO
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL, AUTO
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL, AUTO
>Requested Procedure Description	0032,1060	LO		ALWAYS	MWL
>Requested Procedure Code Sequence	0032,1064	SQ		ANAP	MWL
>> [Code Sequence Macro]				ANAP	MWL
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	MWL
>Scheduled Protocol Code Sequence	0040,0008	SW		ANAP	MWL
>> [Code Sequence Macro]				ANAP	MWL
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL
>Requested Procedure ID	0040,1001	SH		ANAP	MWL
>Reason for The Requested Procedure	0040,1002	LO		ANAP	MWL

9.1.7.5 NM/PET Patient Orientation Module Attributes

Table 120: NM/PET Patient Orientation Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Orientation Code Sequence	0054,0410	SQ		ALWAYS	AUTO
> [Code Sequence Macro]				ANAP	AUTO
>Patient Orientation Modifier Code Sequence	0054,0412	SQ		ANAP	AUTO

>> [Code Sequence Macro]				ANAP	AUTO
>Patient Gantry Relationship Code Sequence	0054,0414	SQ		ALWAYS	AUTO
>> [Code Sequence Macro]				ANAP	AUTO

9.1.7.6 Frame of Reference Module Attributes

Table 121: Frame of Reference Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO
Position Reference Indicator	0020,1040	LO		EMPTY	AUTO

9.1.7.7 General Equipment Module Attributes

Table 122: General Equipment Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Siemens Healthineers	ALWAYS	FIXED
Institution Name	0008,0080	LO		ALWAYS	CONFIG
Institution Address	0008,0081	ST		ANAP	CONFIG, USER
Station Name	0008,1010	SH		ALWAYS	CONFIG
Institutional Department Name	0008,1040	LO		ALWAYS	CONFIG
Manufacturer's Model Name	0008,1090	LO	Symbia Pro.specta Q3 Symbia Pro.specta X3 Symbia Pro.specta X7	ALWAYS	FIXED
Device Serial Number	0018,1000	LO		ALWAYS	FIXED
Software Versions	0018,1020	LO	SPECTsyngo VA20A	ALWAYS	FIXED
Date of Last Calibration	0018,1200	DA		ALWAYS	AUTO
Time of Last Calibration	0018,1201	TM		ALWAYS	AUTO

9.1.7.8 General Image Module Attributes

Table 123: General Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	CS	Section 9.1.7.8.1	ALWAYS	AUTO
Acquisition Date	0008,0022	DA		ALWAYS	AUTO
Content Date	0008,0023	DA		ALWAYS	AUTO
Acquisition Datetime	0008,002A	DA		ALWAYS	AUTO
Acquisition Time	0008,0032	TM		ALWAYS	AUTO
Content Time	0008,0033	TM		ALWAYS	AUTO
Anatomic Region Sequence	0008,2218	SQ		ALWAYS	USER
> [Code Sequence Macro]				ALWAYS	USER
Instance Number	0020,0013	IS		ALWAYS	AUTO
Image Comments	0020,4000	LT		ALWAYS	USER

9.1.7.8.1 Image Type Values

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
 - ORIGINAL: Identifies an Original Image, for all raw data and reconstructed images
 - DERIVED: Identifies an implementation specific Derived Image
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
 - PRIMARY: Identifies a Primary Image
 - SECONDARY: not used
- Value 3 identifies any Image IOD-specific specialization. The following terms are defined:
 - TOMO: identifies a tomographic projection image
 - GATED TOMO: not used
 - RECON TOMO: identifies a reconstructed tomographic image.
 - STATIC: identifies a non-gated non-phased planar image
 - GATED: identifies a multi-gated planar image
 - DYNAMIC: identifies a multi-phased planar image
 - WHOLEBODY: identifies a whole-body planar image
- Value 4 contains NM specific values:
 - EMISSION: identifies an image acquired and/or reconstructed from Emission source
 - TRANSMISSION: identifies an image acquired and/or reconstructed from Transmission source

9.1.7.9 Acquisition Context Module Attributes

Table 124: Acquisition Context Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO
>Concept Name Code Sequence	0040,A043	SQ	Empty for non-cardiac coded terms, required for Cardiac coded terms	ANAP	AUTO
>> [Code Sequence Macro]				ANAP	AUTO
>Concept Code Sequence	0040,A168	SQ	Empty for non-cardiac coded terms, required for Cardiac coded terms	ANAP	AUTO
>> [Code Sequence Macro]				ANAP	AUTO
>Value Type	0040,A040	CS	CODE	ANAP	FIXED
Acquisition Context Description	0040,0556	ST		ANAP	AUTO

9.1.7.10 Image Pixel Module Attributes

Table 125: Image Pixel Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Rows	0028,0010	US		ALWAYS	AUTO
Columns	0028,0011	US		ALWAYS	AUTO
Pixel Representation	0028,0103	US		ALWAYS	AUTO
Smallest Image Pixel Value	0028,0106	US or SS		ALWAYS	AUTO
Largest Image Pixel Value	0028,0107	US or SS		ALWAYS	AUTO
Pixel Data	7FE0,0010	OB		ALWAYS	AUTO

9.1.7.11 NM Image Pixel Module Attributes

Table 126: NM Image Pixel Module Attributes

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED
Bits Stored	0028,0101	US	16	ALWAYS	FIXED
High Bit	0028,0102	US	15	ALWAYS	FIXED

9.1.7.12 Multi-frame Module Attributes

Table 127: Multi-frame Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frames	0028,0008	IS		ALWAYS	AUTO

9.1.7.13 NM Multi-frame Module Attributes

Table 128: NM Multi-frame Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO
Energy Window Vector	0054,0010	US		ALWAYS	AUTO
Number of Energy Windows	0054,0011	US		ALWAYS	AUTO
Detector Vector	0054,0020	US		ALWAYS	AUTO
Number of Detectors	0054,0021	US		ALWAYS	AUTO
Phase Vector	0054,0030	US		ALWAYS	AUTO
Number of phases	0054,0031	US		ALWAYS	AUTO
Rotation Vector	0054,0050	US		ALWAYS	AUTO
Number of Rotations	0054,0051	US		ALWAYS	AUTO
RR Interval Vector	0054,0060	US		ALWAYS	AUTO
Number of RR Intervals	0054,0061	US		ALWAYS	AUTO
Time Slot Vector	0054,0070	US		ALWAYS	AUTO
Number of Time Slots	0054,0071	US		ALWAYS	AUTO
Slice Vector	0054,0080	US		ALWAYS	AUTO
Number of Slices	0054,0081	US		ALWAYS	AUTO
Angular View Vector	0054,0090	US		ALWAYS	AUTO
Time Slice Vector	0054,0100	US		ALWAYS	AUTO

9.1.7.14 NM Image Module Attributes

Table 129: NM Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Counts Accumulated	0018,0070	IS		ALWAYS	AUTO
Acquisition Termination Condition	0018,0071	CS		ALWAYS	AUTO
Trigger Source or Type	0018,1061	LO		ALWAYS	AUTO
Table Height	0018,1130	DS		ALWAYS	AUTO

Table Traverse	0018,1131	DS		ALWAYS	AUTO
Actual Frame Duration	0018,1242	IS		ALWAYS	AUTO
Scan Velocity	0018,1300	DS		ALWAYS	AUTO
Whole Body Technique	0018,1301	CS		ALWAYS	AUTO
Scan Length	0018,1302	IS		ALWAYS	AUTO
Corrected Image	0028,0051	CS	See Note	ALWAYS	AUTO

Note: SPECTsyngo adds the following Defined Terms for Corrected Image:

- a. DSC Distortion Corrected (only for data acquired with Focusing Collimator)
- b. RESPMOT Respiratory Motion Corrected
- c. INTRAMOT Intra Motion Corrected
- d. EMI Extra Modality Information Applied (Reconstruction with Zoning)
- e. DCAL Standard Sensitivity Calibration Applied

9.1.7.15 NM Isotope Module Attributes

Table 130: NM Isotope Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Intervention Drug Information Sequence	0018,0026	SQ		ANAP	AUTO
>Intervention Drug Dose	0018,0028	DS		ALWAYS	USER
>Intervention Drug Name	0018,0034	LO		ALWAYS	USER
>Intervention Drug Start Time	0018,0035	TM		ALWAYS	AUTO
Energy Window Information Sequence	0054,0012	SQ		ALWAYS	AUTO
>Energy Window Range Sequence	0054,0013	SQ		ALWAYS	AUTO
>>Energy Window Lower Limit	0054,0014	DS		ALWAYS	AUTO
>>Energy Window Upper Limit	0054,0015	DS		ALWAYS	AUTO
>Energy Window Name	0054,0018	SH		ALWAYS	AUTO
Radiopharmaceutical Information Sequence	0054,0016	SQ		ALWAYS	AUTO
>Radiopharmaceutical	0018,0031	LO		ALWAYS	USER
>Radiopharmaceutical Volume	0018,1071	DS		ALWAYS	USER
>Radiopharmaceutical Start Time	0018,1072	TM		ALWAYS	USER
>Radionuclide Total Dose	0018,1074	DS		ALWAYS	USER
>Radiopharmaceutical Start DateTime	0018,1078	DT	See Note	ALWAYS	USER
>Radionuclide Code Sequence	0054,0300	SQ		ALWAYS	AUTO
>> [Code Sequence Macro]				ALWAYS	AUTO
>Radiopharmaceutical Code Sequence	0054,0304	SQ		ANAP	USER
>> [Code Sequence Macro]				ALWAYS	USER

Note: SPECTsyngo extends the module to include this as Type 3 attribute.

9.1.7.16 NM Detector Module Attributes

Table 131: NM Detector Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Detector Information Sequence	0054,0022	SQ		ALWAYS	AUTO
>Radial Position	0018,1142	DS		ALWAYS	AUTO

>Center of Rotation Offset	0018,1145	DS		ALWAYS	AUTO
>Field of View Shape	0018,1147	CS	RECTANGLE	ALWAYS	FIXED
>Field of View Dimensions	0018,1149	IS		ALWAYS	AUTO
>Collimator Grid Name	0018,1180	SH		ALWAYS	AUTO
>Collimator Type	0018,1181	CS		ALWAYS	AUTO
>Focal Distance	0018,1182	IS		ALWAYS	AUTO
>X Focus Center	0018,1183	DS		ALWAYS	AUTO
>Y Focus Center	0018,1184	DS		ALWAYS	AUTO
>Image Position Patient	0020,0032	DS		ALWAYS	AUTO
>Image Orientation Patient	0020,0037	DS		VNAP	AUTO
>Zoom Factor	0028,0031	DS		ALWAYS	AUTO
>Zoom Center	0028,0032	DS		ALWAYS	AUTO
>Start Angle	0054,0200	DS	See Note	ALWAYS	AUTO
> View Code Sequence	0054,0220	SQ		ALWAYS	USER
>> [Code Sequence Macro]				ALWAYS	USER

Note: SPECTsyngo extends the attribute to TOMO, GATED TOMO, RECON TOMO, and RECON GATED TOMO types.

9.1.7.17 NM Tomo Acquisition Module Attributes

Table 132: NM Tomo Acquisition Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Rotation Information Sequence	0054,0052	SQ		ALWAYS	AUTO
>Table Height	0018,1130	DS		ALWAYS	AUTO
>Table Traverse	0018,1131	DS		ALWAYS	AUTO
>Rotation Direction	0018,1140	CS		ALWAYS	AUTO
>Radial Position	0018,1142	DS	See Note	ALWAYS	AUTO
>Scan Arc	0018,1143	DS		ALWAYS	AUTO
>Angular Step	0018,1144	DS		ALWAYS	AUTO
>Actual Frame Duration	0018,1242	DS		ALWAYS	AUTO
>Number of Frames in Rotation	0054,0053	DS		ALWAYS	AUTO
>Start Angle	0054,0200	DS		ALWAYS	AUTO
Type of Detector Motion	0054,0202	CS		ALWAYS	AUTO

Note: SPECTsyngo stores the complete Radial Positions for all projection views only in NM Detector Module of TOMO image.

9.1.7.18 NM Multi-gated Acquisition Module Attributes

Table 133: NM Multi-gated Acquisition Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Beat Rejection Flag	0018,1080	CS		ALWAYS	AUTO
PVC Rejection	0018,1085	LO		ALWAYS	AUTO
Skip Beats	0018,1086	IS		ALWAYS	AUTO
Heart Rate	0018,1088	IS		ALWAYS	AUTO
Gated Information Sequence	0054,0062	SQ		ALWAYS	AUTO
>Cardiac Framing Type	0018,1064	LO	See Note	ALWAYS	FIXED

>Data Information Sequence	0054,0063	SQ		ALWAYS	AUTO
>>Nominal Interval	0018,1062	IS		ALWAYS	AUTO
>>Frame Time	0018,1063	DS		ALWAYS	AUTO
>>Low R-R Value	0018,1081	IS		ALWAYS	AUTO
>>High R-R Value	0018,1082	IS		ALWAYS	AUTO
>>Intervals Acquired	0018,1083	IS		ALWAYS	AUTO
>>Intervals Rejected	0018,1084	IS		ALWAYS	AUTO
>>Time Slot Information Sequence	0054,0072	SQ		ALWAYS	AUTO
>>>Time Slot Time	0054,0073	DS		ALWAYS	AUTO

Note: SPECTsyngo adds the following Defined Terms for Cardiac Framing Type (0018,1064):

PHASED

Full R-R divided into equal time slots.

9.1.7.19 NM Phase Module Attributes

Table 134: NM Phase Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Phase Information Sequence	0054,0032	SQ		ALWAYS	AUTO
>Actual Frame Duration	0018,1242	IS		ALWAYS	AUTO
>Number of Frames in Phase	0054,0033	US		ALWAYS	AUTO
>Phase Delay	0054,0036	IS		ALWAYS	AUTO
>Pause Between Frames	0054,0038	IS		ALWAYS	AUTO
>Phase Description	0054,0039	CS		ALWAYS	USER

9.1.7.20 NM Reconstruction Module Attributes

Table 135: NM Reconstruction Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Slice Thickness	0018,0050	DS		ALWAYS	AUTO
Spacing Between Slices	0018,0088	DS		ALWAYS	AUTO
Reconstruction Diameter	0018,1100	DS		ALWAYS	AUTO
Convolution Kernel	0018,1210	SH	See Note	ALWAYS	AUTO
Slice Progression Direction	0054,0500	CS		ANAP	AUTO

Note: SPECTsyngo records recon algorithm (a), post recon filter (d), and attenuation correction source (c) in Convolution Kernel (0018, 1210):

- Algorithm name (e.g., FBP, 3DOSEM, OSCGMM, etc), iterations (e.g., 24i), subsets (e.g., 4s).
- Filter name (e.g., Gaussian, BTW, etc), filter parameters (e.g., 8mm).
- AC source (e.g., NOAC, CTAC or SLAC).

9.1.7.21 Curve Module Attributes

Table 136: Curve Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Curve Dimensions	5000,0005	US		ALWAYS	AUTO
Number of Points	5000,0010	US		ALWAYS	AUTO
Type of Data	5000,0020	CS		ALWAYS	AUTO
Curve Description	5000,0022	LO		ALWAYS	AUTO
Axis Units	5000,0030	SH		ALWAYS	AUTO

Axis Labels	5000,0040	SH		ALWAYS	AUTO
Data Value Representation	5000,0103	US		ALWAYS	AUTO
Minimum Coordinate Value	5000,0104	US		ALWAYS	AUTO
Maximum Coordinate Value	5000,0105	US		ALWAYS	AUTO
Curve Range	5000,0106	SH		ALWAYS	AUTO
Curve Data Descriptor	5000,0110	US		ALWAYS	AUTO
Coordinate Start Value	5000,0112	US		ALWAYS	AUTO
Coordinate Step Value	5000,0114	US		ALWAYS	AUTO
Curve Label	5000,2500	LO		ALWAYS	AUTO
Curve Data	5000,3000	OW		ALWAYS	AUTO

9.1.7.22 VOI LUT Module Attributes

Table 137: VOI LUT Module

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

9.1.7.23 SOP Common Module Attributes

Table 138: SOP Common Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS		ALWAYS	AUTO
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.20	ALWAYS	FIXED
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO
Timezone Offset From UTC	0008,0201	SH		ALWAYS	AUTO

9.1.7.24 Meta Information and Code Sequence Macro

Table 139: Meta Info and Code Sequence Macro

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Group Length	0002,0000	UL		ALWAYS	AUTO
Media Storage SOP Class UID	0002,0002	UI	1.2.840.10008.5.1.4.1.1.20	ALWAYS	FIXED
Media Storage SOP Instance UID	0002,0003	UI		ALWAYS	AUTO
Transfer Syntax UID	0002,0010	UI		ALWAYS	AUTO
[Code Sequence Macro]					
> Code Value	0008,0100	SH			
> Coding Scheme Designator	0008,0102	SH	See Note		
> Code Meaning	0008,0104	LO			

Note: SPECTsyngo generally uses SNOMED RT (SRT) codes even though the current version of the DICOM standard uses SNOMED CT (SCT) codes as coding scheme designator.

9.1.8 PET Image Storage SOP Class

Table 140: IOD of PET Image Storage SOP Class Instances

IE	Module	Reference	Usage
Patient	Patient	9.1.8.1	ALWAYS
Study	General Study	9.1.8.2	ALWAYS
	Patient Study	9.1.8.3	ALWAYS
Series	General Series	9.1.8.4	ALWAYS
	PET Series	9.1.8.5	ALWAYS
	PET Isotope	9.1.8.6	ALWAYS
	NM/PET Patient Orientation	9.1.8.7	ALWAYS
Frame of Reference	Frame of Reference	9.1.8.8	ALWAYS
Equipment	General Equipment	9.1.8.9	ALWAYS
Image	General Image	9.1.8.10	ALWAYS
	Acquisition Context	9.1.8.11	CONDITIONAL
	Image Pixel	9.1.8.12	ALWAYS
	Image Plane	9.1.8.13	ALWAYS
	PET Image	9.1.8.14	ALWAYS
	VOI LUT	9.1.8.15	ALWAYS
	SOP Common	9.1.8.16	ALWAYS

9.1.8.1 Patient Module Attributes

Table 141: Patient Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER
Patient ID	0010,0020	LO		ALWAYS	MWL, USER
Issuer of Patient ID	0010,0021	LO		ANAP	MWL
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER
Patients Birth Time	0010,0032	TM		ANAP	MWL
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER
Other Patient IDs	0010,1000	LO		ANAP	MWL
Other Patient Names	0010,1001	PN		ANAP	MWL
Ethnic Group	0010,2160	SH		ANAP	MWL, USER

9.1.8.2 General Study Module Attributes

Table 142: General Study Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA		ALWAYS	AUTO
Study Time	0008,0030	TM		ALWAYS	AUTO
Accession Number	0008,0050	SH		VNAP	MWL, USER
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER
Study Description	0008,1030	LO		ALWAYS	MWL, USER

Procedure Code Sequence	0008,1032	SQ		ANAP	MWL
>[Code Sequence Macro]				ANAP	MWL
Study Instance UID	0020,000D	UI		ALWAYS	MWL, AUTO
Study ID	0020,0010	SH		VNAP	MWL, USER
Requesting Physician	0032,1032	PN	See Note	VNAP	MWL

Note: SPECTsyngo extends the module to include this as Type 3 attribute.

9.1.8.3 Patient Study Module Attributes

Table 143: Patient Study Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Admitting Diagnoses Description	0008,1080	LO		ANAP	MWL
Patient's Age	0010,1010	AS		ANAP	MWL, USER
Patient's Size	0010,1020	DS		ANAP	MWL, USER
Patient's Weight	0010,1030	DS		ALWAYS	MWL, USER
Occupation	0010,2180	SH		ANAP	MWL
Admission ID	0038,0010	LO		ANAP	MWL

9.1.8.4 General Series Module Attributes

Table 144: General Series Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA		ALWAYS	AUTO
Series Time	0008,0031	TM		ALWAYS	AUTO
Modality	0008,0060	CS	PT	ALWAYS	FIXED
Series Description	0008,103E	LO		ANAP	USER
Operators' Name	0008,1070	PN		ANAP	MWL, USER
Performing Physician's Name	0008,1050	PN		ALWAYS	MWL
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	MWL
>Referenced SOP Class UID	0008,1150	UI		ANAP	MWL
>Referenced SOP Instance UID	0008,1155	UI		ANAP	MWL
Related Series Sequences	0008,1250	SQ		ANAP	AUTO
>Study Instance UID	0020,000D	UI		ANAP	AUTO
>Series Instance UID	0020,000E	UI		ANAP	AUTO
>Purpose Of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO
>>[Code Sequence Macro]				ANAP	AUTO
Body Part Examined	0018,0015	CS		ALWAYS	AUTO, USER
Protocol Name	0018,1030	LO		ANAP	USER
Patient Position	0018,5100	CS		ALWAYS	AUTO
Request Attributes Sequence	0040,0275	SQ		ALWAYS	AUTO
>Accession Number	0008,0050	SH		ANAP	MWL, USER
>Study Instance UID	0020,000D	UI		ALWAYS	MWL, AUTO
>Referenced Study Sequence	0008,1110	SQ		ALWAYS	MWL, AUTO
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL, AUTO

>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL, AUTO
>Requested Procedure Description	0032,1060	LO		ALWAYS	MWL
> Requested Procedure Code Sequence	0032,1064	SQ		ANAP	MWL
>>[Code Sequence Macro]				ANAP	MWL
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	MWL
> Scheduled Procedure Code Sequence	0040,0008	SW		ANAP	MWL
>>[Code Sequence Macro]				ANAP	MWL
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL
>Requested Procedure ID	0040,1001	SH		ANAP	MWL
>Reason For The Requested Procedure	0040,1002	LO		ANAP	MWL
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO
Performed Procedure Step ID	0040,0253	SH		ANAP	MWL
Performed Procedure Step Description	0040,0254	LO		ANAP	MWL
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Series Number	0020,0011	IS		ALWAYS	AUTO

9.1.8.5 PET Series Module Attributes

Table 145: PET Series Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Termination Condition	0018,0071	CS		ALWAYS	AUTO
Number of Slices	0054,0081	US		ALWAYS	AUTO
Type of Detector Motion	0054,0202	CS		ALWAYS	AUTO
Reconstruction Diameter	0018,1100	DS		ALWAYS	AUTO
Field of View Shape	0018,1147	CS	RECTANGLE	ALWAYS	FIXED
Field of View Dimension(s)	0018,1149	IS		ALWAYS	AUTO
Collimator/Grid Name	0018,1180	SH		ALWAYS	AUTO
Collimator Type	0018,1181	CS		ALWAYS	AUTO
Convolution Kernel	0018,1210	SH	See Note 1	ALWAYS	AUTO
Corrected Image	0028,0051	CS	See Note 2	ALWAYS	AUTO
Energy Window Range Sequence	0054,0013	SQ		ALWAYS	AUTO
>Energy Window Lower Limit	0054,0014	DS		ALWAYS	AUTO
>Energy Window Upper Limit	0054,0015	DS		ALWAYS	AUTO
Series Type	0054,1000	CS		ALWAYS	AUTO
Units	0054,1001	CS		ALWAYS	AUTO
Counts Source	0054,1002	CS		ALWAYS	FIXED
Attenuation Correction Method	0054,1101	LO		ALWAYS	AUTO

Decay Correction	0054,1102	CS		ALWAYS	AUTO
Reconstruction Method	0054,1103	LO		ALWAYS	AUTO
Scatter Correction Method	0054,1105	LO		ALWAYS	AUTO

Note 1: **SPECTsyngo** records recon algorithm (a), post recon filter (d), and attenuation correction source (c) in Convolution Kernel (0018, 1210):

- Algorithm name (e.g., FBP, 3DOSEM, OSCGMM, etc), iterations (e.g., 24i), subsets (e.g., 4s).
- Filter name (e.g., Gaussian, BTW, etc), filter parameters (e.g., 8mm).
- AC source (e.g., NOAC, CTAC or SLAC).

Note 2: **SPECTsyngo** adds the following Defined Terms for Corrected Image:

- RESPMOT Respiratory Motion Corrected
- INTRAMOT Intra Motion Corrected
- EMI Extra Modality Information Applied (Reconstruction with Zoning)
- VSENS 3D Sensitivity Calibration Applied

9.1.8.6 PET Isotope Module Attributes

Table 146: PET Isotope Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Intervention Drug Information Sequence	0018,0026	SQ		ANAP	AUTO
>Intervention Drug Dose	0018,0028	DS		ALWAYS	USER
>Intervention Drug Name	0018,0034	LO		ALWAYS	USER
>Intervention Drug Start Time	0018,0035	TM		ALWAYS	AUTO
Radiopharmaceutical Information Sequence	0054,0016	SQ		ALWAYS	AUTO
>Radiopharmaceutical	0018,0031	LO		ALWAYS	USER
>Radiopharmaceutical Volume	0018,1071	DS		ALWAYS	USER
>Radiopharmaceutical Start Time	0018,1072	TM		ALWAYS	USER
>Radionuclide Total Dose	0018,1074	DS		ALWAYS	USER
>Radionuclide Half Life	0018,1075	DS		ALWAYS	AUTO
>Radiopharmaceutical Start DateTime	0018,1078	DT		ALWAYS	USER
>Radionuclide Code Sequence	0054,0300	SQ		ALWAYS	AUTO
>>[Code Sequence Macro]				ALWAYS	AUTO
>Radiopharmaceutical Code Sequence	0054,0304	SQ		ANAP	USER
>>[Code Sequence Macro]				ANAP	USER

9.1.8.7 NM/PET Patient Orientation Module Attributes

Table 147: NM/PET Patient Orientation Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Orientation Code Sequence	0054,0410	SQ		ALWAYS	AUTO
> [Code Sequence Macro]				ALWAYS	AUTO
>Patient Orientation Modifier Code Sequence	0054,0412	SQ			
>> [Code Sequence Macro]				ALWAYS	AUTO
Patient Gantry Relationship Code Sequence	0054,0414	SQ		ALWAYS	AUTO
>[Code Sequence Macro]				ALWAYS	AUTO

9.1.8.8 Frame of Reference Module Attributes

Table 148: Frame of Reference Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO
Position Reference Indicator	0020,1040	LO		EMPTY	AUTO

9.1.8.9 General Equipment Module Attributes

Table 149: General Equipment Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Siemens Healthineers	ALWAYS	FIXED
Institution Name	0008,0080	LO		ALWAYS	CONFIG
Institution Address	0008,0081	ST		ANAP	CONFIG
Station Name	0008,1010	SH		ALWAYS	CONFIG
Institutional Department Name	0008,1040	LO		ALWAYS	CONFIG
Manufacturer's Model Name	0008,1090	LO	Symbia Pro.specta Q3 Symbia Pro.specta X3 Symbia Pro.specta X7	ALWAYS	FIXED
Device Serial Number	0018,1000	LO		ALWAYS	FIXED
Software Versions	0018,1020	LO	SPECTsyngo VA20A	ALWAYS	FIXED
Date of Last Calibration	0018,1200	DA		ALWAYS	AUTO
Time of Last Calibration	0018,1201	TM		ALWAYS	AUTO

9.1.8.10 General Image Module Attributes

Table 150: General Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	CS	Section 9.1.8.10.1	ALWAYS	AUTO
Acquisition Date	0008,0022	DA		ALWAYS	AUTO
Content Date	0008,0023	DA		ALWAYS	AUTO
Acquisition Datetime	0008,002A	DA		ALWAYS	AUTO
Acquisition Time	0008,0032	TM		ALWAYS	AUTO
Content Time	0008,0033	TM		ALWAYS	AUTO
Instance Number	0020,0013	IS		ALWAYS	AUTO
Image Comments	0020,4000	LT		ALWAYS	USER

9.1.8.10.1 Image Type Values

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
 - ORIGINAL: Identifies an Original Image, for all raw data and reconstructed images
 - DERIVED: not used
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
 - PRIMARY: Identifies a Primary Image
 - SECONDARY: not used

9.1.8.11 Acquisition Context Module Attributes

Table 151: Acquisition Context Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO
>Concept Name Code Sequence	0040,A043	SQ	Empty for non-cardiac coded terms, required for Cardiac coded terms	ANAP	AUTO
>>[Code Sequence Macro]				ANAP	AUTO
>Concept Code Sequence	0040,A168	SQ	Empty for non-cardiac coded terms, required for Cardiac coded terms	ANAP	AUTO
>>[Code Sequence Macro]				ANAP	AUTO
>Value Type	0040,A040	CS	CODE	ANAP	FIXED
Acquisition Context Description	0040,0556	ST		ANAP	AUTO

9.1.8.12 Image Pixel Module Attributes

Table 152: Image Pixel Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED
Rows	0028,0010	US		ALWAYS	AUTO
Columns	0028,0011	US		ALWAYS	AUTO
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED
Bits Stored	0028,0101	US	16	ALWAYS	FIXED
High Bit	0028,0102	US	15	ALWAYS	FIXED
Pixel Representation	0028,0103	US		ALWAYS	AUTO
Smallest Image Pixel Value	0028,0106	US or SS		ALWAYS	AUTO
Largest Image Pixel Value	0028,0107	US or SS		ALWAYS	AUTO

9.1.8.13 Image Plane Attributes

Table 153: Image Plane Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO
Slice Thickness	0018,0050	DS		ALWAYS	AUTO
Slice Location	0020,1041	DS		ALWAYS	AUTO
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO

9.1.8.14 PET Image Module Attributes

Table 154: PET Image Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Reference Time	0054,1300	DS		ALWAYS	AUTO
Decay Factor	0054,1321	DS		ALWAYS	AUTO
Dose Calibration Factor	0054,1322	DS		ALWAYS	AUTO
Image Index	0054,1330	US		ALWAYS	AUTO
Anatomic Region Sequence	0008,2218	SQ		ALWAYS	USER
>[Code Sequence Macro]				ALWAYS	USER
Actual Frame Duration	0018,1242	IS		ALWAYS	AUTO
Rescale Intercept	0028,1052	DS	0	ALWAYS	FIXED
Rescale Slope	0028,1053	DS		ALWAYS	AUTO

9.1.8.15 VOI LUT Module Attributes

Table 155: VOI LUT Module

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

9.1.8.16 SOP Common Module Attributes

Table 156: SOP Common Module

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS		ALWAYS	AUTO
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.128	ALWAYS	FIXED
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO
Timezone Offset From UTC	0008,0201	SH		ALWAYS	AUTO

9.1.8.17 Meta Information and Code Sequence Macro

Table 157: Meta Info and Code Sequence Macro

DICOM Attribute Name	Tag	VR	Value	Presence of Value	Source
Group Length	0002,0000	UL		ALWAYS	AUTO
Media Storage SOP Class UID	0002,0002	UI	1.2.840.10008.5.1.4.1.1.128	ALWAYS	FIXED
Media Storage SOP Instance UID	0002,0003	UI		ALWAYS	AUTO
Transfer Syntax UID	0002,0010	UI		ALWAYS	AUTO
[Code Sequence Macro]					
> Code Value	0008,0100	SH			
> Coding Scheme Designator	0008,0102	SH	See Note		
> Code Meaning	0008,0104	LO			

Note: SPECTsyngo generally uses SNOMED RT (SRT) codes even though the current version of the DICOM standard uses SNOMED CT (SCT) codes as coding scheme designator.

9.2 Data Dictionary of Private Attributes

Table 158: Private Data Element Dictionary lists private attributes created by **SPECTsyngo** to extend CT SOP Class, which may be included in the generated instances. These private attributes may be deprecated or replaced with standard attributes in the future.

Table 158: Private Data Element Dictionary

DICOM Tag	Name	VR	VM
(0029,SIEMENS CSA ENVELOPE,10)	syngo Report Data	OB	1
(0029,SIEMENS CSA ENVELOPE,11)	syngo Report Presentation	OB	1
(0029,SIEMENS CSA HEADER,08)	Modality Image Header Type	CS	1
(0029,SIEMENS CSA HEADER,09)	Modality Image Header Version	LO	1
(0029,SIEMENS CSA HEADER,10)	Modality Image Header Info	OB	1
(0029,SIEMENS CSA HEADER,18)	Modality Series Header Type	CS	1
(0029,SIEMENS CSA HEADER,19)	Modality Series Header Version	LO	1
(0029,SIEMENS CSA HEADER,20)	Modality Series Header Info	OB	1
(0029,SIEMENS CSA NON-IMAGE,08)	Modality Data Header Type	CS	1
(0029,SIEMENS CSA NON-IMAGE,09)	Modality Data Header Version	LO	1
(0029,SIEMENS CSA NON-IMAGE,10)	Modality Data Header Info	OB	1
(7FE1,SIEMENS CSA NON-IMAGE,10)	Modality Data	OB	1
(0029,SIEMENS CSA REPORT,08)	syngo Report Type	CS	1
(0029,SIEMENS CSA REPORT,09)	syngo Report Version	LO	1
(0029,SIEMENS CSA REPORT,15)	SR Variant	US	1
(0029,SIEMENS CSA REPORT,17)	SC SOP Instance UID	UI	1
(0029,SIEMENS MEDCOM HEADER,40)	Application Header Sequence	SQ	1
(0029,SIEMENS MEDCOM HEADER,41)	Application Header Type	CS	1
(0029,SIEMENS MEDCOM HEADER,42)	Application Header ID	LO	1
(0029,SIEMENS MEDCOM HEADER,43)	Application Header Version	LO	1
(0029,SIEMENS MEDCOM HEADER,44)	Application Header Info	OB	1
(0029,SIEMENS MEDCOM HEADER,70)	Siemens Link Sequence	SQ	1-n
(0029,SIEMENS MEDCOM HEADER,71)	Referenced Tag	AT	1
(0029,SIEMENS MEDCOM HEADER,72)	Referenced Tag Type	CS	1
(0029,SIEMENS MEDCOM HEADER,73)	Referenced Value Length	UL	1
(0029,SIEMENS MEDCOM HEADER,74)	Referenced Object Device Type	CS	1
(0029,SIEMENS MEDCOM HEADER,75)	Referenced Object Device Location	OB	1
(0029,SIEMENS MEDCOM HEADER,76)	Referenced Object ID	OB	1
(0029,SIEMENS MEDCOM HEADER,77)	Referenced Object Offset	UL	1
(0029,SIEMENS MEDCOM HEADER2,60)	Series Work Flow Status	LO	1
(0029,SIEMENS SYNGO 3D FUSION MATRIX,08)	Object Series Instance UID	UI	1
(0029,SIEMENS SYNGO 3D FUSION MATRIX,09)	Model Series Instance UID	UI	1
(0029,SIEMENS SYNGO 3D FUSION MATRIX,10)	Matrix Referenced Series Instance UID	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,00)	Presentation Name	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,01)	Presentation Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,02)	Advanced Presentation Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,03)	Time Point Sequence	SQ	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,04)	Base Image Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,05)	Overlay Image Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,06)	Registration Instance Sequence	SQ	0-1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,07)	Real World Value Mapping Instance Sequence	SQ	0-1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,08)	Measurement Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,09)	Measurement UID	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,10)	Segmentation Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,11)	Segmentation UID	SH	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,12)	Navigation Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,13)	Navigation Name	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,14)	Auto Navigation Direction	LO	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,15)	Auto Navigation Frame Rate	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,16)	Auto Navigation Mode	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,17)	Auto Navigation Realtime Speed	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,18)	Auto Navigation Strategy	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,19)	Auto Navigation Realtime Flag	SH	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,20)	Index Navigation Current Index	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,21)	Index Auto Navigation Skipping Degree	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,22)	Volume Navigation Minimum Pixel Spacing	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,23)	Volume Navigation Scroll Unit	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,24)	Volume Navigation Step Size	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,25)	Volume Navigation Jump Size	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,26)	Referenced Registration Number	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,27)	Real World Value Mapping UID	SH	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,28)	Channel Alpha Value	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,30)	Measurement Application Name	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,31)	Measurement Data Sequence	SQ	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,32)	Measurement Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,33)	Measurement Frame of Reference UID	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,34)	Measurement Uid	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,35)	Measurement Application Number	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,36)	Measurement Application Number Prefix Text	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,37)	Measurement Graphic Is Visible Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,38)	Referenced Syngo Uid	UI	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,39)	Clinical Finding Uid	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3A)	Measurement Evaluation String Value	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3B)	Measurement Evaluation Integer Value	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3C)	Measurement Evaluation Decimal Value	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3D)	Measurement Line Show Center Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3E)	Measurement Angle Show ArrowTip Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,3F)	Camera Home Settings Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,40)	Camera Zoom	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,41)	Camera Position	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,42)	Camera Orientation	DS	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,43)	Camera Far Clip Plane	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,44)	Camera Near Clip Plane	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,46)	Camera ViewPort Size	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,47)	Camera Aspect Ratio	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,48)	Camera Projection Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,49)	Camera Field of View	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4A)	Camera Image Plane Distance	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4B)	Camera Image Maximum Height	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4C)	Camera Image Minimum Height	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4D)	ParallelShift Interval MM	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4E)	Measurement ArrowTip Size	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,4F)	Measurement ArrowTip Size ScalingFactor	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,50)	Renderer Vertex Is Characteristic Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,51)	Renderer Thickness Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,52)	Renderer Threshold	DS	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,53)	Renderer Material	DS	4-8
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,54)	Renderer DirectionalLight Color	DS	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,55)	Renderer DirectionalLight Direction	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,56)	Renderer DirectionalLight TwoSide Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,57)	Renderer PWL TransferFunction Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,58)	Renderer PWL Vertex Index	IS	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,59)	Renderer PWL Vertex Color	DS	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5A)	Renderer Is Camera Required Flag	CS	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5B)	Renderer Do Depth Test Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5C)	Renderer DirectionalLight Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5D)	Renderer Thickness Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5E)	Renderer Slice Spacing Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,5F)	Renderer Sampling Distance	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,60)	Renderer Initial Sampling Distance	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,61)	Segmentation Display Data Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,62)	Segmentation Display Data UID	ST	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,63)	Segmentation Display Parameter Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,64)	Segmentation Display Parameter Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,65)	Segmentation Display Visibility	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,66)	Segmentation Display Color	DS	4
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,67)	Segmentation Display Is Selected Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,68)	Segmentation Additional Information Blob	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,69)	Hash Code Value	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,6A)	Segmentation Version Identifier	LO	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,6B)	Segmentation Lock Mode	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,70)	Segmentation Volume Size	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7A)	Segmentation Volume StorageDataType	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7B)	Segmentation Volume Model Matrix	FL	16
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7C)	Segmentation Display Is Applied Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7D)	Display Representation Instance Identifier	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,71)	Registration Referenced Frames	UI	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,72)	Registration Referenced Registrations	UI	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,73)	Registration Creation Algorithm Name	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,74)	ECG Graphic Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,75)	Hidden Pixel Spacing	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,76)	Renderer Edge Enhancement Param	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,77)	Renderer Gradient Modulated Opacity Param	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,78)	Renderer Volume Smoothing Param	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7E)	Fused Presentation LUT Shape	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,7F)	Overlay Graphic VisibleFlag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,80)	Camera Rotation Axis	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,81)	Overlay Hidden Display Attributes	SL	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,82)	Presentation State Group Identifier	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,83)	Temporary Smallest Image Pixel Value	US	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,84)	Camera Rotation Center	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,85)	Camera Rotation Center Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,86)	Camera Parallel Epiped	DS	12
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,87)	Camera Max Zoom In Factor	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,88)	Camera Min Zoom In Factor	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,89)	Temporary Largest Image Pixel Value	US	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8A)	Camera Rotation Axis Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8B)	Measurement Surface Normal	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8C)	Measurement Ellipsoid Model Matrix	FL	16
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8D)	Measurement Evaluation DataRole ID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,8E)	Measurement Algorithm Type	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,91)	Measurement Evaluation DataRole Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,93)	Measurement Evaluation Sequence	SQ	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,94)	Measurement Evaluation Value	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,95)	Measurement Evaluation ID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,96)	Measurement Data Points	FL	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,97)	Measurement Data Angles	FL	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,98)	Measurement Data Slice	FD	9
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,99)	Measurement Data Slice Thickness	FL	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9A)	Measurement Referenced Frames Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9B)	Measurement Evaluation Longest Distance	DS	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9C)	Measurement Evaluation Centroid	DS	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9D)	Measurement Data Bounding Box	FL	6
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9E)	Measurement Text	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9F)	Measurement Diameter	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A0)	Image Rotation Fractional	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A1)	Preset Name	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A2)	Fusion LUT Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A3)	Fusion LUT Is Active Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A4)	Scale To Fit Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A5)	Syngo UID	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A6)	Presentation Version Identifier	UI	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A7)	Presentation Module Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A8)	Presentation Module Type	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A9)	Presentation State Sequence	SQ	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AA)	LUT Inverted Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AB)	Softcopy Voi Lut Viewing Index	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AC)	Displayed Area Bottom Right Hand Corner Fractional	FD	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AD)	Displayed Area Top Left Hand Corner Fractional	FD	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AE)	Measurement Alpha	FL	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,AF)	Measurement Bitmap	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B0)	Current Frame Number	US	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B1)	ImageText View Name	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B2)	ImageText View Content Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B3)	ImageText Line Names	LO	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B4)	ImageText Line Values	LO	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B5)	Measurement Evaluation Text Position Sequence	SQ	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B6)	Measurement Link Evaluation Text Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B7)	Measurement Evaluation Text Position Vector	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B8)	ImageText Alpha Blending Line Value	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B9)	ImageText Visibility	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BA)	ImageText Reduced	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BB)	ImageText Minimal	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BC)	ImageText ViewID	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BD)	Unlinked Image Text View Name	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C1)	Task Data Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C2)	Task Data Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C3)	Task Data Version	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C4)	Task Data Description	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C5)	Task Data	OB	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C6)	Task Data Size	IS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C7)	True Size Type	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C8)	Image Graphics Visibility	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,C9)	Clip Plane Sequence	SQ	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CA)	Clip Plane Center	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CB)	Clip Plane Normal	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CC)	Clip Plane Scale	DS	2
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CD)	Clip Plane Use Thickness Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CE)	Clip Plane Thickness	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CF)	Image Sequence	SQ	1-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D0)	Clip Plane Enable Clip	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D1)	Clip Plane Handle Ratio	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D2)	Clip Plane Bounding Points	DS	24
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D3)	Clip Plane Motion Matrix	DS	16
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D4)	Clip Plane Shift Velocity	DS	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D5)	Clip Plane Enabled Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D6)	Clip Plane Rotate Velocity	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,D7)	Clip Plane Show Graphics Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E0)	Crop Box Size	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E1)	Crop Box Enabled Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E2)	Crop Box Absolute Origin	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E3)	Crop Box Show Graphics Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E4)	Renderer Filter Settings Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E5)	Renderer Energy Conversion Lut	OF	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E6)	Apply Fusion	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,E7)	RepresentationId	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,EE)	Advanced Display Representation Sequence	SQ	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,EF)	Measurement Visibility In View	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F0)	Measurement Label Text	ST	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F1)	Curved Camera Coordinates	DS	0-n
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F2)	Curved Camera Point Of Interest	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F3)	Curved Camera Point Of Interest Usage Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F4)	Curved Camera Thickness	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F5)	Curved Camera Extrusion Length	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F6)	Curved Camera Rotation Axis Mode	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F7)	Curved Camera Roll Rotation Axis	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F8)	Curved Camera View Port Height	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,F9)	Curved Camera Cut Direction	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FA)	Curved Camera Pan Vector	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FB)	Clinical Finding ID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FC)	Measurement Is Circle Flag	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FD)	Measurement Application TypeID	LO	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FE)	Measurement Default Evaluation Text Visibility	CS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,FF)	Measurement Font Height	SL	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,00)	Measurement Min Threshold Value	SL	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,01)	Measurement Max Threshold Value	SL	1
(0029,SIEMENS SYNGO ALPHA CAD,10)	Automatic Landmarking and Parsing of Human Anatomy Version	CS	1
(0029,SIEMENS SYNGO ALPHA CAD,12)	Automatic Landmarking and Parsing of Human Anatomy Body Regions	SQ	1
(7FDF,SIEMENS SYNGO DATA PADDING,FC)	Pixel Data Leading Padding	OB	1
(0087,SIEMENS SYNGO ENCAPSULATED DOCUMENT DATA,20)	Study Model	OB	1
(0087,SIEMENS SYNGO ENCAPSULATED DOCUMENT DATA,30)	Report XML Schema	OB	1
(0087,SIEMENS SYNGO ENCAPSULATED DOCUMENT DATA,40)	Report Identifier	OB	1
(0027,SIEMENS SYNGO ENHANCED IDATASET API,01)	Business Unit Code	CS	1
(0027,SIEMENS SYNGO ENHANCED IDATASET API,02)	Application Type	LO	1
(0027,SIEMENS SYNGO ENHANCED IDATASET API,03)	Application Attributes Sequence	SQ	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,10)	Evidence Document Template ID	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,11)	Evidence Document Template Version	DS	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,20)	Evidence Document Clinical Finding Data	OB	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,21)	Evidence Document Metadata	OB	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,30)	Evidence Document Implementation Version	DS	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,40)	Evidence Document Predecessor	OB	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,50)	Evidence Document Logical ID	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,60)	Evidence Document Application Data	OB	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,70)	Evidence Document Owner Clinical Task Name	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,71)	Evidence Document Owner Task Name	LO	1
(0077,SIEMENS SYNGO EVIDENCE DOCUMENT DATA,80)	Evidence Document Owner Supported Templates	OB	1
(0029,SIEMENS SYNGO FRAME SET,10)	Image Frame Sequence	SQ	1-n

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO FRAME SET,12)	Type of Progression	CS	1
(0029,SIEMENS SYNGO FRAME SET,14)	Representation Level	IS	1
(0029,SIEMENS SYNGO FRAME SET,16)	Representation Information Sequence	SQ	1-n
(0029,SIEMENS SYNGO FRAME SET,18)	Number of Representations	IS	1
(0029,SIEMENS SYNGO FRAME SET,20)	Representation Pixel Offset	IS	1
(0029,SIEMENS SYNGO FUNCTION ASSIGNMENT,01)	Data Reference	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,20)	Object Insertion Date	DA	1
(0009,SIEMENS SYNGO INDEX SERVICE,30)	Instance Object States	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,31)	Series Object States	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,40)	Last Access Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,41)	Delete Protected Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,42)	Received from Archive Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,43)	Archive Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,44)	Location	AE	1
(0009,SIEMENS SYNGO INDEX SERVICE,45)	Logical Deleted Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,46)	Insert Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,47)	Visible Instances on Series Level	IS	1
(0009,SIEMENS SYNGO INDEX SERVICE,48)	Series Archived	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,49)	Visible Instances on Study Level	IS	1
(0009,SIEMENS SYNGO INDEX SERVICE,4A)	Series Completed	IS	1
(0009,SIEMENS SYNGO INDEX SERVICE,4B)	Delete Protection Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,4C)	Delete Protection User	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,4D)	Study Marked Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,4E)	Study Marked User	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,4F)	Series Delete Protected	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,50)	Hidden Instance	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,51)	Frame Number	UL	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,60)	Data Handling Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,61)	Result Status	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,62)	Clinical Result Attribute	US	1
(0009,SIEMENS SYNGO INDEX SERVICE,63)	Instance Origin	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,64)	DM file relative location for store	LT	1
(0009,SIEMENS SYNGO INDEX SERVICE,70)	Header Offset	UL	1
(0009,SIEMENS SYNGO INDEX SERVICE,71)	Study Archived	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,72)	Study Exported	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,73)	Series Exported	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,74)	Instance Exported	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,75)	Study Corrected	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,76)	Study Marked	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,77)	Review	SL	1
(0009,SIEMENS SYNGO INDEX SERVICE,78)	Isotope Module Level	SL	1
(0009,SIEMENS SYNGO INDEX SERVICE,79)	Radionuclide Total Dose on Series level	DS	1
(0009,SIEMENS SYNGO INDEX SERVICE,7A)	Radionuclide Total Dose on Instance level	DS	1
(0009,SIEMENS SYNGO INDEX SERVICE,7B)	Series Radiopharmaceutical Information Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,7C)	Instance Radiopharmaceutical Information Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,80)	Workflow Attribute Sequence	SQ	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,81)	Patient's Name Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,82)	Other Patient Names Attribute Sequence	SQ	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,83)	Name of Physician(s) Reading Study Attribute Sequence	SQ	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,84)	Requesting Physician Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,85)	Referring Physician's Name Attribute Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,86)	Performing Physician's Name Attribute Sequence	SQ	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,87)	Family Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,88)	Given Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,89)	Middle Name	LO	1

DICOM Tag	Name	VR	VM
(0009,SIEMENS SYNGO INDEX SERVICE,8A)	Prefix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8B)	Suffix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8C)	Degree	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8D)	Ideographic Family Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8E)	Ideographic Given Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,8F)	Ideographic Middle Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,90)	Ideographic Prefix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,91)	Ideographic Suffix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,92)	Ideographic Degree	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,93)	Phonetic Family Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,94)	Phonetic Given Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,95)	Phonetic Middle Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,96)	Phonetic Prefix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,97)	Phonetic Suffix	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,98)	Phonetic Degree	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,99)	Study Printed	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,9A)	Series Printed	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,9B)	Instance Printed	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,9C)	User Specified Worklist	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,9D)	User Specified Worklist Study Registration Time	DT	1
(0009,SIEMENS SYNGO INDEX SERVICE,9E)	User Specified Worklist Study Registration User	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,9F)	User Specified Worklist Sequence	SQ	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,A0)	Sender System Device Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,A1)	Instance Repetition Time	DS	1
(0009,SIEMENS SYNGO INDEX SERVICE,A2)	Instance Effective Echo Time	FD	1
(0009,SIEMENS SYNGO INDEX SERVICE,A3)	Instance Inversion Times	FD	1-n
(0009,SIEMENS SYNGO INDEX SERVICE,A4)	Instance Nominal Cardiac Trigger Delay Time	FD	1
(0009,SIEMENS SYNGO INDEX SERVICE,A5)	Instance Diffusion b-value	FD	1
(0009,SIEMENS SYNGO INDEX SERVICE,A6)	Instance Creator Entity	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,A7)	Data Source	AE	1
(0009,SIEMENS SYNGO INDEX SERVICE,A8)	Study Availability	SL	1
(0009,SIEMENS SYNGO INDEX SERVICE,AC)	Detector View Code Sequence	SQ	1
(0009,SIEMENS SYNGO INDEX SERVICE,AD)	Detector Information Code Value	SH	1-2
(0009,SIEMENS SYNGO INDEX SERVICE,AE)	Detector Information Code Meaning	LO	1-2
(0009,SIEMENS SYNGO INDEX SERVICE,AF)	Detector Information Coding Scheme Designator	SH	1-2
(0009,SIEMENS SYNGO INDEX SERVICE,B0)	Relevant Body Part Examined	CS	1
(0009,SIEMENS SYNGO INDEX SERVICE,B1)	Relevant Protocol Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,B2)	Relevant Modality	CS	1
(0009,SIEMENS SYNGO INSTANCE MANIFEST,00)	Temporary Original Header Sequence	SQ	1
(0009,SIEMENS SYNGO INSTANCE MANIFEST,10)	syngo Index Source AE Title	AE	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,02)	Hanging Protocol Excellence Rank	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,06)	Data Sharing Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,08)	Bagging Operations Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,10)	Synchronization Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,12)	Custom Filter Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,14)	Custom Sorter Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,20)	Selector DT Value	DT	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,22)	Selector DA Value	DA	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,24)	Selector TM Value	TM	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,26)	Selector UI Value	UI	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,30)	Custom Property Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,32)	Custom Property Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,34)	Custom Property Name	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,36)	Custom Property Value	LT	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,38)	Layout Property Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,40)	Synchronization Sequence	SQ	1-n

DICOM Tag	Name	VR	VM
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,60)	Viewport Definitions Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,62)	Protocol Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,70)	Display Protocol Name	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,72)	Display Protocol Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,74)	Display Protocol Level	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,76)	Display Protocol Creator	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,78)	Display Protocol Creation Datetime	DT	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7A)	Referenced Data Protocol	UI	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7B)	Original Display Protocol	UI	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7C)	Display Protocol Excellence Rank	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,7E)	Layout Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,80)	Layout Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,82)	Layout Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,84)	Segment Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,86)	Segment Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,88)	Segment Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,8A)	Segment Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,8C)	Tile Horizontal Dimension	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,8E)	Tile Vertical Dimension	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,90)	Fill Order	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,92)	Segment Small Scroll Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,94)	Segment Small Scroll Amount	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,96)	Segment Large Scroll Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,98)	Segment Large Scroll Amount	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,9A)	Segment Overlap Priority	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,9C)	Data Role View Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,9E)	Data Role View Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,A2)	Referenced Data Role	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,A4)	Sharing Enabled	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,A8)	Referenced Data Role Views	US	2-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B0)	Data Protocol Name	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B2)	Data Protocol Description	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B4)	Data Protocol Level	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B6)	Data Protocol Creator	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,B8)	Data Protocol Creation Datetime	DT	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,BA)	Data Protocol Excellence Rank	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,BC)	Data Protocol Definition Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,BE)	Data Role Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C0)	Data Role Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C2)	Data Role Name	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C4)	IsSystem	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C6)	Selector Operations Sequence	SQ	0-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,C8)	Selector Usage Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,CA)	Select by Attribute Presence	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,CC)	Select by Category	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,CE)	Select by Operator	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D0)	Custom Selector Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D2)	Selector Operator	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D4)	Reformatting Required	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D6)	Registration Data Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,D8)	Reference Data Role Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,DA)	Model Data Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,DC)	Model Data Role Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,DE)	Fusion Display Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E0)	Transparency	FD	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E2)	Time Point	CS	1

DICOM Tag	Name	VR	VM
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E4)	First Time Point Token	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E6)	Last Time Point Token	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,E8)	Intermediate Time Point Token	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,EA)	Data Processor Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,EC)	Data Processor Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,EE)	Template Data Role Sequence	SQ	1-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F0)	View Sequence	SQ	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F4)	View Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F6)	Custom Bagging Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,F8)	Referenced Display Segment Number	US	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FA)	Data Role Type	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,46)	Internal Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FC)	Unassigned Flag	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FE)	Initial Display Scroll Position	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,04)	Template Data Role ID	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,16)	Reference Template Data Role ID	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,18)	Model Template Data Role ID	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,28)	Referenced Template Data Role	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,42)	Presentation Creator Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,44)	Cine Navigation Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,48)	Semantic Naming Strategy	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,50)	Parameter String	LO	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,52)	Sorting Order	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,54)	syngo Template Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,56)	Sorter Type	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,58)	Data Display Protocol Version	SH	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,64)	TemplateSelectorSequence	SQ	0-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,66)	DefaultTemplate	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,68)	IsPreferred	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,6A)	TimepointInitialValueSequence	SQ	0-n
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,6C)	TimepointVariable	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5A)	TimepointValue	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5B)	SharingGroupSequence	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5C)	TemplateSelectorOperator	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,5D)	SharingType	CS	1
(0073,SIEMENS SYNGO LAYOUT PROTOCOL,FF)	VRT Preset	LO	1
(0029,SIEMENS SYNGO MODULES,51)	Incomplete Frame	CS	1
(0029,SIEMENS SYNGO MODULES,52)	Presentation UserData	UT	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,00)	syngo Graphic Object Sequence	SQ	1-n
(0071,SIEMENS SYNGO OBJECT GRAPHICS,01)	Fill Style Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,02)	Fill Background Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,03)	Fill Foreground Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,04)	Siemens Fill Mode	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,05)	Siemens Fill Pattern	OB	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,06)	Line Style Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,07)	Line Background Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,08)	Line Foreground Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,09)	Line Type	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,10)	Siemens Line Thickness	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,11)	Line Shadow X Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,12)	Line Shadow Y Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,13)	Siemens Shadow Style	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,14)	Shadow Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,15)	Stipple Pattern	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,16)	Line Anti Aliasing	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,17)	Line-Z-Blend Flag	CS	1

DICOM Tag	Name	VR	VM
(0071,SIEMENS SYNGO OBJECT GRAPHICS,18)	Text Style Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,19)	Text Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,1A)	Connection Line Width Selected	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,1B)	Connection Line Stipple Pattern	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,1C)	Connection Line Width	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,20)	Text Horizontal Align	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,21)	Text Vertical Align	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,22)	Text Shadow X Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,23)	Text Shadow Y Offset	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,24)	Text Shadow Style	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,25)	Text Shadow Color	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,26)	Text Log Font	CS	1-n
(0071,SIEMENS SYNGO OBJECT GRAPHICS,27)	Text-Z-Blend Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,28)	syngo Graphic Bit Mask	OB	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,29)	Visibility Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,30)	syngo Graphic Sensitivity	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,31)	syngo Graphic Pick Mode Type	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,32)	syngo Graphic Layer	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,33)	syngo Graphic Object Version	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,34)	syngo Graphic Coordinate System	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,35)	syngo Graphic Custom Attributes	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,36)	syngo Graphic Custom Attributes Key	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,37)	syngo Graphic Custom Attributes Value	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,38)	syngo Graphic View Name	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,39)	syngo Graphic Data	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,40)	syngo Graphic Type	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,41)	Number of syngo Graphic Points	US	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,42)	Axis Main Tick Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,43)	Axis Detail Tick Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,44)	Axis Main Tick Spacing	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,45)	Axis Detail Tick Spacing	DS	1-n
(0071,SIEMENS SYNGO OBJECT GRAPHICS,46)	Axis Main Tick Count	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,47)	Axis Detail Tick Count	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,48)	Axis Tick Behavior	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,49)	Axis Tick Alignment	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,50)	Axis Step	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,51)	Axis Step Index	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,52)	Axis Text Format	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,53)	Axis Show Center Text Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,54)	Axis Show Tick Text Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,55)	Bitmap X Orientation	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,56)	Bitmap Y Orientation	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,57)	syngo Graphic Blob	OB	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,58)	syngo Graphic Interpolation	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,59)	syngo Graphic Angle	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,60)	syngo Graphic Size	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,61)	Cut Line Side	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,62)	syngo Graphic Tip Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,63)	Cut Line Arrow Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,64)	Line Gap Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,65)	syngo Graphic Circle Radius	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,66)	Line Distance Move	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,67)	Line Marker Length	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,68)	syngo Graphic Center	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,69)	Range Center Area Top Left	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,70)	Range Center Area Bottom Right	DS	3

DICOM Tag	Name	VR	VM
(0071,SIEMENS SYNGO OBJECT GRAPHICS,71)	Range Tilt	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,72)	Range Minimum Tilt	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,73)	Range Maximum Tilt	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,74)	syngo Graphic Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,75)	Range Minimum Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,76)	Range Maximum Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,77)	syngo Graphic Height	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,78)	Range Feed	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,79)	Range Direction	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,80)	Range Show Scans	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,81)	Range Minimum Scan Distance	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,82)	Range Orthogonal Height	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,83)	syngo Graphic Position	DS	3
(0071,SIEMENS SYNGO OBJECT GRAPHICS,84)	syngo Graphic Closed Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,85)	Range Line Tip Mode	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,86)	syngo Graphic List Count	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,87)	Axis Flip Text Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,88)	Curve Diagram Type	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,89)	syngo Graphic Start Angle	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,90)	syngo Graphic End Angle	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,91)	Live Wire Smoothness	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,92)	Live Wire Spline Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,93)	Ellipse Circle Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,94)	syngo Graphic Square Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,95)	Curve Section Start Index	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,96)	Curve Section End Index	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,97)	Marker Alpha	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,98)	Table Row Count	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,99)	Table Column Count	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9A)	Table Row Height	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9B)	Table Column Width	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9C)	Rectangle Selection Segment Offset	IS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,9D)	syngo Graphic Text	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A0)	Axis Tick Spacing Coordinate System	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A1)	Axis Diagram Grid Type	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A2)	Polar Plot Circle Count	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A3)	Polar Plot Lines-per-Circle	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A4)	Polar Plot Compartment Count	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A5)	Polar Plot Radius Weight	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A6)	Circle Segment Outer Radius	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A7)	Circle Segment Clockwise Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A8)	Axis Diagram Auto Resize Flag	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,A9)	Axis Diagram Step Start	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B0)	Group Root	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B1)	Group Name	ST	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B2)	syngo Graphic Annotation Sequence	SQ	1-n
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B3)	Text Minimum Height	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B4)	Text Font Scaling Factor	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B5)	Text Maximum Extensions	SL	2
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B6)	Text Segment Size	CS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,B7)	Graphic Object Reference Label	SL	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,C4)	Show Grid	CS	1
(0029,SIEMENS SYNGO PRINT SERVICE,10)	Sheet Number	IS	1
(0071,SIEMENS SYNGO REGISTRATION,20)	Registered Image Sequence	SQ	1
(0071,SIEMENS SYNGO REGISTRATION,21)	Registration Is Validated Flag	CS	1
(0071,SIEMENS SYNGO REGISTRATION,22)	Deformable Registration Inverse Grid Sequence	SQ	1

DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO RWVM,50)	RWVM Version	LO	1
(0029,SIEMENS SYNGO SEGMENTATION,10)	Segmentation Inverted	CS	1
(0029,SIEMENS SYNGO SEGMENTATION,11)	Segmentation Uneditable by User	CS	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,12)	Surface Mesh Private Data	SQ	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,13)	Surface Mesh Private Data Task name	CS	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,14)	Surface Mesh Private Data Version Number	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,15)	Surface Mesh ImagePlane Sequence	SQ	0-N
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,16)	ImagePlane Sequence Identifier	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,17)	ImagePlane Sequence Identification Code Sequence	SQ	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,18)	ImagePlane Sequence Identification Code Value	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,19)	ImagePlane Sequence Identification Coding Scheme Designator	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,20)	ImagePlane Sequence Identification Code Meaning	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,21)	Surface Mesh ImagePlane	SQ	1-N
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,22)	ImagePlane	FL	9
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,23)	ImagePlane Type	CS	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,24)	ImagePlane Description	LO	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,25)	Surface Mesh Point List Sequence	SQ	0-N
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,26)	Point List Identifier	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,27)	Point List Identification Code Sequence	SQ	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,28)	Point List Identification Code Value	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,29)	Point List Identification Coding Scheme Designator	SH	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,30)	Point List Identification Code Meaning	LO	1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,31)	Point List Description	LO	0-1
(0029,SIEMENS SYNGO SEGMENTATION DICOM MESH PRIVATEDATA,32)	Point List	FL	1-N
(0031,SIEMENS SYNGO SOP CLASS PACKING,10)	SOP Class Packing Sequence	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,20)	Packing Version	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,21)	Packing Originator	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,30)	Original SOP Class UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,31)	Original Study Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,32)	Original Series Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,33)	Original SOP Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,34)	Original Transfer Syntax UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,40)	Attributes to Set to zero-length	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,41)	Attributes to Remove	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,50)	Original Rows	US	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,51)	Original Columns	US	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,58)	Original Image Type	CS	2-n

DICOM Tag	Name	VR	VM
(0031,SIEMENS SYNGO SOP CLASS PACKING,60)	Original Modality	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,70)	Sequence of original stream chunks	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,71)	Start tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,72)	End tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,73)	Stream chunk is a PAYLOAD	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,80)	Stream chunk	OB	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,10)	SOP Class Packing Sequence	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,20)	Packing Version	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,21)	Packing Originator	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,30)	Original SOP Class UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,31)	Original Study Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,32)	Original Series Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,33)	Original SOP Instance UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,34)	Original Transfer Syntax UID	UI	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,40)	Attributes to Set to zero-length	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,41)	Attributes to Remove	AT	1-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,50)	Original Rows	US	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,51)	Original Columns	US	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,58)	Original Image Type	CS	2-n
(0031,SIEMENS SYNGO SOP CLASS PACKING,60)	Original Modality	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,70)	Sequence of original stream chunks	SQ	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,71)	Start tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,72)	End tag of a stream chunk	AT	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,73)	Stream chunk is a PAYLOAD	CS	1
(0031,SIEMENS SYNGO SOP CLASS PACKING,80)	Stream chunk	OB	1
(0029,SIEMENS SYNGO TIME POINT SERVICE,01)	Time Point ID	LO	1
(0029,SIEMENS SYNGO TIME POINT SERVICE,02)	Time Point Information	LO	1
(0029,SIEMENS SYNGO TIME POINT SERVICE,50)	Studies in Time Point Sequence	SQ	1
(7FD1,SIEMENS SYNGO ULTRA-SOUND TOYON DATA STREAMING,01)	Padding	OB	1
(7FD1,SIEMENS SYNGO ULTRA-SOUND TOYON DATA STREAMING,09)	Version ID	OB	1
(7FD1,SIEMENS SYNGO ULTRA-SOUND TOYON DATA STREAMING,10)	Payload	LO	1
(7FD1,SIEMENS SYNGO ULTRA-SOUND TOYON DATA STREAMING,11)	After Payload	LO	1
(0029,SIEMENS SYNGO VOLUME,12)	Slices	US	1
(0029,SIEMENS SYNGO VOLUME,18)	Volume Level	IS	1
(0029,SIEMENS SYNGO VOLUME,30)	Voxel Spacing	DS	3
(0029,SIEMENS SYNGO VOLUME,32)	Volume Position (Patient)	DS	3
(0029,SIEMENS SYNGO VOLUME,37)	Volume Orientation (Patient)	DS	9
(0029,SIEMENS SYNGO VOLUME,40)	Resampling Flag	CS	1
(0029,SIEMENS SYNGO VOLUME,42)	Normalization Flag	CS	1
(0029,SIEMENS SYNGO VOLUME,44)	SubVolume Sequence	SQ	1-n
(0029,SIEMENS SYNGO VOLUME,46)	Histogram Number Of Bins UL	UL	1
(0029,SIEMENS SYNGO VOLUME,47)	Volume Histogram Data	OB	1
(0029,SIEMENS SYNGO VOLUME,48)	Volume Histogram BinBase	SL	1
(0029,SIEMENS SYNGO VOLUME,50)	Volume Version	LO	1
(0029,SIEMENS SYNGO VOLUME,60)	Total Frame Count Of Referenced Instance	IS	0-1
(0031,SIEMENS SYNGO WORKFLOW,10)	WF Internal Patient UID	UI	1
(0031,SIEMENS SYNGO WORKFLOW,11)	WF Patients Death Indicator	SH	1
(0031,SIEMENS SYNGO WORKFLOW,12)	WF Patients Death Date	DA	1
(0031,SIEMENS SYNGO WORKFLOW,13)	WF Patients Death Time	TM	1
(0031,SIEMENS SYNGO WORKFLOW,14)	WF VIP Indicator	SH	1
(0031,SIEMENS SYNGO WORKFLOW,15)	WF Emergency Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,16)	Source	US	1

DICOM Tag	Name	VR	VM
(0031,SIEMENS SYNGO WORKFLOW,20)	WF Internal Visit UID	SH	1
(0031,SIEMENS SYNGO WORKFLOW,25)	WF Internal ISR UID	SH	1
(0031,SIEMENS SYNGO WORKFLOW,32)	WF Control State	SH	1
(0031,SIEMENS SYNGO WORKFLOW,34)	WF Local Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,36)	WF Referenced Studies	UI	1-n
(0031,SIEMENS SYNGO WORKFLOW,40)	WF Workflow ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,41)	WF Workflow Description	LO	1
(0031,SIEMENS SYNGO WORKFLOW,42)	WF Workflow Control State	LO	1
(0031,SIEMENS SYNGO WORKFLOW,43)	WF Workflow Ad Hoc Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,44)	WF Hybrid Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,45)	WF Workflow Read State	LO	1
(0031,SIEMENS SYNGO WORKFLOW,50)	WF Workitem ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,51)	WF Workitem Name	LO	1
(0031,SIEMENS SYNGO WORKFLOW,52)	WF Workitem Type	LO	1
(0031,SIEMENS SYNGO WORKFLOW,53)	WF Workitem Roles	LO	1-n
(0031,SIEMENS SYNGO WORKFLOW,54)	WF Workitem Description	LO	1
(0031,SIEMENS SYNGO WORKFLOW,55)	WF Workitem Control State	LO	1
(0031,SIEMENS SYNGO WORKFLOW,56)	WF Claiming User	LO	1
(0031,SIEMENS SYNGO WORKFLOW,57)	WF Claiming Host	LO	1
(0031,SIEMENS SYNGO WORKFLOW,58)	WF Taskflow ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,59)	WF Taskflow Name	LO	1
(0031,SIEMENS SYNGO WORKFLOW,5A)	WF Failed Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,5B)	WF Scheduled Time	DT	1
(0031,SIEMENS SYNGO WORKFLOW,5C)	WF Workitem Ad Hoc Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,5D)	WF Patient Update Pending Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,5E)	WF Patient Mixup Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,60)	WF Client ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,61)	WF Template ID	LO	1
(0031,SIEMENS SYNGO WORKFLOW,70)	WF E-mail	LO	1
(0031,SIEMENS SYNGO WORKFLOW,81)	WF Institution Name	LO	1
(0031,SIEMENS SYNGO WORKFLOW,82)	WF Institution Address	ST	1
(0031,SIEMENS SYNGO WORKFLOW,83)	WF Institution Code Sequence	SQ	1
(0031,SIEMENS SYNGO WORKFLOW,90)	WF Issuer of Master Patient ID	UI	1
(0031,SIEMENS SYNGO WORKFLOW,A0)	Patient History Sequence	SQ	1-n
(0031,SIEMENS SYNGO WORKFLOW,A1)	Procedure Marked Deleted Flag	US	1
(0031,SIEMENS SYNGO WORKFLOW,A2)	ContextfolderId	LT	1
(0031,SIEMENS SYNGO WORKFLOW,A3)	Visible DataRoles	UT	1
(0031,SIEMENS SYNGO WORKFLOW,A4)	Preloaded	US	1
(0031,SIEMENS SYNGO WORKFLOW,A5)	TaskflowTechnology	SL	1
(0031,SIEMENS SYNGO WORKFLOW,A6)	WfWorkflowType	SH	1
(0031,SIEMENS SYNGO WORKFLOW,A7)	NumberOfRequestedProcedures	SL	1
(0031,SIEMENS SYNGO WORKFLOW,A8)	External Master Patient ID	LT	1
(0031,SIEMENS SYNGO WORKFLOW,A9)	Not To Be Archived	US	1
(0031,SIEMENS SYNGO WORKFLOW,B0)	WorklistItemChecksum	ST	1
(0019,SIEMENS MED NM,93)	Phase start time	SL	1-n
(0019,SIEMENS MED NM,A1)	Number of Phases	SS	1
(0019,SIEMENS MED NM,A5)	Number of repeats / phase	SS	1-n
(0019,SIEMENS MED NM,A6)	Cycles Per Repeat	SS	1-n
(0019,SIEMENS MED NM,A7)	Repeat Start time	SL	1-n
(0019,SIEMENS MED NM,A8)	Repeat Stop time	SL	1-n
(0019,SIEMENS MED NM,A9)	Effective Repeat Time	SL	1-n
(0019,SIEMENS MED NM,AA)	Acquired Cycles Per Repeat	SS	1-n
(0033,SIEMENS MED NM,28)	Number point sources used for NCO and MHR Calibrations	SL	1
(0033,SIEMENS MED NM,29)	Crystal thickness	FL	n
(0033,SIEMENS MED NM,30)	Preset Name Used for Acquisition	LO	1

DICOM Tag	Name	VR	VM
(0033,SIEMENS MED NM,31)	Camera Configuration Angle	FL	1
(0033,SIEMENS MED NM,38)	Pixel Scale factor	FL	1
(0035,SIEMENS MED NM,00)	Specialized TOMO Type	LO	1
(0035,SIEMENS MED NM,04)	Repeat ID	SS	1
(0035,SIEMENS MED NM,05)	Phase ID	SS	1
(0041,SIEMENS MED NM,01)	Whole Body Tomo Position Index	SL	1
(0041,SIEMENS MED NM,02)	Whole Body Tomo Number of Positions	SL	1
(0041,SIEMENS MED NM,10)	Effective Emission Energy	FL	1
(0043,SIEMENS MED NM,02)	FOV Transformation Matrix	FD	16
(0045,SIEMENS MED NM,05)	Total Counts	SL	1
(0045,SIEMENS MED NM,21)	Collimator Type ID	US	1-n
(0045,SIEMENS MED NM,22)	Point Source Number	US	1
(0045,SIEMENS MED NM,23)	Calibration Type	LO	1
(0055,SIEMENS MED NM,7E)	Collimator Thickness	FL	1-n
(0055,SIEMENS MED NM,7F)	Collimator Angular Resolution	FL	1-n
(0055,SIEMENS MED NM,C0)	Useful Field of View	SS	1-n
(0057,SIEMENS MED NM,03)	NM Pixel Units	LO	1
(0061,SIEMENS MED NM,5F)	Crystal Intrinsic Resolution	FL	1-n
(0061,SIEMENS MED NM,62)	Recon Output Type	LT	1
(0061,SIEMENS MED NM,70)	NM Reconstruction Algorithm	LT	1
(0061,SIEMENS MED NM,8D)	QSPECT Flag	SS	1
(0063,SIEMENS MED NM,0C)	xSpect Quant Source Labels	LO	1-n
(0063,SIEMENS MED NM,80)	Assay Dose List	FL	1-n
(0063,SIEMENS MED NM,81)	Assay Dose Date Time List	DT	1-n
(0065,SIEMENS MED NM,01)	Original Detector Index	SS	1
(0065,SIEMENS MED NM,02)	Siemens Planar Data Organization	LO	1
(7FE3,SIEMENS MED NM,14)	Minimum pixel value in frame	OW	n
(7FE3,SIEMENS MED NM,15)	Maximum pixel value in frame	OW	n
(7FE3,SIEMENS MED NM,29)	Number of Rwaves in a frame	OW	n
(0067,SIEMENS MED MI,01)	MI Scan ID	LT	1
(0067,SIEMENS MED MI,02)	Scanner Console Generation	LO	1
(0067,SIEMENS MED MI,03)	Recon Parameters	OB	1
(0067,SIEMENS MED MI,04)	Group Reconstruction ID	LO	1
(0067,SIEMENS MED MI,05)	Device IVK	ST	1
(0067,SIEMENS MED MI,14)	Raw Data Description	LO	1
(0067,SIEMENS MED MI,16)	Raw Data Series instance UIDs	UI	1
(0067,SIEMENS MED MI,17)	Raw Data Referenced Series instance UIDs	UI	1
(0067,SIEMENS MED MI,18)	Raw Data Blob Sequence	SQ	1
(0067,SIEMENS MED MI,19)	>Raw Data Blob Sequence Element	OB	1
(0071,SIEMENS MED PT,22)	Decay Correction DateTime	DT	1
(0019, SIEMENS SMS-AX IAE,00)	Bookmark XML Structure	OB	1

Interpretation of the DICOM Tags from the above table:

(gggg, pp,ee) -> (gggg, ppee)

gggg - odd group number

pp - private creator identification code

ee - private element

9.2.1 Usage of Attributes from received IODs

N/A

9.2.2 Attribute mapping

Reference IOD tables in section 9.1, where mapped attributes are tagged if received from DICOM Modality Worklist.

9.2.3 Coerced / Modified fields

N/A

9.3 Coded Terminology and Templates

9.3.1 Context Groups

N/A

9.3.2 Template Specifications

Creates and stores, upon completion of the procedure step, a DICOM CT Radiation Dose SR object. The CT Radiation Dose SR uses template TID 10011.

9.3.2.1 CT Radiation Dose SR

Table 159: CT Radiation Dose

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	X-Ray Radiation Dose Report	1	ALWAYS	Root node
>	HAS CONCEPT MOD	CODE	Procedure reported	1	ALWAYS	Computed Tomography X-Ray
>>	HAS CONCEPT MOD	CODE	Has Intent	1	ALWAYS	Diagnostic Intent
>		INCLUDE	Observer Context	1-n	ALWAYS	
>	HAS OBS CONTEXT	DATETIME	Start of X-Ray Irradiation	1	ALWAYS	First Acquisition Date/Time in study
>	HAS OBS CONTEXT	DATETIME	End of X-Ray Irradiation	1	ALWAYS	Last Acquisition Date/Time in study
>	HAS OBS CONTEXT	CODE	Scope of Accumulation	1	ALWAYS	Study
>>	HAS PROPERTIES	UIDREF	UID Types	1	ALWAYS	Study Instance UID (0020,000D)
>	CONTAINS	INCLUDE	CT Accumulated Dose Data	1	ALWAYS	
>	CONTAINS	INCLUDE	CT Irradiation Event Data	1-n	ALWAYS	

Table 160: Observer Context

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	X-Ray Radiation Dose Report	1	ALWAYS	Root node
>	HAS OBS CONTEXT	CODE	Observer Type	1	ALWAYS	Device
>	HAS OBS CONTEXT	UIDREF	Device Observer UID	1	ALWAYS	
>	HAS OBS CONTEXT	TEXT	Device Observer Name	1	ALWAYS	Name of syngo Acquisition Workplace
>	HAS OBS CONTEXT	TEXT	Device Observer Manufacturer	1	ALWAYS	Siemens Healthineers
>	HAS OBS CONTEXT	TEXT	Device Observer Model Name	1	ALWAYS	Scanner model
>	HAS OBS CONTEXT	TEXT	Device Observer Serial Number	1	ALWAYS	999999
>	HAS OBS CONTEXT	TEXT	Device Observer Physical Location During Observation	1	ALWAYS	-

Table 161: CT Accumulated Dose Data

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	CT Accumulated Dose Data	1	ALWAYS	
>	CONTAINS	NUM	Total Number of Irradiation Events	1	ALWAYS	
>	CONTAINS	NUM	CT Dose Length Product Total	1	ALWAYS	

Table 162: CT Irradiation Event Data

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	CT Acquisition	1	ALWAYS	
>	CONTAINS	TEXT	Acquisition Protocol	1	ALWAYS	Name of the Range
>	CONTAINS	CODE	Target Region	1	ALWAYS	Body Part Examined
>	CONTAINS	CODE	CT Acquisition Type	1	ALWAYS	
>	CONTAINS	CODE	Procedure Context	1	ALWAYS	
>	CONTAINS	UIDREF	Irradiation Event UID	1	ALWAYS	
>	CONTAINS	CONTAINER	CT Acquisition Parameters	1	ALWAYS	
>>	CONTAINS	NUM	Exposure Time	1	ALWAYS	
>>	CONTAINS	INCLUDE	Scanning Length	1	ALWAYS	
>>	CONTAINS	NUM	Nominal Single Collimation Width	1	ALWAYS	
>>	CONTAINS	NUM	Nominal Total Collimation Width	1	ALWAYS	
>>	CONTAINS	NUM	Pitch Factor	1	VNAP	

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
>>	CONTAINS	NUM	Number of X-Ray Sources	1	ALWAYS	
>>	CONTAINS	CONTAINER	CT X-Ray Source Parameters	1-n	ALWAYS	
>>>	CONTAINS	TEXT	Identification of the X-Ray Source	1	ALWAYS	
>>>	CONTAINS	NUM	KVP	1	ALWAYS	
>>>	CONTAINS	NUM	Maximum X-Ray Tube Current	1	ALWAYS	
>>>	CONTAINS	NUM	X-Ray Tube Current	1	ALWAYS	
>>>	CONTAINS	NUM	Exposure Time per Rotation	1	VNAP	
>	CONTAINS	CONTAINER	CT Dose	1	VNAP	
>>	CONTAINS	NUM	Mean CTDIvol	1	ALWAYS	
>>	CONTAINS	CODE	CTDIw Phantom Type	1	ALWAYS	
>>	CONTAINS	NUM	DLP	1	ALWAYS	
>>	CONTAINS	NUM	Size Specific Dose Estimate	1	ALWAYS	Only if Dose is not 0
>>>	HAS CONCEPT MOD	CODE	Measurement Method	1-N	ALWAYS	Arithmetic Average of SSDE(z)
>>>	CONTAINS	NUM	Water Equivalent Diameter	1	ALWAYS	
>>> >	HAS CONCEPT MOD	CODE	Measurement Method	1	ALWAYS	Water Equivalent Diameter From Localizer
>>>	INFERRED FROM	NUM	Size Specific Dose Estimate At Longitudinal Position z	1-n	ALWAYS	
>>> >	INFERRED FROM	NUM	Longitudinal Position Z	1	ALWAYS	
>>>	INFERRED FROM	NUM	Water Equivalent Diameter At Longitudinal Position Z	1	ALWAYS	

Table 163: CT Dose Check Details

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CONTAINER	Dose Check Alert Details	1	VNAP	Only if Dose Alert is configured
>	CONTAINS	CODE	DLP Alert Value Configured	1	ALWAYS	
>	CONTAINS	CODE	CTDIvol Alert Value Configured	1	ALWAYS	
>	CONTAINS	NUM	DLP Alert Value	1	ALWAYS	
>	CONTAINS	NUM	CTDIvol Alert Value	1	ALWAYS	

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
>	CONTAINS	NUM	Accumulated DLP Forward Estimate	1	ALWAYS	
>	CONTAINS	NUM	Accumulated CTDIvol Forward Estimate	1	ALWAYS	
>	CONTAINS	TEXT	Reason for Proceeding	1	ALWAYS	
>	CONTAINS	INCLUDE	Person Participant	1	ALWAYS	
		CONTAINER	Dose Check Notification Details	1	VNAP	Only if Dose Notification is configured
>	CONTAINS	CODE	DLP Notification Value Configured	1	ALWAYS	
>	CONTAINS	CODE	CTDIvol Notification Value Configured	1	ALWAYS	
>	CONTAINS	NUM	DLP Notification Value	1	ALWAYS	
>	CONTAINS	NUM	CTDIvol Notification Value	1	ALWAYS	
>	CONTAINS	NUM	DLP Forward Estimate	1	ALWAYS	
>	CONTAINS	NUM	CTDIvol Forward Estimate	1	ALWAYS	
>	CONTAINS	TEXT	Reason for Proceeding	1	ALWAYS	
>	CONTAINS	INCLUDE	Person Participant	1	ALWAYS	

Table 164: Device Participant

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value
		CODE	Device Role in Procedure	1	ALWAYS	
>	HAS PROPERTIES	TEXT	Device Manufacturer	1	ALWAYS	
>	HAS PROPERTIES	TEXT	Device Model Name	1	ALWAYS	
>	HAS PROPERTIES	TEXT	Device Serial Number	1	ALWAYS	
>	HAS PROPERTIES	UIDREF	Device Observer UID	1	ALWAYS	

9.3.2.2 ExaminationSR

Table 165: Examination Report

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value Set Constraint
		CONTAINER	EV(1, 99CT_SOMX, "CT Examination Report")	1	ALWAYS	
>	CONTAINS	CONTAINER	EV(2, 99CT_SOMX, "CT Acquisition Report")	1	ALWAYS	
>>	CONTAINS	NUM	EV(100, 99CT_SOMX, "Total mAs")	1	ALWAYS	UNITS = EV (mAs, UCUM, "mAs")
>>	CONTAINS	TEXT	EV(102, 99CT_SOMX, "Performing Physician Name")	1	ALWAYS	
>>	CONTAINS	TEXT	EV(103, 99CT_SOMX, "Operators Name")	1	ALWAYS	
>>	CONTAINS	NUM	EV(113813, DCM, "CT Dose Length Product Total")	1	ALWAYS	UNITS = EV (mGy.cm, UCUM, "mGy.cm")
>>	CONTAINS	CONTAINER	EV(600, 99CT_SOMX, "Patient Position Attributes")	1-n	ALWAYS	
>>>	CONTAINS	TEXT	EV(601, 99CT_SOMX, "Patient Position")	1	ALWAYS	
>>>	CONTAINS	TEXT	EV(602, 99CT_SOMX, "Frame of reference id")	1	ALWAYS	
>>	CONTAINS	CONTAINER	EV(550, 99CT_SOMX, "Contrast Phase")	1-n	ANAP	
>>>	CONTAINS	TEXT	EV(121145, DCM, "Description of Material")	1	ALWAYS	
>>>	CONTAINS	NUM	EV(122091, DCM, "Volume administered")	1	ALWAYS	UNITS = EV (ml, UCUM, "ml")
>>>	CONTAINS	NUM	EV(122093, DCM, "Concentration")	1	ALWAYS	UNITS = EV (mg/ml, UCUM, "mg/ml")
>>>	CONTAINS	NUM	EV(122094, DCM, "Rate of administration")	1	ALWAYS	
>>>	CONTAINS	NUM	EV(300, 99CT_SOMX, "CM Ratio")	1	ALWAYS	UNITS = EV (% , UCUM, "%")
>>>	CONTAINS	TEXT	EV (123011, DCM, "" Contrast/Bolus Agent)	1	ALWAYS	
>>	CONTAINS	CONTAINER	EV(113819, DCM, "CT Acquisition")	1	ALWAYS	
>>>	CONTAINS	TEXT	EV(101, 99CT_SOMX, "Range Name")	1-n	ALWAYS	
>>>	CONTAINS	CONTAINER	EV(4, 99CT_SOMX, "Decision Tree")	1	ALWAYS	
>>>>	CONTAINS	TEXT	EV(803, 99CT_SOMX, "Comment")	1	ANAP	"No decision tree selected"
>>>>	CONTAINS	CONTAINER	EV(5, 99CT_SOMX, "User")	1	ANAP	
>>>>	CONTAINS	CONTAINER	EV(800, 99CT_SOMX, "Attribute")	1-n	ALWAYS	
	CONTAINS	TEXT	EV(801, 99CT_SOMX, "Question")	1	ALWAYS	

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value Set Constraint
>>>>> >	CONTAINS	TEXT	EV(802, 99CT_SOMX, "Answer"	1	ALWAYS	
>>>>	CONTAINS	CONTAINER	EV(6, 99CT_SOMX, "System"	1	ANAP	
>>>>>	CONTAINS	CONTAINER	EV(800, 99CT_SOMX, "Attribute"	1-n	ALWAYS	
>>>>> >	CONTAINS	TEXT	EV(801, 99CT_SOMX, "Question"	1	ALWAYS	
>>>>> >	CONTAINS	TEXT	EV(802, 99CT_SOMX, "Answer"	1	ALWAYS	
>>>	CONTAINS	CONTAINER	EV(113822, DCM, "CT Acquisition Parameters")	1-n	ALWAYS	
>>>>	CONTAINS	NUM	EV(113824, DCM, "Exposure Time")	1	ALWAYS	UNITS = EV (s, UCUM, "s")
>>>>	CONTAINS	NUM	EV(113826, DCM, "Nominal Single Collimation Width")	1	ALWAYS	UNITS = EV (mm, UCUM, "mm")
>>>>	CONTAINS	NUM	EV(204, 99CT_SOMX, "Quality Reference mAs")	1		UNITS = EV (mAs, UCUM, "mAs")
>>>>	CONTAINS	NUM	EV(205, 99CT_SOMX, "Quality Reference mAs Low")	1		UNITS = EV (mAs, UCUM, "mAs")
>>>>	CONTAINS	NUM	EV(206, 99CT_SOMX, "Quality Reference mAs High")	1		UNITS = EV (mAs, UCUM, "mAs")
>>>>	CONTAINS	NUM	EV(207, 99CT_SOMX, "Effective mAs")	1-n		UNITS = EV (mAs, UCUM, "mAs")
>>>>	CONTAINS	NUM	EV(208, 99CT_SOMX, "Effective mAs Low")	1-n		UNITS = EV (mAs, UCUM, "mAs")
>>>>	CONTAINS	NUM	EV(209, 99CT_SOMX, "Effective mAs High")	1-n		UNITS = EV (mAs, UCUM, "mAs")
>>>>	CONTAINS	NUM	EV(113830, DCM, "Mean CTDIvol")	1	ALWAYS	UNITS = EV (mGy, UCUM, "mGy")
>>>>	CONTAINS	TEXT	EV(113835, DCM, "CTDIw Phantom Type")	1	ALWAYS	
>>>>	CONTAINS	NUM	EV(113838, DCM, "DLP")	1	ALWAYS	UNITS = EV (mGy.cm, UCUM, "mGy.cm")
>>>>	CONTAINS	NUM	EV(113930, DCM, "Size Specific Dose Estimate")	1		UNITS = EV (mGy, UCUM, "mGy")
>>>>	CONTAINS	NUM	EV(113980, DCM, "Water Equivalent Diameter")	1		UNITS = EV (cm, UCUM, "cm")
>>>>	CONTAINS	NUM	EV(113812, DCM, "Total Number of Irradiation events")	1	ALWAYS	UNITS = EV ({events}, UCUM, "events")
>>>>	CONTAINER	CONTAINER	EV(113831, DCM, "CT X-Ray Source Parameters")	1-n	ALWAYS	
>>>>>	CONTAINS	NUM	EV (113733, DCM, "KVP")	1	ALWAYS	UNITS = EV (kV, UCUM, "kV")
>>>>>	CONTAINS	NUM	EV (113734, DCM, "X-Ray Tube Current")	1	ANAP	UNITS = EV (mA, UCUM, "mA")
>>>>>	CONTAINS	NUM	EV (113736, DCM, "Exposure")	1	ANAP	UNITS = EV (mAs, UCUM, "mAs")

NL	Rel with Parent	VT	Concept Name	VM	Presence of Value	Value Set Constraint
>>>>>	CONTAINS	NUM	EV(200, 99CT_SOMX, "Effective Exposure")	1	ANAP	UNITS = EV (mAs, UCUM, "mAs")
>>>>>	CONTAINS	TEXT	EV(113832, DCM, "Identification of the X-Ray Source")	1	ALWAYS	
>>>>>	CONTAINS	TEXT	EV(201, 99CT_SOMX, "Tin Filter")	1	ALWAYS	
>>>>>	CONTAINS	TEXT	EV(202, 99CT_SOMX, "Tube Type")	1	ALWAYS	A, B
>>>>>	CONTAINS	TEXT	EV(202, 99CT_SOMX, "Additional Letter")	1	ALWAYS	
>>>>>	CONTAINS	TEXT	EV(203, 99CT_SOMX, "Scan Number")	1	ALWAYS	
>>>>>	CONTAINS	NUM	EV(113826, DCM, "Nominal Single Collimation Width")	1	ALWAYS	UNITS = EV (mm, UCUM, "mm")
>>>>>	CONTAINS	TEXT	EV(106, DCM, "X-Ray Filter Material")	1	ALWAYS	None, Tin, GoldTin, Gold
>>>>	CONTAINS	NUM	EV(107, 99CT_SOMX, "Effective Bolus Trigger Level")	1	ANAP	UNITS = EV (HU, UCUM, "HU")
>>>>	CONTAINS	NUM	EV(108, 99CT_SOMX, "Reference Bolus Trigger Level")	1	ANAP	UNITS = EV (HU, UCUM, "HU")
>>>>	CONTAINS	NUM	EV(109, 99CT_SOMX, "Intended Bolus Trigger Level")	1	ANAP	UNITS = EV (HU, UCUM, "HU")
>>>>	CONTAINS	CONTAINER	EV(110, 99CT_SOMX, "Enabled exposure pattern")	1	ANAP	
>>>>>	CONTAINS	TEXT	EV(111, 99CT_SOMX, "") Index	1-n	ANAP	

9.3.3 Private Code definitions

Table 166: Private Code definitions

Code Value	Code Meaning	Definition	Notes
1	CT Examination Report	Report for one CT examination	
2	CT Acquisition Report	Report for one CT acquisition	
3	Scanprotocols	Section for scan protocols within an CT examination	
100	Total mAs	Total mAs applied during one CT examination	
101	Range Name	Name of the range within a CT acquisition	
102	Performing Physicians Name	Name of the performing physician of a CT examination	
103	Operators Name	Name of the operator of a CT examination	
300	CM Ratio	Ratio of the contrast medium	
500	Contrast	Section for contrast application	
550	Contrast Phase	Contrast phase indicator	
600	Patient Position Attributes	Section for patient positions	

Code Value	Code Meaning	Definition	Notes
601	Patient Position	Patient position within a Frame of Reference	
602	Frame of reference id	Unique identifier for a Frame of Reference	

Note: **SPECTsyngo** contains additional private code definitions with coding scheme designator of 99NMG.

9.4 Grayscale Image Consistency

The high resolution TFT display monitor option of **SPECTsyngo** comes with a DICOM Grayscale Standard Display Function (GSDF) compliant factory pre-setting. A typical working environment setup is assumed for ambient light.

9.5 Standard Extended / Specialized / Private SOP Classes

9.5.1 Standard Extension of SOP Classes

SPECTsyngo has extended standard SOP classes with additional attributes, which are described in the tables in sections 9.1.7, 9.1.8, 9.2.

9.6 Private Transfer Syntaxes

No private Transfer Syntaxes are defined for or requested by **SPECTsyngo** DICOM application.

9.7 DICOM Print SCU – detailed status displays

The following tables document the behavior of the **SPECTsyngo** DICOM Print AE in response to messages received for the printer SOP class and the print job SOP class.

Definitions of camera symbols:

- **Idle:** Camera is installed and ready; idle icon is displayed.
- **Interact:** The user has to react in near future, but not immediately.
Example: A camera was low in 8x10 clear sheets: LOW 8x10 CLR was sent by N-EVENT-REPORT.
- **Queue Stopped:** The user has to react immediately. Either the camera needs immediate interaction or a job has been aborted.
Example: A camera is out of 8x10 clear sheets, or camera is down, or a film job is aborted.

Note: different camera symbols are displayed according to the Printer Status Info.

9.7.1 Common Status Information

Table 167: Common Printer Status Information

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
NORMAL	Camera is ready	Camera is ready	<None>/idle
BAD RECEIVE MGZ	There is a problem with the film receive magazine. Films from the printer cannot be transported into the magazine.	Problem with receive magazine.	<None>/interact
BAD SUPPLY MGZ	There is a problem with the film supply magazine. Films from this magazine cannot be transported into the printer.	Problem with supply magazine.	<None>/interact
CALIBRATING	Printer is performing self calibration, it is expected to be available for normal operation shortly.	Self calibration. Please wait.	<None>/idle
CALIBRATION ERR	An error in the printer calibration has been detected, quality of processed films may not be optimal.	Problem in calibration. Film quality may not be optimal.	<None>/interact
CHECK CHEMISTRY	A problem with the processor chemicals has been detected, quality of processed films may not be optimal.	Problem with chemistry. Film quality may not be optimal.	<None>/interact
CHECK SORTER	There is an error in the film sorter	Error in film sorter.	<None>/interact
CHEMICALS EMPTY	There are no processing chemicals in the processor, films will not be printed and processed until the processor is back to normal.	Camera chemistry empty. Please check.	<None>/interact
CHEMICALS LOW	The chemical level in the processor is low, if not corrected, it will probably shut down soon.	Camera chemistry low. Please check.	<None>/interact
COVER OPEN	One or more printer or processor covers, drawers, doors are open.	Camera cover, drawer or door open.	<None>/interact

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
ELEC CONFIG ERR	Printer configured improperly for this job.	Camera configured improperly for this job. Queue stopped.	Queue for this camera will be STOPPED/ Queue stopped
ELEC DOWN	Printer is not operating due to some unspecified electrical hardware problem.	Camera electrical hardware Problem.	<None>/interact
ELEC SW ERROR	Printer not operating for some unspecified software error.	Camera software problem. Queue stopped.	Queue for this camera will be STOPPED/ Queue stopped
EMPTY 8X10	The 8x10 inch film supply magazine is empty.	8x10 film supply empty.	<None>/interact
EMPTY 8X10 BLUE	The 8x10 inch blue film supply magazine is empty.	8x10 blue film supply empty.	<None>/interact
EMPTY 8X10 CLR	The 8x10 inch clear film supply magazine is empty.	8x10 clear film supply empty.	<None>/interact
EMPTY 8X10 PAPER	The 8x10 inch paper supply magazine is empty.	8x10 paper supply empty.	<None>/interact
EMPTY 10X12	The 10x12 inch film supply magazine is empty.	10x12 film supply empty.	<None>/interact
EMPTY 10X12 BLUE	The 10x12 inch blue film supply magazine is empty.	10x12 blue film supply empty.	<None>/interact
EMPTY 10X12 CLR	The 10x12 inch clear film supply magazine is empty.	10x12 clear film supply empty.	<None>/interact
EMPTY 10X12 PAPER	The 10x12 inch paper supply magazine is empty.	10x12 paper supply empty.	<None>/interact
EMPTY 10X14	The 10x14 inch film supply magazine is empty.	10x14 film supply empty.	<None>/interact
EMPTY 10X14 BLUE	The 10x14 inch blue film supply magazine is empty.	10x14 blue film supply empty.	<None>/interact
EMPTY 10X14 CLR	The 10x14 inch clear film supply magazine is empty.	10x14 clear film supply empty.	<None>/interact
EMPTY 10X14 PAPER	The 10x14 inch paper supply magazine is empty.	10x14 paper supply empty.	<None>/interact
EMPTY 11X14	The 11x14 inch film supply magazine is empty.	11x14 film supply empty.	<None>/interact
EMPTY 11X14 BLUE	The 11x14 inch blue film supply magazine is empty.	11x14 blue film supply empty.	<None>/interact
EMPTY 11X14 CLR	The 11x14 inch clear film supply magazine is empty.	11x14 clear film supply empty.	<None>/interact
EMPTY 11X14 PAPER	The 11x14 inch paper supply magazine is empty.	11x14 paper supply empty.	<None>/interact
EMPTY 14X14	The 14x14 inch film supply magazine is empty.	14x14 film supply empty.	<None>/interact
EMPTY 14X14 BLUE	The 14x14 inch blue film supply magazine is empty.	14x14 blue film supply empty.	<None>/interact
EMPTY 14X14 CLR	The 14x14 inch clear film supply magazine is empty.	14x14 clear film supply empty.	<None>/interact
EMPTY 14X14 PAPER	The 14x14 inch paper supply magazine is empty.	14x14 paper supply empty.	<None>/interact

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
EMPTY 14X17	The 14x17 inch film supply magazine is empty.	14x17 film supply empty.	<None>/interact
EMPTY 14X17 BLUE	The 14x17 inch blue film supply magazine is empty.	14x17 blue film supply empty.	<None>/interact
EMPTY 14X17 CLR	The 14x17 inch clear film supply magazine is empty.	14x17 clear film supply empty.	<None>/interact
EMPTY 14X17 PAPR	The 14x17 inch paper supply magazine is empty.	14x17 paper supply empty.	<None>/interact
EMPTY 24X24	The 24x24 inch film supply magazine is empty.	24x24 film supply empty.	<None>/interact
EMPTY 24X24 BLUE	The 24x24 inch blue film supply magazine is empty.	24x24 blue film supply empty.	<None>/interact
EMPTY 24X24 CLR	The 24x24 inch clear film supply magazine is empty.	24x24 clear film supply empty.	<None>/interact
EMPTY 24X24 PAPR	The 24x24 inch paper supply magazine is empty.	24x24 paper supply empty.	<None>/interact
EMPTY 24X30	The 24x30 inch film supply magazine is empty.	24x30 film supply empty.	<None>/interact
EMPTY 24X30 BLUE	The 24x30 inch blue film supply magazine is empty.	24x30 blue film supply empty.	<None>/interact
EMPTY 24X30 CLR	The 24x30 inch clear film supply magazine is empty.	24x30 clear film supply empty.	<None>/interact
EMPTY 24X30 PAPR	The 24x30 inch paper supply magazine is empty.	24x30 paper supply empty.	<None>/interact
EMPTY A4 PAPR	The A4 paper supply magazine is empty.	A4 paper supply empty.	<None>/interact
EMPTY A4 TRANS	The A4 transparency supply magazine is empty.	A4 transparency supply empty.	<None>/interact
EXPOSURE FAILURE	The exposure device has failed due to some unspecified reason.	Exposure device has failed.	<None>/interact
FILM JAM	A film transport error has occurred, and a film is jammed in the printer or processor.	Film jam.	<None>/interact
FILM TRANSP ERR	There is a malfunction with the film transport, there may or may not be a film jam.	Film transport problem.	<None>/interact
FINISHER EMPTY	The finisher is empty.	Finisher is empty.	<None>/interact
FINISHER ERROR	The finisher is not operating due to some unspecified reason.	Finisher problem.	<None>/interact
FINISHER LOW	The finisher is low on supplies.	Finisher low.	<None>/interact
LOW 8X10	The 8x10 inch film supply magazine is low.	8x10 film supply low.	<None>/interact
LOW 8X10 BLUE	The 8x10 inch blue film supply magazine is low.	8x10 blue film supply low.	<None>/interact
LOW 8X10 CLR	The 8x10 inch clear film supply magazine is low.	8x10 clear film supply low.	<None>/interact
LOW 8X10 PAPR	The 8x10 inch paper supply magazine is low.	8x10 paper supply low.	<None>/interact
LOW 10X12	The 10x12 inch film supply magazine is low.	10x12 film supply low.	<None>/interact

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
LOW 10X12 BLUE	The 10x12 inch blue film supply magazine is low.	10x12 blue film supply low.	<None>/interact
LOW 10X12 CLR	The 10x12 inch clear film supply magazine is low.	10x12 clear film supply low.	<None>/interact
LOW 10X12 PAPR	The 10x12 inch paper supply magazine is low.	10x12 paper supply low.	<None>/interact
LOW 10X14	The 10x14 inch film supply magazine is low.	10x14 film supply low.	<None>/interact
LOW 10X14 BLUE	The 10x14 inch blue film supply magazine is low.	10x14 blue film supply low.	<None>/interact
LOW 10X14 CLR	The 10x14 inch clear film supply magazine is low.	10x14 clear film supply low.	<None>/interact
LOW 10X14 PAPR	The 10x14 inch paper supply magazine is low.	10x14 paper supply low.	<None>/interact
LOW 11X14	The 11x14 inch film supply magazine is low.	11x14 film supply low.	<None>/interact
LOW 11X14 BLUE	The 11x14 inch blue film supply magazine is low.	11x14 blue film supply low.	<None>/interact
LOW 11X14 CLR	The 11x14 inch clear film supply magazine is low.	11x14 clear film supply low.	<None>/interact
LOW 11X14 PAPR	The 11x14 inch paper supply magazine is low.	11x14 paper supply low.	<None>/interact
LOW 14X14	The 14x14 inch film supply magazine is low.	14x14 film supply low.	<None>/interact
LOW 14X14 BLUE	The 14x14 inch blue film supply magazine is low.	14x14 blue film supply low.	<None>/interact
LOW 14X14 CLR	The 14x14 inch clear film supply magazine is low.	14x14 clear film supply low.	<None>/interact
LOW 14X14 PAPR	The 14x14 inch paper supply magazine is low.	14x14 paper supply low.	<None>/interact
LOW 14X17	The 14x17 inch film supply magazine is low.	14x17 film supply low.	<None>/interact
LOW 14X17 BLUE	The 14x17 inch blue film supply magazine is low.	14x17 blue film supply low.	<None>/interact
LOW 14X17 CLR	The 14x17 inch clear film supply magazine is low.	14x17 clear film supply low.	<None>/interact
LOW 14X17 PAPR	The 14x17 inch paper supply magazine is low.	14x17 paper supply low.	<None>/interact
LOW 24X24	The 24x24 inch film supply magazine is low.	24x24 film supply low.	<None>/interact
LOW 24X24 BLUE	The 24x24 inch blue film supply magazine is low.	24x24 blue film supply low.	<None>/interact
LOW 24X24 CLR	The 24x24 inch clear film supply magazine is low.	24x24 clear film supply low.	<None>/interact
LOW 24X24 PAPR	The 24x24 inch paper supply magazine is low.	24x24 paper supply low.	<None>/interact
LOW 24X30	The 24x30 inch film supply magazine is low.	24x30 film supply low.	<None>/interact
LOW 24X30 BLUE	The 24x30 inch blue film supply magazine is low.	24x30 blue film supply low.	<None>/interact

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
LOW 24X30 CLR	The 24x30 inch clear film supply magazine is low.	24x30 clear film supply low.	<None>/interact
LOW 24X30 PAPR	The 24x30 inch paper supply magazine is low.	24x30 paper supply low.	<None>/interact
LOW A4 PAPR	The A4 paper supply magazine is low.	A4 paper supply low.	<None>/interact
LOW A4 TRANS	The A4 transparency supply magazine is low.	A4 transparency supply low.	<None>/interact
NO RECEIVE MGZ	The film receive magazine is not available.	Film receiver not available.	<None>/interact
NO RIBBON	The ribbon cartridge needs to be replaced.	Replace ribbon cartridge.	<None>/interact
NO SUPPLY MGZ	The film supply magazine is not available.	Film supply not available.	<None>/interact
CHECK PRINTER	The printer is not ready at this time, operator intervention is required to make the printer available.	Check camera.	<None>/interact
CHECK PROC	The processor is not ready at this time, operator intervention is required to make the printer available.	Check processor.	<None>/interact
PRINTER DOWN	The printer is not operating due to some unspecified reason.	Camera down.	<None>/interact
PRINTER INIT	The printer is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.	Camera initializing.	<None>/Idle
PRINTER OFFLINE	The printer has been disabled by an operator or service person.	Camera off-line.	<None>/interact
PROC DOWN	The processor is not operating due to some unspecified reason.	Processor down.	<None>/interact
PROC INIT	The processor is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.	Processor initializing.	<None>/Idle
PROC OVERFLOW FL	Processor chemicals are approaching the overflow full mark.	Processor chemicals near overflow.	<None>/interact
PROC OVERFLOW HI	Processor chemicals have reached the overflow full mark.	Processor chemicals overflow.	<None>/interact
QUEUED	Print job in Queue	--	<None>/Idle
RECEIVER FULL	The film receive magazine is full.	Receiver full.	<None>/interact
REQ MED NOT INST	The requested film, paper, or other media supply magazine is installed in the printer but may be available with operator intervention.	Install media supply.	<None>/interact

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
REQ MED NOT AVAI	The requested film, paper, or other media requested is not available on this printer.	Media supply not available on this camera. Queue stopped. Change camera.	Queue for this camera will be STOPPED/ Queue stopped
RIBBON ERROR	There is an unspecified problem with the print ribbon.	Error with print ribbon.	<None>/interact
SUPPLY EMPTY	The printer is out of film.	Camera out of film.	<None>/interact
SUPPLY LOW	The film supply is low.	Film supply low.	<None>/interact
UNKNOWN	There is an unspecified problem.	Unspecified problem with camera.	<None>/interact

9.7.2 Additional DICOM Execution Status Information

Printer Status Info and Execution Status Info are defined terms and can therefore be extended or reduced by camera manufacturers. Therefore **SPECTsyngo** shall be flexible.

If any other printer status info or execution status info is received (as described in Table 167, **SPECTsyngo** will react as shown in the following table:

Table 168: Additional Printer Status Information

Printer Status / Execution	Printer / Execution Status Info	Description	Message string visible in the Job status bar	Other action for syngo / camera symbol
WARNING	<any other>	<not defined status info>	Camera info: <status info>	<None>/Interact
FAILURE	<any other>	<not defined status info>	Camera info: <status info> Queue stopped.	Queue for this camera will be STOPPED/ Queue stopped

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