syngo.via VB60A

DICOM Conformance Statement

SIEMENS Healthineers

DICOM Conformance Statement Overview

The **syngo.via** is comprised of a storage system (*syngo*.via Application Server), client review workstations (*syngo*.via Client) and connectivity to DICOM modalities and healthcare information systems. By default, one *syngo*.via (AE) is used. It is possible to configure usage of multiple different AEs for the individual DICOM services.
The **syngo.via**:

- requests and provides storage of objects (images, reports, encapsulated PDF)
- requests and provides Storage Commitment for the stored objects
- supports query and retrieval of objects from a remote node
- displays images to a user
- sends/transmits images to a printer
- imports and exports objects from portable interchange media
- retrieves requested procedures including scheduled procedure steps from RIS

The **syngo.via** 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

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 syngo.via					
		Create	**Send**	**Store**	**Display**
Siemens AX frame sets	1.3.12.2.1107.5.99.3.11	Yes	Yes	Yes	Yes
Siemens CT MR volume files	1.3.12.2.1107.5.99.3.10	Yes	Yes	Yes	Yes
SOP Classes managed by syngo.via					
		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	Yes	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	No
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	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

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
Digital Intra-Oral X-Ray Image - for Presentation - IMAGE	1.2.840.10008.5.1.4.1.1.1.3	Yes	Yes	Yes	No
Digital Intra-Oral X-Ray Image - for Processing - IMAGE	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	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	Yes	Yes	Yes	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes	Yes	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	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
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	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	Yes	Yes	Yes	Yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	No	Yes	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	No	Yes	Yes	No
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	No	Yes	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	No	Yes	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	No	Yes	Yes	No
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	No	Yes	Yes	No
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	No	Yes	Yes	No
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	No	Yes	Yes	No
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	No	Yes	Yes	No

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes	Yes	Yes
Colour Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes	Yes	No
Pseudo-Colour Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes	Yes	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes	Yes	No
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 Radio-fluoroscopy 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	No
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes	Yes	Yes
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	No	Yes	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	No	Yes	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes	Yes	No
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	No	Yes	Yes	No
Deformable Spatial Registration SOP Class	1.2.840.10008.5.1.4.1.1.66.3	Yes	Yes	Yes	No
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes	Yes	No
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Yes	Yes	Yes	No
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	Yes	Yes	No
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes	Yes	No
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes	Yes	No
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes	Yes	No
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	No	Yes	Yes	No
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	Yes	Yes	Yes	No
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	No	Yes	Yes	Yes
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Yes	Yes	Yes	No

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
Radiopharmaceutical Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.68	Yes	Yes	Yes	No
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	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 Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	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	No
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	No
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	No	Yes	Yes	No
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	
Query/Retrieve					
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	1.2.840.10008.5.1.4.1.2.2.2	Yes		Yes	

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
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
DVD		
STD-GEN-DVD	Yes	Yes
STD-GEN-DVD-J2K	Yes	Yes
Blu-Ray		
STD-GEN-BD-J2K	Yes	Yes
USB		
STD-GEN-USB-J2K	Yes	Yes

The ***syngo*.via Application Server** creates ISO files to be burnt by ***syngo*.via Client** local burning software (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, rather than; 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	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	**syngo.via**

1 Introduction

1.1 Revision history

Version/ Status	Date of Issue	Product / Version	Author	Change & Reason of Change
3.0	2021-09-06	syngo.via VB60A	Hiremath, Prabhulingayya(SHS TE DC IND DI-SY DEV1 VIA1)	Review findings incorporated.
2.1	2021-06-15	syngo.via VB60A	Krisztian Paka (ADV D EU HU OPS 4 3)	Brandville style
2.0	2021-06-14	syngo.via VB60A	Krisztian Paka (ADV D EU HU OPS 4 3)	Review findings incorporated.
1.1	2021-05-27	syngo.via VB60A	Krisztian Paka (ADV D EU HU OPS 4 3)	Modified: Table 1.
1.0	2020-04-06	syngo.via VB60A	Krisztian Paka (ADV D EU HU OPS 4 3)	Review findings incorporated.
0.1	2020-08-19	syngo.via VB60A	Krisztian Paka (ADV D EU HU OPS 4 3)	Draft version for syngo.via VB60A based on version 1.0 of syngo.via VB50A. and n/s Modules Trunk Conformance Statement template

1.2 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.

1.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between syngo.via and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM PS3.1-3.20 2016a 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 syngo.via 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.

1.4 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
ACR	American College of Radiology
ASCII	American Standard Code for Information Interchange
DB	Database
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
HCD	Hardcopy Device
IOD	DICOM Information Object Definition
ISO	International Standard Organization
MWL	Modality Worklist
n. a.	not applicable
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
SC	Storage Commitment
SCS	Specific Character Set
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
TLS	Transport Layer Security
U	Unique Key Attribute
UID	Unique Identifier
UTF-8	Unicode Transformation Format-8
VR	Value Representation

1.5 References

[1] Digital Imaging and Communications in Medicine (DICOM), https://www.dicomstandard.org/

[2] Integrating the Healthcare Enterprise – IHE Radiology Technical Framework – http://www.ihe.net

1.6 Scope and Field of Application

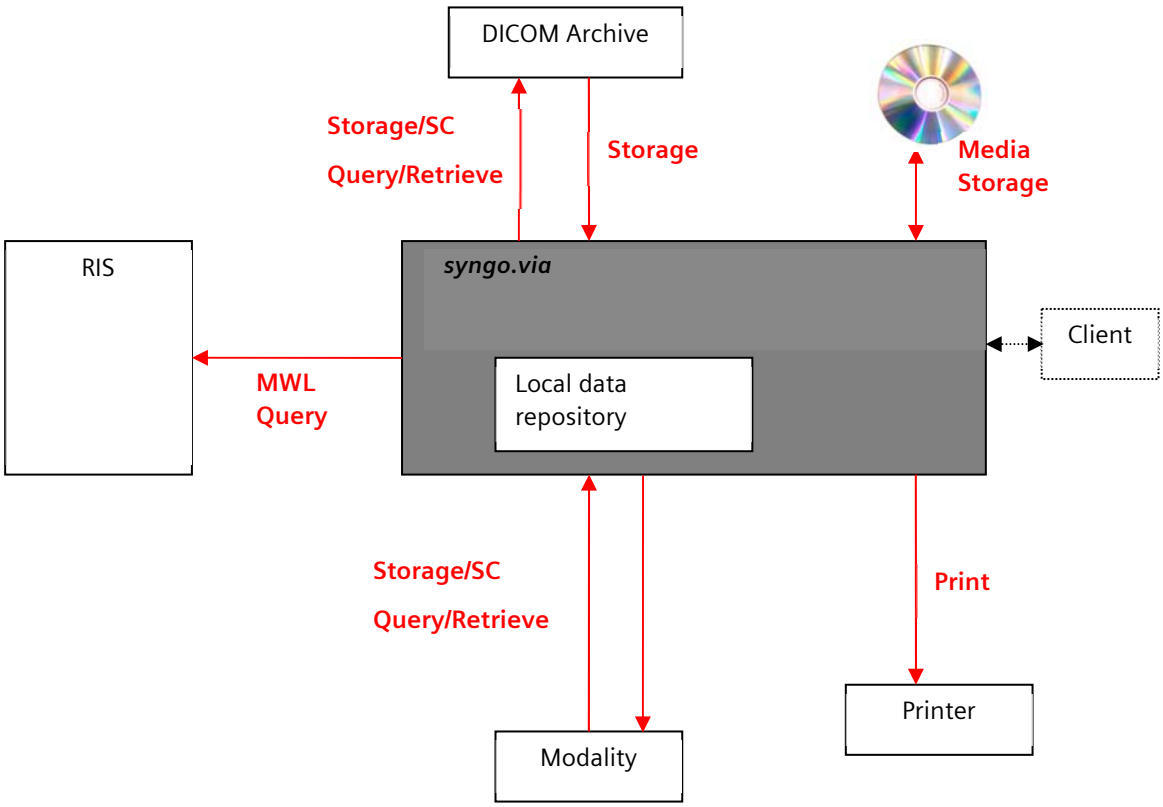


Figure 1: Overview about DICOM capabilities of Syngo.via VB60A

2 Networking

2.1 Implementation Model

syngo.via 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 **syngo.via** can query remote notes, retrieve and store selected instances from that node. Using the Modality Worklist service, the **syngo.via** 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.

2.1.1 Application Data Flow

The Application Data Flow diagram Figure 2 depicts the DICOM data flow to and from the individual applications within **syngo.via.**

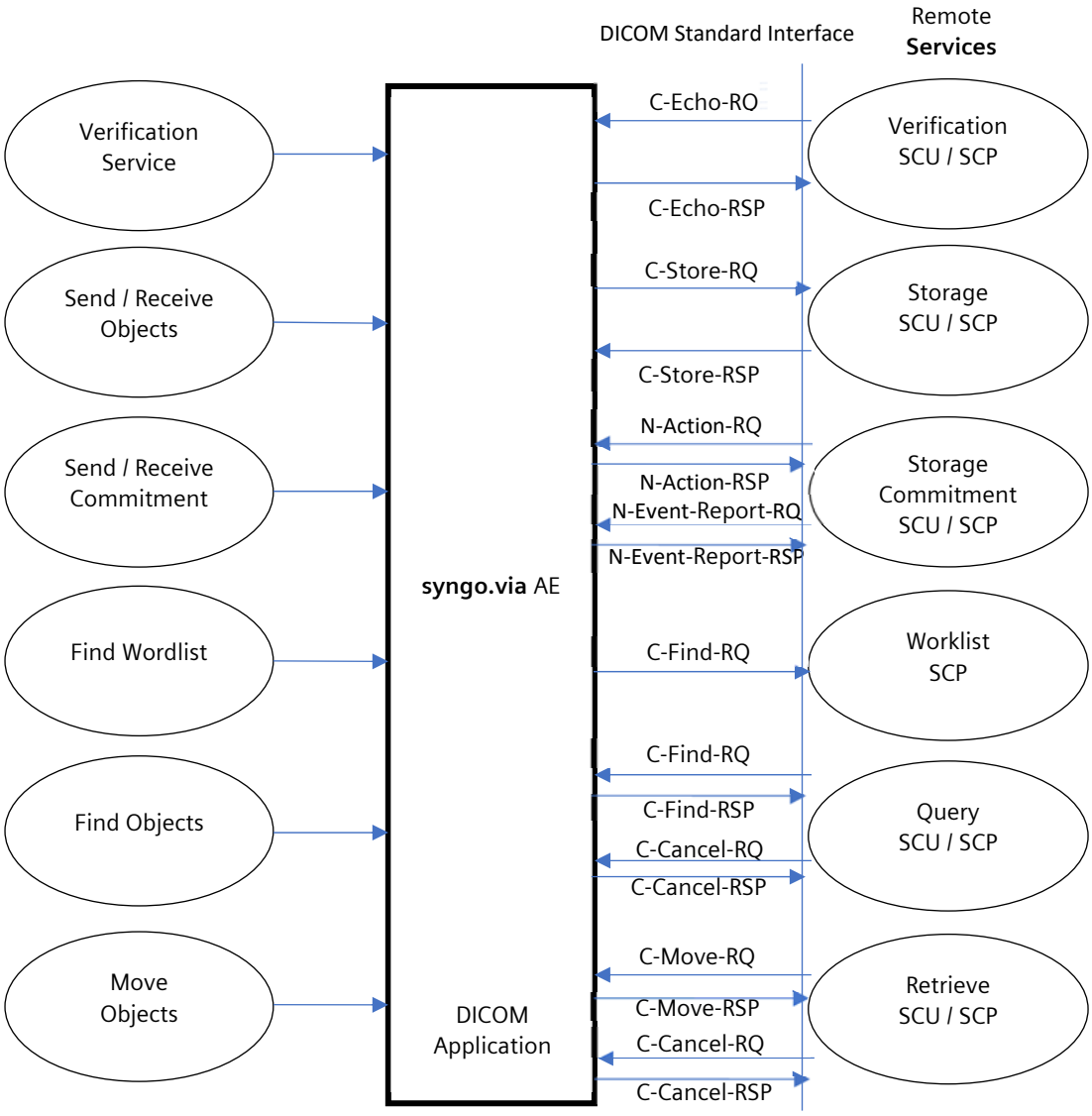


Figure 2: Syngo.via DICOM Data Flow diagram- Acquisition Workflow

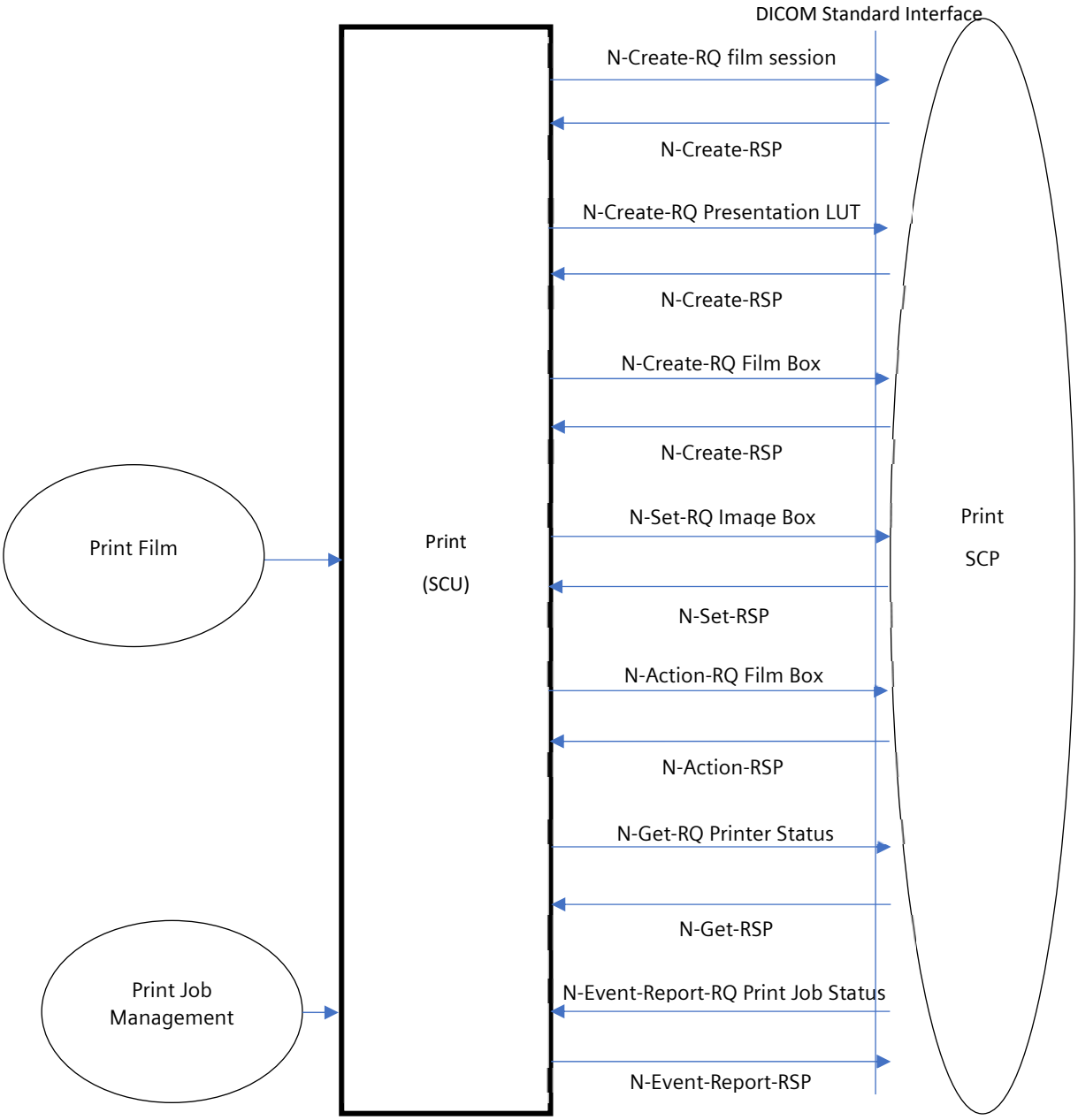


Figure 3: Syngo.via DICOM Data Flow diagram- Printing

2.1.2 Functional Definitions of Application Entities

The SCP components of the Application Entities of the syngo.via 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.

2.1.2.1 Functional Definition of Verification AE

The syngo.via 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-RQ.
As a SCP of the Verification Service the syngo.via processes and responds to incoming verification requests using the C-ECHO-RSP.

2.1.2.2 Functional Definition of Storage AE

The **syngo.via** 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-RQ. The transfer status is reported to the initiator of the Storage request.
The Storage SCP component of the syngo.via 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.

2.1.2.3 Functional Definition of the Storage Commitment AE

If configured, the **syngo.via** can serve as a SCU for the DICOM Storage Commitment service. Upon successful completion of a storage job, the system uses the N-ACTION-RQ 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 syngo.via can receive the N-EVENT-REPORT-RQ on the same or a different association.
The ***syngo.via*** can also serve as a SCP for the DICOM Storage Commitment service. In additional to each successfully completed send job, modalities should trigger a Storage Commitment request for the safekeeping of the images sent to the ***syngo*.via**.

2.1.2.4 Functional Definition of Query/Retrieve AE

The syngo.via supports DICOM Query/Retrieve as a SCU: The user can initiate a query to a remote node using the C-FIND-RQ. After matching the specified keys, the remote Query /Retrieve SCP uses the C-FIND-RSP to return the results of its search, which will be displayed to the user. Depending on user action the syngo.via Query/Retrieve DICOM SCU sends a C-MOVE-RQ 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 syngo.via supports the following query model:

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

2.1.2.5 Functional Definition of Modality Worklist AE

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

2.1.2.6 Functional Definition of Print AE

The Print SCU of the syngo.via 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.
The ***syngo*.via** will supply and require the mandatory SOP Classes of the color, grayscale or both Print Management Service Class as well as the optional Print Job and Presentation LUT SOP Classes.

2.1.3 Sequencing of Activities

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

2.1.3.1 Verify

The communication between *syngo.via* and an external DICOM node in case of Verify is depicted in Figure 4 in more detail.

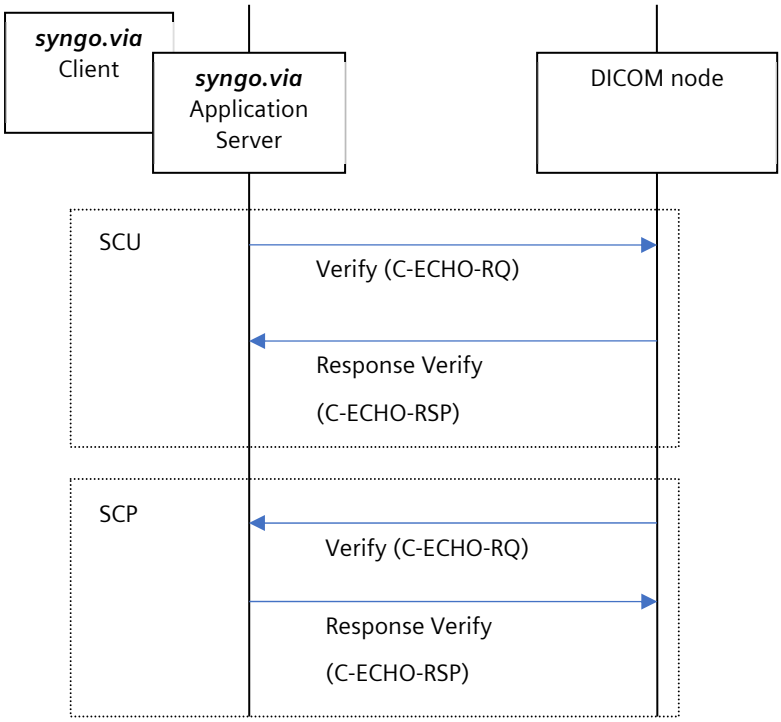


Figure 4: Sequence Diagram for Real World Activities- Verify

2.1.3.2 Storage / Storage Commitment

The communication between ***syngo*.via** and an external DICOM node in case of triggering the transfer of objects from ***syngo*.via** to the external node is depicted in Figure 5 in more detail.

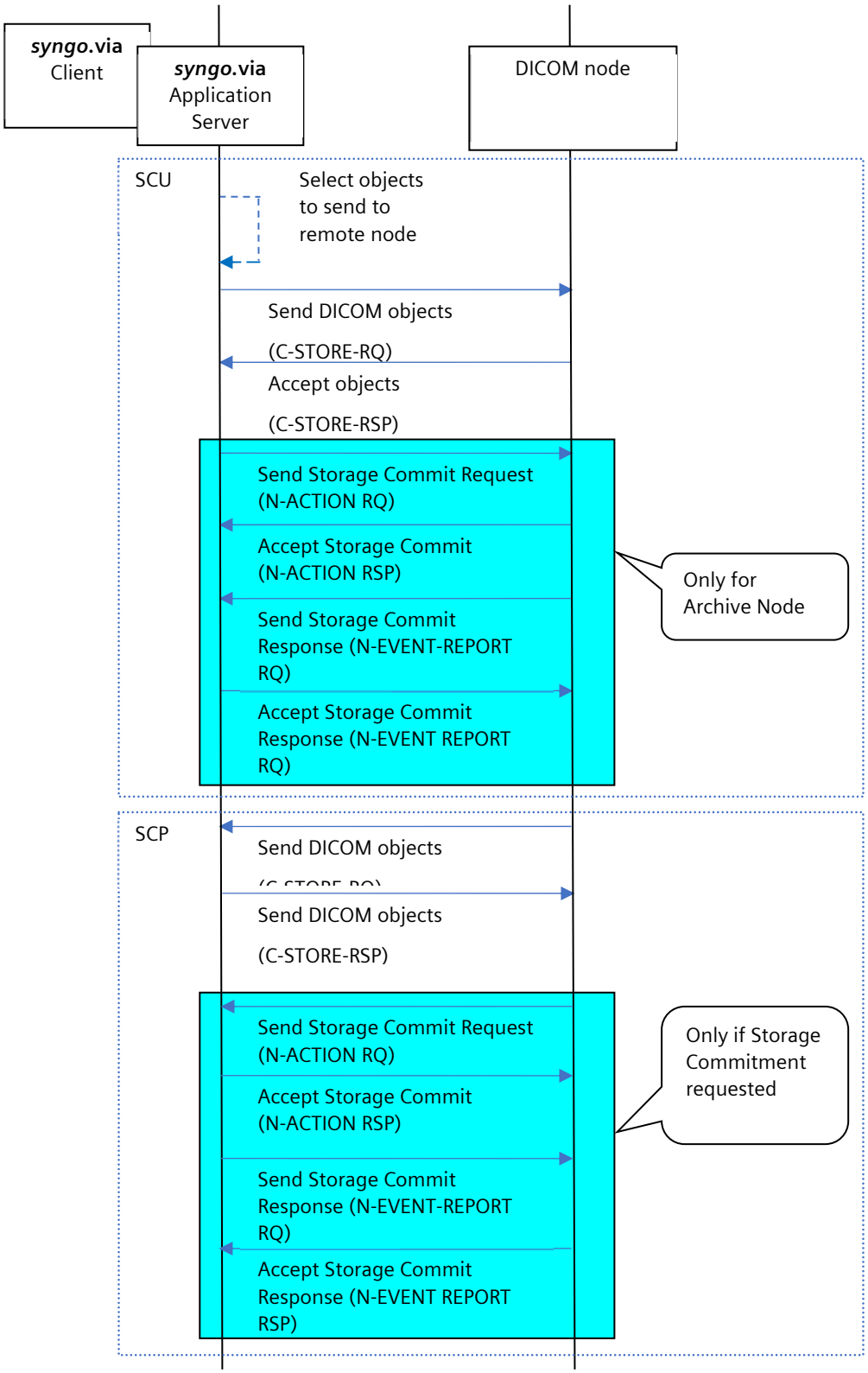


Figure 5: Sequence Diagram for Real World Activities - Storage / Storage Commitment

2.1.3.3 Query and Retrieval

The communication between ***syngo*.via** and an external DICOM node in case of querying of objects from a remote DICOM node and retrieval to ***syngo*.via** is depicted in Figure 6 in more detail.

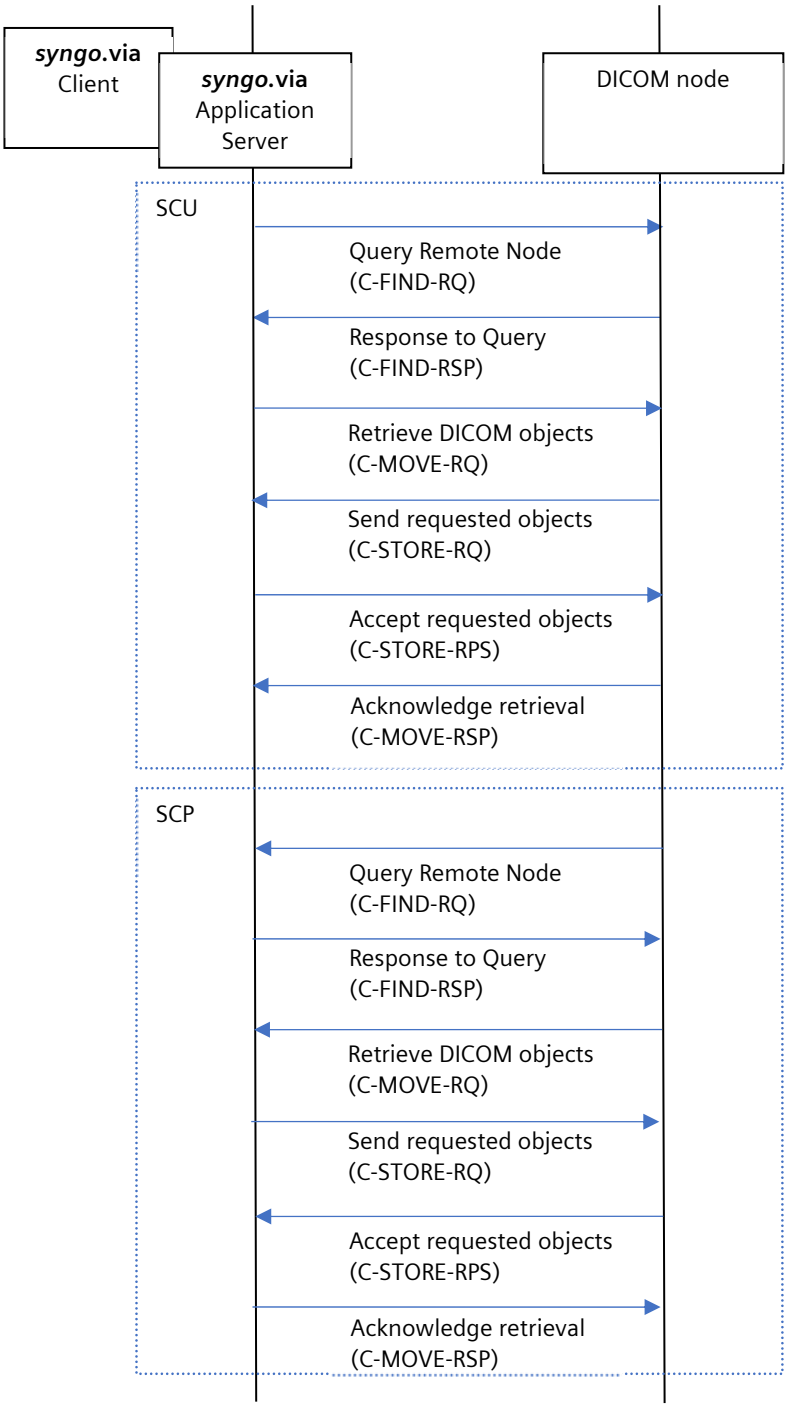


Figure 6: Sequence Diagram for Real World Activities – Query / Retrieve

2.1.3.4 Modality Worklist

The communication between ***syngo*.via** and an external DICOM node in case of Modality Worklist requests from ***syngo*.via** to a remote DICOM node is depicted in Figure 7 in more detail.

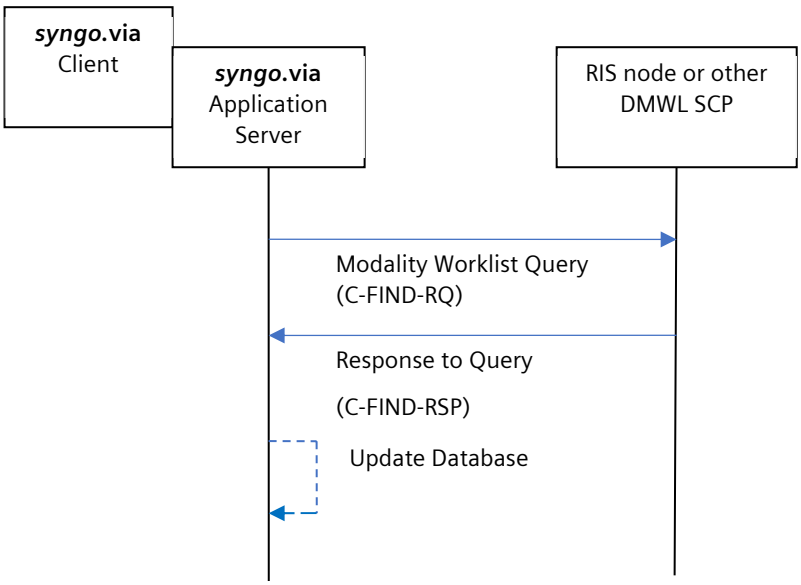
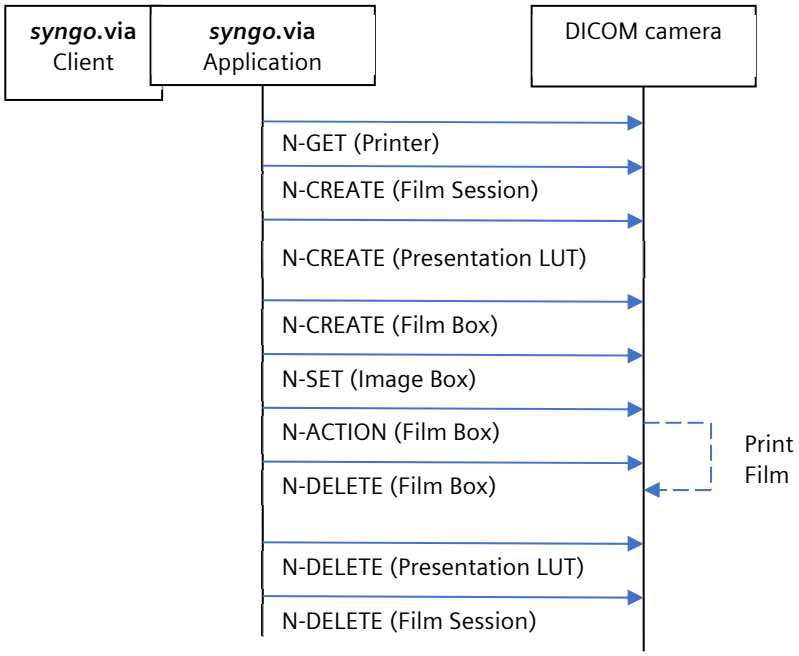


Figure 7: Sequence Diagram for Real World Activities – Modality Worklist

2.1.3.5 Printing Workflow

The communication between ***syngo.via*** and an external DICOM camera in case of printing of images is depicted in Figure 8 in more detail.



All events (arrows) stand for a request / response pair.

Figure 8: Sequence Diagram for Real World Activities - Printing

2.2 Application Entity Specification

This section outlines the specifications for each of the Application Entities that are part of the syngo.via.

2.2.1 Verification AE Specification

2.2.1.1 SOP Classes

The Verification AE of the syngo.via provides standard conformance to the Verification SOP Class listed in Table 1: Network Services section "Verification" in the "Conformance Statement Overview".

2.2.1.2 Association Policy

The syngo.via 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

The **syngo.via** AE 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. Nevertheless, transfer jobs to one distinct remote system (Send, Retrieve) will be run sequentially one after the other.

2.2.1.2.1 Asynchronous Nature

The **syngo.via** 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	Infinite

2.2.1.2.2 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*

2.2.1.3 Association Initiation Policy

2.2.1.3.1 Activity – "Send Verification" Request

2.2.1.3.1.1 Description and Sequencing of Activities

The **syngo.via** serves as a SCU of the Verification Service Class. A C-ECHO-RQ 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 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.

2.2.1.3.1.2 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

2.2.1.3.1.3 SOP specific Conformance – Verification SCU

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

2.2.1.4 Association Acceptance Policy

2.2.1.4.1 Activity – "Receive Verification Request"

2.2.1.4.1.1 Description and Sequencing of Activities

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

2.2.1.4.1.2 Accepted Presentation Contexts

The **syngo.via** 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

2.2.1.4.1.3 SOP specific Conformance – Verification SCP

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

2.2.2 Storage AE Specification

2.2.2.1 SOP Classes

The Storage AE provides Standard Conformance to the SOP Classes listed in "Table 1: Network Services" section "SOP Classes Created by the syngo.via" and "SOP Classes Managed by the syngo.via" in the "Conformance Statement Overview".

2.2.2.2 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 syngo.via 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.

[1] *Default, the value is configurable*

2.2.2.2.1 Asynchronous Nature

The syngo.via 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

2.2.2.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to "Table 3 - Implementation Identifying Information" in the "Conformance Statement Overview".

2.2.2.3 Association Initiation Policy

2.2.2.3.1 Activity – "Send To"

2.2.2.3.1.1 Description and Sequencing of Activities

Storage of DICOM object is either triggered internally in the ***syngo*.via** (either "Send to" from the UI or triggered by auto-archiving events; see also **Figure 5**) or by a C-MOVE-RQ initiated by an external DICOM AE to ***syngo*.via**.
If an association to a remote Application Entity could successfully be established, each image will be transferred one after another via the same open association.
Automatic retry mechanism:

Retries are performed if

- the network connection has been lost from SCU perspective. In this case retry is performed as soon as the network connection is available again
- the partner is not reachable for other reasons (e.g., partner node has broken down) that appear to be transient.

The number of retries and the interval between the retries are configurable (the default of retries is 2 and the interval is 30 seconds)
In case the transfer fails for a permanent reason (rejection permanent reported by SCP, all Presentation Contexts are refused, ...) the transfer will not be retried.

2.2.2.3.1.2 Proposed Presentation Contexts

For all Image Objects listed in Table 1: Network Services 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

UID value	Transfer Syntax	Image Objects	Non-Image Objects
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. The configuration can be performed in the Service UI.
An instance will be JPEG lossless compressed only if it fulfills the following criteria:

- Is an image and not already compressed
- Photometric Interpretation (0028,0004) is either MONOCHROME1, 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 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:

- 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:

- 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.

2.2.2.3.1.3 SOP specific Conformance for SOP classes

The syngo.via 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 syngo.via when encountering status codes in a C-STORE-RSP is summarized in **Table 11**:

Table 11: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Duplicate SOP Instance UID: some of the instances sent to the SCP were already available there.	0111	Job is continued till the end and marked as Completed(!). A warning mentions that some images were already available on the remote node. These will not be overwritten.
Error	Out-Of-Resources: The remote node has run out of resources (storage resources for example)	A7XX	Job is continued till the end. An according message is shown to the user.
Error	Any other DIMSE Error Status	Any non- null Code	Send is continued till the end. Log message is created. An according message is shown to the user. (e.g. percentage of transferred instances)
Success	Image is successfully stored on file system.	0000	Success reported to user

Table 12 below indicates the behavior if exceptions occur:

Table 12: DICOM Command Communication Failure Behavior

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

2.2.2.3.1.4 Encapsulation of SOP classes generated by syngo.via

Some PACS systems do not support specific SOP classes, like for example:

- Encapsulated PDF (1.2.840.10008.5.1.4.1.1.104.1)
- Real World Value Mapping (1.2.840.10008.5.1.4.1.1.67)
- Spatial Registration (1.2.840.10008.5.1.4.1.1.66.1)
- Segmentation (1.2.840.10008.5.1.4.1.1.66.4)

In order to enable archiving of instances of such SOP classes, ***syngo*.via** can pack them into a Basic Text Structured Report (SR) instance to enforce a SOP Class UID (0008,0016) '1.2.840.10008.5.1.4.1.1.88.11', supported by most PACS

systems. In case that a PACS system does not even support structured reports, the instance can also be packed into a Secondary Capture (SC) image with the SOP Class UID (0008,0016) '1.2.840.10008.5.1.4.1.1.7' if clinical administrator chooses this option. A well-defined list (see Table 13) of ***syngo*.via** internally generated objects can be packed. The bulk data (Content Sequence (0040, A730), Modality Image Header Type (0029,0008), Modality Image Header Version (0029,0009), Modality Image Header Info (0029,0010), Pixel Data (7FE0,0010) and Series Description (0008,103E)) of such generated instances contain a coding indicating that this is a Siemens private object created for archival purposes only.

2.2.2.3.1.5 Encapsulation of SOP classes generated by syngo.via

Some PACS systems do not support specific SOP classes, like for example:

- Encapsulated PDF (1.2.840.10008.5.1.4.1.1.104.1)
- Real World Value Mapping (1.2.840.10008.5.1.4.1.1.67)
- Spatial Registration (1.2.840.10008.5.1.4.1.1.66.1)
- Segmentation (1.2.840.10008.5.1.4.1.1.66.4)

In order to enable archiving of instances of such SOP classes, ***syngo*.via** can pack them into a Basic Text Structured Report (SR) instance to enforce a SOP Class UID (0008,0016) '1.2.840.10008.5.1.4.1.1.88.11', supported by most PACS systems. In case that a PACS system does not even support structured reports, the instance can also be packed into a Secondary Capture (SC) image with the SOP Class UID (0008,0016) '1.2.840.10008.5.1.4.1.1.7' if clinical administrator chooses this option. A well-defined list (see Table 13) of ***syngo*.via** internally generated objects can be packed. The bulk data (Content Sequence (0040, A730), Modality Image Header Type (0029,0008), Modality Image Header Version (0029,0009), Modality Image Header Info (0029,0010), Pixel Data (7FE0,0010) and Series Description (0008,103E)) of such generated instances contain a coding indicating that this is a Siemens private object created for archival purposes only.

Table 13: Packed SOP Classes

SOP Class Name	SOP Class UID
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5

2.2.2.3.1.6 Split not supported multiframe objects

If the remote node does not support the Enhanced MR Image Storage SOP Class by configuration (1.2.840.10008.5.1.4.1.1.4.1) but only the Magnetic Resonance Image Storage SOP Class (1.2.840.10008.5.1.4.1.1.4)

the multiframe images are split into supported single frames during storage. The Study Instance UID and Series Instance UID are kept but new SOP Instance UIDs are created for the derived objects.

2.2.2.3.1.7 Storage of DICOM private, CSA Non-Image

When objects of SOP Class 1.3.12.2.1107.5.9.1 (DICOM private, CSA Non-Image) are received by ***syngo*.via** new instances of SOP Class 1.2.840.10008.5.1.4.1.1.66.1 (Spatial Registration) are created which include the information of the original objects. For each affected CSA Non-Image, a new series is created for its own Spatial Registration object.

2.2.2.3.1.8 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).

2.2.2.4 Association Acceptance Policy

2.2.2.4.1 Activity – "Receive Instances"

2.2.2.4.1.1 Description and Sequencing of Activities

The **syngo.via** 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.

2.2.2.4.1.2 Accepted Presentation Contexts

For all supported Transfer Objects (see "Table 1: Network Services" section "SOP Classes Created by the syngo.via" and "SOP Classes Managed by the syngo.via" 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

2.2.2.4.1.3 SOP-specific Conformance Statement for Storage SOP classes

The **syngo.via** 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 syngo.via 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 14 below list the status codes that the syngo.via can return:

Table 14: 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 conform 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.

2.2.2.4.1.4 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.

2.2.3 Storage Commitment AE Specification

2.2.3.1 SOP Classes

The Storage Commitment AE of the syngo.via provides standard conformance to the SOP Class listed in "Table 1: Network Services" section "Storage Commitment" in the "Conformance Statement Overview".

2.2.3.2 Association Policy

Table 15: 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 syngo.via 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.

2.2.3.2.1 Asynchronous Nature

The syngo.via 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 16: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

2.2.3.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to "Table 3 - Implementation Identifying Information" in the "Conformance Statement Overview".

2.2.3.3 Association Initiation Policy

2.2.3.3.1 Activity "Send Initial Storage Commitment"

2.2.3.3.1.1 Description and Sequencing of Activities

The syngo.via 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-RQ, 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-RQ for a complete set (bundle) of instances or issue one N-ACTION-RQ per instance. This behavior is configurable; the default value is "bundled".

[1] Default, the value is configurable

The ***syngo.via*** will accept the N-EVENT-REPORT-RQ on the same association if sent immediately after the N-ACTION-RSP. However, it will not wait for it. The association is closed after three seconds.

2.2.3.3.1.2 Proposed Presentation Contexts

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

Table 17: 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		

SOP specific Conformance for SOP classes
The behavior of syngo.via when encountering status codes in an N-ACTION-RSP is summarized in Table 18:

Table 18: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Any failure that occurs	Any non-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 19 below indicates the behavior if exceptions occur:

Table 19: 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

2.2.3.3.2 Activity "Send Reply to Commitment Requests on separate associations"

2.2.3.3.2.1 Description and Sequencing of Activities

In case the **syngo.via** has received a Storage Commitment request (N-ACTION-RQ) from an external node, the ***syngo*.via** initiates a new association in order to send the N-EVENT-REPORT-RQ to the SCU (Storage Commitment initiator).

2.2.3.3.2.2 Proposed Presentation Contexts

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

Table 20: 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		

2.2.3.3.2.3 SOP specific Conformance for SOP classes

The behavior of syngo.via when encountering status codes in an N-EVENT-REPORT-RSP is summarized in Table 21:

Table 21: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Storage Commitment Reply ignored.	Any none null Code	Storage Commitment will be repeated.
Success	Storage Commitment Reply noticed.	0000	Success reported to user.

syngo.via does not support the optional Storage Media File-Set ID and UID attributes in the N-ACTION.

2.2.3.4 Association Acceptance Policy

2.2.3.4.1 Activity "Receive Initial Storage Commitment Request"

2.2.3.4.1.1 Description and Sequencing of Activities

When receiving an initial Storage Commitment request (N-ACTION-RQ) the ***syngo*.via** will accept it with an N-ACTION-RSP and trigger a check in the database for the required instances.

The subsequently issued N-EVENT-REPORT-RQ will always be sent in a second association.
***syngo*.via** will store SOP instances indefinitely unless the instances are manually deleted by a user or automatically by a watermark system, if the images have been routed to a PACS and the PACS committed the images back to ***syngo*.via**. The manual deletion may lead to deletion of acknowledged instances before archiving to PACS has happened.

2.2.3.4.1.2 Accepted Presentation Contexts

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

Table 22 - Acceptable Presentation Contexts for Storage Commitment and Activity "Receive Commitment Request"

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		

2.2.3.4.1.3 SOP-specific Conformance Statement for Storage Commitment SOP classes

There are only 2 different return status codes for the commitment request itself. They indicate only whether the request was successfully received or not. The real response is sent via N-EVENT-REPORT-RQ either on the same or on a different association.
Success or failure of Storage Commitment will be signaled via the N-EVENT-REPORT primitive.
The SCU is responsible for creating a unique Transaction UID. The SCP will not check whether the UID is already in use or not.

Table 23: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	success	0000	Image received correctly (success notification is done after receiving, before indexing and storing)
Failure	Unable to Process	Cxxx	Error during instance reception
Failure	Data set does not match SOP Class	A9xx	The data set is not conform to the SOP Class contained in the resource.

2.2.4 Query/Retrieve AE Specification

2.2.4.1 SOP Classes

The Query/Retrieve AE provides Standard Conformance to the SOP Classes listed in "Table 1: Network Services" section "Query/Retrieve" in the "Conformance Statement Overview".

2.2.4.2 Association Policy

Table 24: 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 syngo.via 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.

2.2.4.2.1 Asynchronous Nature

The syngo.via 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 25: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

2.2.4.2.2 Implementation Identifying Information

For Implementation Identifying Information please refer to "Table 3 - Implementation Identifying Information" in the "Conformance Statement Overview".

2.2.4.3 Association Initiation Policy

2.2.4.3.1 Activity "Querying a Remote Node" for Instances

2.2.4.3.1.1 Description and Sequencing of Activities

The syngo.via serves as a SCU for the following SOP Class

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

[1] Default, the value is configurable

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

2.2.4.3.1.2 Proposed Presentation Contexts

The syngo.via will propose Presentation Contexts as shown in the following table:

Table 26: Proposed Presentation Contexts for Query

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
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		

Table 27: Extended Negotiation as an SCU

Name	UID	Extended Negotiation
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.

2.2.4.3.1.3 SOP Specific Conformance Statement to Query SOP classes

The syngo.via checks for the following status codes in the Query SCP's C-FIND-RSP:

Table 28: 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 non-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 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

The syngo.via supports the following query levels:

- Study
- Series

Matching Keys on Instance Level is not supported by the syngo.via 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 30: 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
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				

Attribute Name	Tag	Type	User input	UI
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 \ Requested Procedure ID	(0040,0275) \ (0040,1001)	O	enter value	yes
Request Attributes Sequence \ Scheduled 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

2.2.4.4 Association Acceptance Policy

2.2.4.4.1 Activity "Move SCU"

2.2.4.4.1.1 Description and Sequencing of Activities

The C-MOVE-RQs are used to retrieve the referenced images. The Retrieve AE supports the query model Study Root.

2.2.4.4.1.2 Accepted Presentation Contexts

The syngo.via proposes Presentation Contexts shown in the following table:

Table 31: 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		
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		

SOP Specific Conformance Statement for Move SCU Classes
The behavior of syngo.via when encountering status codes in a C-MOVE response is summarized in Table 32.

Table 32: 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 none 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 33 below indicates the behavior if exceptions occur:

Table 33: DICOM Command Communication Failure Behavior

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

2.2.4.4.2 Activity "Move SCP"

2.2.4.4.2.1 Description and Sequencing of Activities

The Retrieve AE responds to retrieve requests of an SCU. The requests are used to retrieve the referenced images. The Retrieve AE supports the query model Study Root.

2.2.4.4.2.2 Accepted Presentation Contexts

The syngo.via proposes Presentation Contexts shown in the following table:

Table 34: Acceptable Presentation Contexts for Retrieve and Activity "MOVE SCP"

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		Implicit VR Little Endian	1.2.840.10008.1.2	SCP	No

Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	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 Only Query/ Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.2.4.4.2.3 SOP Specific Conformance Statement for Move SCU Classes

At association establishment time the C-MOVE presentation context is negotiated. When the C-MOVE-RQ is processed, the Move Destination attribute (receiver of images) is ignored. However, the Move Destination AE must conform to the DICOM conventions (value representation AE).
The Retrieve AE sends continuously C-MOVE responses to indicate progress about the de-archiving of images. The C-MOVE-RSP contains the Service parameters listed in **Table 35**.

Table 35: C-MOVE-RSP Service Parameters

Attribute	Meaning
Number of Remaining Sub-Operation	Is sent if the C-MOVE-RSP has the status Pending. Indicates the number of images which have not yet been sent.
Number of Completed Sub-Operation	Indicates the number of images which were sent.
Number of Failed Sub-Operation	Number of failing images within the Sending Association (C-STORE)
Number of Warning Sub-Operation	Always 0.

The final C-MOVE-RSP is sent after all images have been de-archived either successfully or unsuccessfully.

2.2.4.4.2.4 Return Codes

Table 36 below indicates the behavior if exceptions occur:

Table 36: Retrieve C-MOVE Response Status

Service Status	Further Meaning	Error Code	Behavior
Success	success	0000	Image received correctly (success notification is done after receiving, before indexing and storing)
Failure	Out-of-resource	A700	Not 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 conforming to the SOP Class contained in the resource.

2.2.4.4.3 Activity "Receive Instance Retrieve Requests"

2.2.4.4.3.1 Description and Sequencing of Activities

The ***syngo*.via** responds to requests issued by an SCU with the query model Patient Root, Study Root and Patient/Study Only.
Hierarchical and relational retrieve operations are both supported.

2.2.4.4.3.2 Accepted Presentation Contexts

The syngo.via will accept Presentation Contexts as shown in the following table:

Table 37: Acceptable Presentation Contexts Activity "Receive Instance Retrieve Request"

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	SCP	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	SCP	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	SCP	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Table 38: Extended Negotiation as an SCP

SOP Class Name	SOP Class 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 if necessary, as defined in DICOM PS3.4
Study Root Query/ Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Relational Query will be negotiated if necessary, as defined in DICOM PS3.4

2.2.4.4.3.3 SOP Specific Conformance Statement for Move SCU Classes

At The *syngo.via* Query AE supports all Query attributes of Table 39.

Table 39: Attributes supported for instance Query SCP

Attribute Name	Tag	Type	Matching
Patient Level[1]			
Patient's Name	(0010,0010)	O	wildcard[2]
Patient ID	(0010,0020)	O	wildcard
Patient's Birth Date	(0010,0030)	O	universal (Null)
Patient's Birth Time	(0010,0032)	O	universal (Null)
Patient's Sex	(0010,0040)	O	universal (Null)
Issuer of Patient ID	(0010,0021)	O	wildcard
Other Patient Names	(0010,1001)	O	-
Other Patient IDs	(0010,1000)	O	-
Ethnic Group	(0010,2160)	O	-
Military Rank	(0010,1080)	O	-
Patient's Address	(0010,1040)	O	-
Patient Comments	(0010,4000)	O	-
Medical Alerts	(0010,2000)	O	-
Contrast Allergies	(0010,2110)	O	-
Smoking Status	(0010,21A0)	O	-
Pregnancy Status	(0010,21C0)	O	-
Last Menstrual Date	(0010,21D0)	O	-
Special Needs	(0038,0050)	O	-
Confidentiality Constraint on Patient Data Description	(0040,3001)	O	-
Study Level[3]			
Patient's Name	(0010,0010)	O	wildcard2
Patient ID	(0010,0020)	O	wildcard
Patient's Birth Date	(0010,0030)	O	universal (Null)
Patient's Birth Time	(0010,0032)	O	universal (Null)
Patient's Sex	(0010,0040)	O	universal (Null)
Issuer of Patient ID	(0010,0021)	O	wildcard
Other Patient Names	(0010,1001)	O	-
Other Patient IDs	(0010,1000)	O	-
Ethnic Group	(0010,2160)	O	-

Attribute Name	Tag	Type	Matching
Military Rank	(0010,1080)	O	-
Patient's Address	(0010,1040)	O	-
Patient Comments	(0010,4000)	O	-
Medical Alerts	(0010,2000)	O	-
Contrast Allergies	(0010,2110)	O	-
Smoking Status	(0010,21A0)	O	-
Pregnancy Status	(0010,21C0)	O	-
Last Menstrual Date	(0010,21D0)	O	-
Special Needs	(0038,0050)	O	-
Confidentiality Constraint on Patient Data Description	(0040,3001)	O	-
Patient's Size	(0010,1020)	O	-
Patient's Weight	(0010,1030)	O	-
Additional Patient History	(0010,21B0)	O	-
Accession Number	(0008,0050)	O	wildcard
Study ID	(0020,0010)	O	wildcard
Study Instance UID	(0020,000D)	U	universal (Null)
Study Date	(0008,0020)	O	universal (Null)
Study Time	(0008,0030)	O	universal (Null)
Study Comments	(0032,4000)	O	wildcard
Name of Physician (s) Reading Study	(0008,1060)	O	wildcard
Referring Physician' s Name	(0008,0090)	O	wildcard
Study Description	(0008,1030)	O	wildcard
Number of Study related Instances	(0020,1208)	O	universal (Null)
Modalities in Study	(0008,0061)	O	universal (Null)
Admitting Diagnosis Description	(0008,1080)	O	-
Patient's Institution Residence	(0038,0400)	O	-
Admission ID	(0038,0010)	O	-
Requesting Physician	(0032,1032)	O	wildcard
Number of Study Related Series	(0020,1206)	O	universal (Null)
Series Level			
Modality	(0008,0060)	O	universal (Null)
Series Date	(0008,0021)	O	universal (Null)
Series Time	(0008,0031)	O	universal (Null)
Number of Series related Instances	(0020,1209)	O	universal (Null)

Attribute Name	Tag	Type	Matching
Series Number	(0020,0011)	O	universal (Null)
Series Description	(0008,103E)	O	wildcard
Institutional Department Name	(0008,1040)	O	wildcard
Request Attributes Sequence \ Requested Procedure ID	(0040,0275) \ (0040,1001)	O	wildcard
Request Attributes Sequence \ Scheduled Procedure Step ID	(0040,0275) \ (0040,0009)	O	wildcard
Performed Procedure Step Start Date	(0040,0244)	O	universal (Null)
Performed Procedure Step Start Time	(0040,0245)	O	universal (Null)
Series Instance UID	(0020,000E)	U	universal (Null)
Manufacturer's Model Name	(0008,1090)	O	wildcard
Patient Position	(0018,5100)	O	-
Station Name	(0008,1010)	O	wildcard
Institution Name	(0008,0080)	O	wildcard
Institution Address	(0008,0081)	O	wildcard
Performing Physician's Name	(0008,1050)	O	wildcard
Operators' Name	(0008,1070)	O	-
Body Part Examined	(0018,0015)	O	universal (Null)
Protocol Name	(0018,1030)	O	wildcard
Laterality	(0020,0060)	O	-
Frame of Reference UID	(0020,0052)	O	-
Manufacturer	(0008,0070)	O	-
Device Serial Number	(0018,1000)	O	-
Series Type	(0054,1000)	O	-
Counts Source	(0054,1002)	O	-
Corrected Image	(0028,0051)	O	-
Units	(0054,1001)	O	-
Instance Level			
Instance Number	(0020,0013)	O	universal (Null)
Image Type	(0008,0008)	O	-
Instance Creation Date	(0008,0012)	O	-
Instance Creation Time	(0008,0013)	O	-
Acquisition Date	(0008,0022)	O	universal (Null)
Acquisition Time	(0008,0032)	O	universal (Null)
Slice Location	(0020,1041)	O	-

Attribute Name	Tag	Type	Matching
Content Date	(0008,0023)	O	-
Content Time	(0008,0033)	O	-
SOP Class UID	(0008,0016)	O	universal (Null)
SOP Instance UID	(0008,0018)	U	universal (Null)
Retrieve AE Title	(0008,0054)	O	-
Source AE Title	(0002,0016)	O	-
Acquisition Number	(0020,0012)	O	-
Rows	(0028,0010)	O	-
Columns	(0028,0011)	O	-
Bits Allocated	(0028,0100)	O	-
Number of Frames	(0028,0008)	O	-
Slice Thickness	(0018,0050)	O	universal (Null)
Instance Availability	(0008,0056)	O	-
Image Comments	(0020,4000)	O	-
Treatment Date	(3008,0250)	O	-
Treatment Time	(3008,0251)	O	-
Calibration Image	(0050,0004)	O	-
Image Laterality	(0020,0062)	O	-
Patient Orientation	(0020,0020)	O	-
Contrast/Bolus Total Dose	(0018,1044)	O	-
Image Position (Patient)	(0020,0032)	O	-
Image Orientation (Patient)	(0020,0037)	O	-
Data Collection Center (Patient)	(0018,9313)	O	-
Reconstruction Target Center (Patient)	(0018,9318)	O	-
Contrast/Bolus Agent	(0018,0010)	O	-
KVP	(0018,0060)	O	-
Gantry/Detector Tilt	(0018,1120)	O	-
Convolution Kernel	(0018,1210)	O	-
Exposure Time	(0018,1150)	O	-
Acquisition Duration	(0018,9073)	O	-
Exposure	(0018,1152)	O	-
Single Collimation Width	(0018,9306)	O	-
CT Exposure Sequence \ CTDIvol	(0018,9321) \ (0018,9345)	O	-

Attribute Name	Tag	Type	Matching
Acquisition Datetime	(0008,002A)	O	-
Contrast/Bolus Agent Sequence \ Code Value	(0018,0012) \ (0008,0100)	O	-
Contrast/Bolus Agent Sequence \ Coding Scheme Designator	(0018,0012) \ (0008,0102)	O	-
Contrast/Bolus Agent Sequence \ Coding Scheme Version	(0018,0012) \ (0008,0103)	O	-
Contrast/Bolus Agent Sequence \ Code Meaning	(0018,0012) \ (0008,0104)	O	-
Contrast/Bolus Ingredient	(0018,1048)	O	-
Positioner Primary Angle	(0018,1510)	O	-
Positioner Secondary Angle	(0018,1511)	O	-

1 - *Patient Root Information Model only*
2 - Always a "" is appended to the user-supplied string*
3 - Study Root Information Model only

The query attribute contents will be treated case insensitive. Wildcards (*,?) will not replace component and component group separators (^, =).

For attributes with PN value representation the following components (from all three-component group) are used for matching:

- family name complex
- given name complex
- middle name

Universal matching is applied for PN components.

Regardless of extended negotiation, ***syngo*.via** does not consider the value of time zone offset from UTC (0008,0201) to adjust values of time attributes from the local time zone to UTC for matching.

Single value matching of date and time is performed by meaning. For example:

- TM "2230" matches values:

  "2230", "223000", from "223000." to "223059.999999" including all values extended with trailing zeros (e.g., "223000.500").

Range matching of date and time is performed by meaning. For example:

- TM "21-224010" matches values:

  "21", "2100", "210000", from "210000." to "224010.999999" including all values extended with trailing zeros (e.g., "224010.500").

Regardless of extended negotiation of combined date time matching, a pair of attributes that are a date and a time, both of which specify the same form of range matching, will have the concatenated string values of each range matching component matched as if they were a single date time attribute.

For example, a Study Date of "20060705-20060707" and a Study Time of "1000-1800" will match the time period of July 5, 10am until July 7, 6pm, rather than the three time periods of 10am until 6pm on each of July 5, July 6 and July 7, as would be the case without extended negotiation.

In case of combined date time matching the time condition also matches with undefined/null time values.
The Query AE of the ***syngo*.via** does not return any Media File-Set ID or UID, they always return the Retrieve AET (0008,0054). Furthermore, "Instance Availability" (0008,0056) is always returned.

Enterprise Query:

It is possible to group several ***syngo*.via** systems in an "Enterprise Group" (via configuration).

2.2.4.4.3.4 Enterprise Query:

It is possible to group several syngo.via systems in an "Enterprise Group" (via configuration).
A special Query SCP AET is available which spans the Query to the complete Enterprise Group. This AET is automatically created and has always the following syntax: "<Hostname>_E", where <Hostname> is the AET of the corresponding syngo.via server, automatically shortened to 14 characters in order to keep the total AET length beneath 16 char (DICOM Conformance). A Query sent to this AET will return all matching attributes present in all syngo.via systems configured in the Enterprise Group. The returned Retrieve AET allows to retrieve the instances directly from the syngo.via storing them.

2.2.4.4.3.5 Hierarchical and Relational Queries

Independent of the negotiation for relational queries, each C-FIND-RQ is treated as if it was a relational query. The SCP allows any combination of keys at or above the provided Query/Retrieve level in the hierarchy. Keys below Query/Retrieve level return an error.
But if for example a series level attribute is requested in a study level query, an error will be returned by syngo.via (code "0106").

2.2.4.4.3.6 Return Codes

Table 40 below indicates the behavior if exceptions occur:

Table 40: Query C-FIND / C-CANCEL Response Status

Service Status	Further Meaning	Error Code	Behavior
Failure	Parsing or translation of the DICOM request failed. A response could not be generated. The response could not be sent to the SCU. The query of the database failed.	C001	Any error during Query in the Database
Success	Matching is complete - No final Identifier is supplied	0000	
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Further Items will be returned;
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Further Items will be returned; Some of Required Attributes are not present in the Database

The maximum number of matches returned can be configured. The status of the final response will always be SUCCESS whether the clipping occurred or not.

2.2.5 Modality Worklist AE Specifation

2.2.5.1 SOP Classes

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

2.2.5.2 Association Policy

Table 41: 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 syngo.via 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.

2.2.5.2.1 Asynchronous Nature

The syngo.via 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 42: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

2.2.5.2.2 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

2.2.5.3 Association Initiation Policy

2.2.5.3.1 Activity "Querying a Remote Node" for Modality Worklist

2.2.5.3.1.1 Description and Sequencing of Activities

A network application will perform worklist queries with the C-FIND-RQ at regular intervals. The received worklist items will be compared with the contents of the local workflow management database. New items will be inserted into workflow management database. The results are used to prepare subsequent workflow tasks, when receiving instances.

2.2.5.3.1.2 Proposed Presentation Contexts

The syngo.via will propose Presentation Contexts as shown in the following table:

Table 43: 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		

2.2.5.3.1.3 SOP Specific Conformance for SOP Classes

Search Key Attributes of the Worklist C-FIND

The syngo.via 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 44: 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	"*" or <configured Modality>
>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	
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

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

[b] 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)

The syngo.via 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 45: 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	-	
>Scheduled Procedure Step Start Time	(0040,0003)	1	-	
>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 "Performed Protocol Code Sequence"

Attribute Name	Tag	Return Key Type	UI	Notes
>>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

Attribute Name	Tag	Return Key Type	UI	Notes
				"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	-	
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.

Attribute Name	Tag	Return Key Type	UI	Notes
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	yes	
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	yes	
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	-	

Attribute Name	Tag	Return Key Type	UI	Notes
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	-	
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 syngo.via when encountering status codes in a C-FIND response is summarized in Table 46:

Table 46: 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 non-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 47 below indicates the behavior if exceptions occur:

Table 47: DICOM Command Communication Failure Behavior

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

2.2.5.4 Association Acceptance Policy

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

2.2.6 Print AE Specification

2.2.6.1 SOP Classes

The Print AE provides Standard Conformance to the SOP Classes listed in "Table 1: Network Services" section "Print Management" in the "Conformance Statement Overview".

2.2.6.2 Association Policy

Table 48: 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 **syngo.via** 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.

2.2.6.2.1 Asynchronous Nature

The syngo.via 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 49: Asynchronous Nature as an Association Initiator

Maximum number of outstanding asynchronous transactions	10

[1] Default, the value is configurable

2.2.6.3 Association Initiation Policy

2.2.6.3.1 Activity "Print Film"

2.2.6.3.1.1 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.
After he 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.

2.2.6.3.1.2 Proposed Presentation Context

The syngo.via proposes Presentation Contexts as shown in the following table:

Table 50: 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
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
Basic Color Image Box SOP SOP Class	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.2.6.3.1.3 SOP Specific Conformance

The syngo.via 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.
The command communication failure behavior for the following subchapters is identical. Therefore, it has been put as only one table to this position:

Table 51: DICOM Command Communication Failure Behavior

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

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 syngo.via 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 52: 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 53: 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 syngo.via **syngo.via** 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 syngo.via DICOM Print Management SCU:

Table 54: 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
> 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 syngo.via 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 55: 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 56: 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 57: 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 58: 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 59: 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 60: DICOM Command Response Status Handling Behavior for Basic Color Image Box SOP Class

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 syngo.via 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 61: 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 62: 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.

The SCU uses the mandatory N-EVENT-REPORT DIMSE service to monitor the changes of the printer status in an asynchronous way.

It can directly ask the Printer (SCP) for its status or receive Events from the Printer asynchronously:

- N-GET as SCU
- N-EVENT-REPORT as SCU

In both cases the information listed in the two following tables is supported:

Table 63: Used Printer N-EVENT-REPORT-RQ attributes

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

Table 64: Used Printer N-GET-RSP attributes

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 7.6 for possible values.

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

Table 65: DICOM Command Communication Failure Behavior

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

Print Job SOP Class
The Print Job SOP Class is the possibility to monitor the execution of the print process.

The ***syngo*.via** DICOM Print Management application supports the optional N-EVENT-REPORT DIMSE Service to receive the changes of the Print Job Status in an asynchronous way. It can receive Events from the Print SCP asynchronously.

Note: The ***syngo*.via** DICOM Print Management application does not support receiving N-EVENT-REPORT requests from the camera during print sessions. Normally this is configurable in the camera. Refer to Table 66 for the N-EVENT-REPORT attributes the ***syngo*.via** DICOM Print Management application can handle.

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

Table 66: Used Print Job N-EVENT-REPORT attributes

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

2.2.6.4 Association Acceptance Policy

The syngo.via does not provide the functionality of a SCP of the Print Job SOP Class.

2.3 Network Interfaces

2.3.1 Physical Network Interface

The syngo.via provides DICOM 3.0 TCP/IP network communication support as defined in Part 8 of the DICOM 2016a 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.

2.3.2 Additional Protocols

none

2.3.3 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.

2.4 Configuration

2.4.1 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.

2.4.1.1 Local AE Titles

The syngo.via 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.

Table 67: Local AE Titles

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

2.4.1.2 Remote AE Title/Presentation Address Mapping

2.4.1.2.1 Remote Association Initiators

All relevant remote applications that may setup DICOM associations towards ***syngo.via*** need to be configured in syngo.via, 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 can later on 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.

2.4.1.2.2 Remote Association Acceptors

For remote applications that shall be able to accept DICOM associations from ***syngo.via***, 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 ***syngo.via*** 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.

2.4.1.3 Secure DICOM Communication

The system supports configuring the DICOM communication to use secure channel (TLS) between syngo.via 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 syngo.via 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 syngo.via will not accept the certificate.

2.4.2 Parameters

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

Table 68: Parameter List

Parameter	Configurable	Default Value
PDU size	Yes	32768 Bytes
time-out for accepting/rejecting an association request	Yes	30 s

Parameter	Configurable	Default Value
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

3 Media Interchange

3.1 Implementation Model

3.1.1 Application Data Flow Diagram

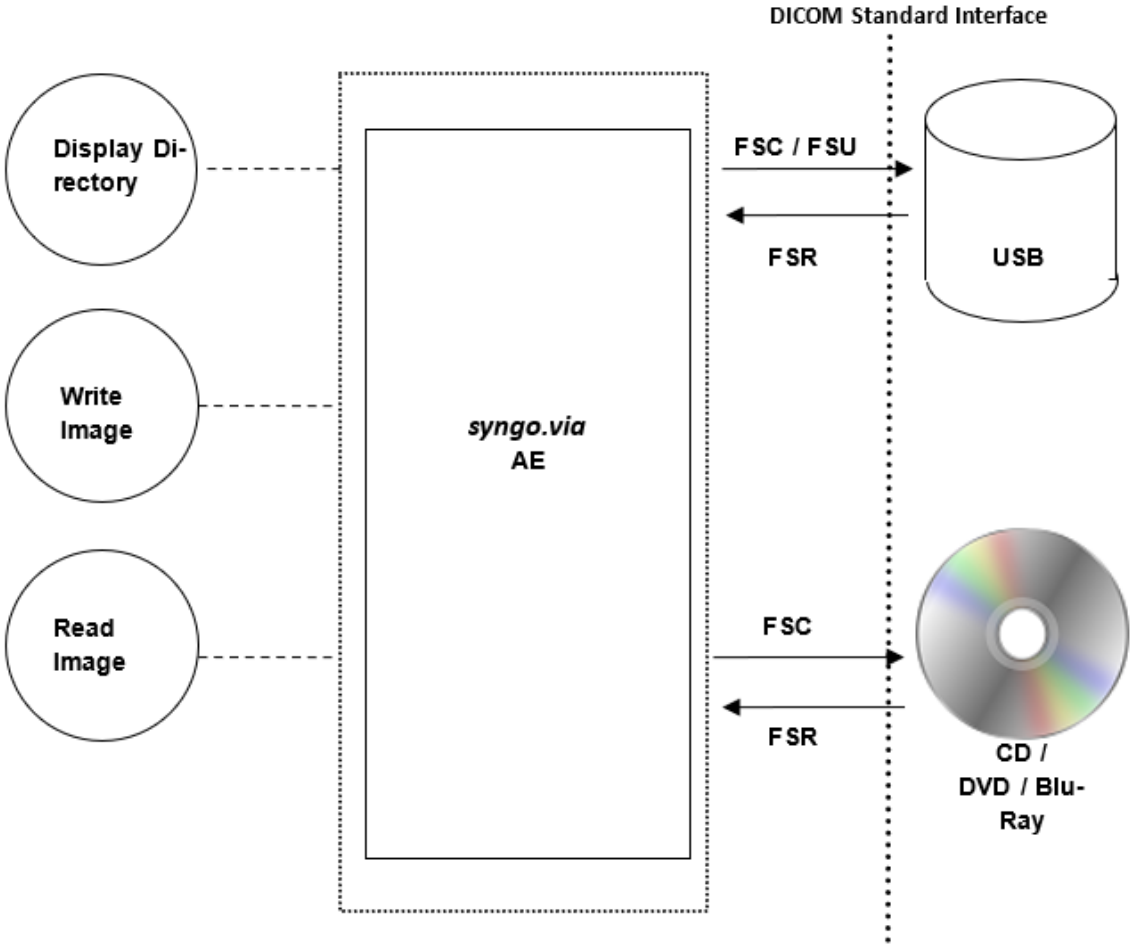


Figure 9: Media Interchange Application Data Flow Diagram

The **syngo.via** 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 ready-to-burn ISO Image can also be generated. All SOP Classes defined in Table 1 are supported for the Import/Export functionality.

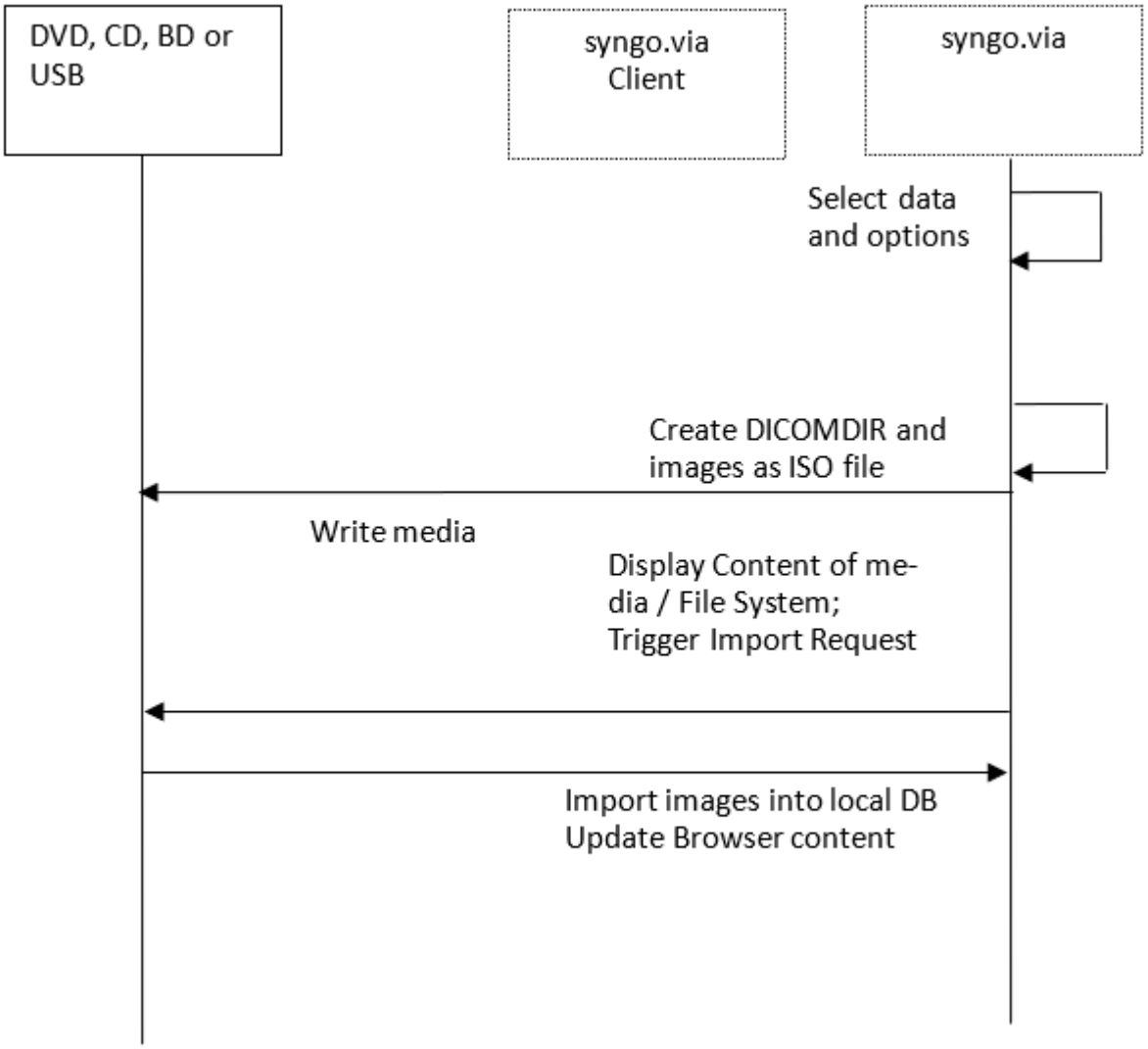
3.1.2 Functional definitions of AEs

The syngo.via 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.

3.1.3 Sequencing of Real-World Activities

Whenever data is written to an external media, ***syngo.via*** 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) General Purpose CD profile, DVD-J2K, BD-J2K profile is used.



-

Figure 10: Sequence Diagram – Media creation

3.1.4 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 69: Implementation Class/Version Name - Media Interchange

File Meta Information Version	0001
Implementation Class UID	1.3.12.2.1107.5.8.15.10.20090701
Implementation Version Name	*syngo.via*

3.2 AE SPECIFICATIONS

3.2.1 Media Storage AE – Specification

The ***syngo.via*** 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 70: 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	

3.2.1.1 Real-World Activities

3.2.1.1.1 Activity "Browse Directory Information"

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

3.2.1.1.2 Real World Activity "Import into Application"

The *syngo.via* 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 syngo.via can be retrieved from media.

3.2.1.1.3 Real-World Activity "Export to local Archive Media"

The syngo.via 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 software of *syngo.via* has not already processed the generated ISO file.
The syngo.via 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 syngo.via local configuration (if equipped with a local media burner) to burn the ISO file to the appropriate media.

3.2.1.2 SOP Classes and Transfer Syntaxes

These Application Profiles are based on the Media Storage Service Class with the Interchange Option. The syngo.via provides Standard Conformance to the SOP Classes listed in "Table 1: Network Services" section "SOP Classes Created by the syngo.via" and "SOP Classes Managed by the syngo.via" in the "Conformance Statement Overview".
In"Table 71: Transfer Syntaxes for STD-GEN-DVD-J2K, STD-GEN-BD-J2K and STD-GEN-USB-J2K" the Transfer Syntax UID "RLE Lossless "only applies for decompression.

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 71: 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.

3.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

3.3.1 Augmented Application Profiles

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

Table 72: 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.

3.4 MEDIA CONFIGURATION

None

4 Support of Extended Character Sets

The syngo.via DICOM application supports the following character sets as defined in the four tables below:

Table 73: 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 74: 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 75: 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 76: 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 ←→ (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in GB18030 ←→ (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in ISO 2022 ←→ (0008,0005) contains ISO_IR 192
- An attribute value is encoded in ISO 2022 ←→ (0008,0005) contains GB18030

An IOD that contains one of the above mentioned inconsistencies are 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 syngo.via supports Kanji characters in the byte zones after 74 (79, 7A, 7B and 7C).

5 Attribute confidentiality profiles

5.1 De-identification

The ***syngo.via*** 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 private attributes during de-identification:

- Full de-identification: private attributes are not included in anonymized studies
- Reduced de-identification: private attributes are not included in anonymized studies except for the tags listed in Table 78
- Service de-identification: all private attributes are included in anonymized studies

In the following table for attributes marked with:

- 'Yes' - data are anonymized
- 'No' - data are kept

Table 77: Application Level Confidentiality Profile attributes (standard tags)

DICOM Tag	Attribute Name	Full	Reduced	Service
(0000,1000)	Affected SOP Instance UID	Yes	Yes	No
(0000,1001)	Requested SOP Instance UID	Yes	Yes	No
(0002,0003)	Media Storage SOP Instance UID	Yes	Yes	No
(0004,1511)	Referenced SOP Instance UID in File	Yes	No	No
(0008,0014)	Instance Creator UID	Yes	Yes	No
(0008,0015)	Instance Coercion DateTime	Yes	No	No
(0008,0018)	SOP Instance UID	Yes	Yes	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

DICOM Tag	Attribute Name	Full	Reduced	Service
(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
(0008,0058)	Failed SOP Instance UID List	Yes	Yes	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	Yes	No
(0008,0201)	Time zone 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	Yes	No
(0008,1195)	Transaction UID	Yes	Yes	No
(0008,2111)	Derivation Description	Yes	No	No
(0008,2112)	Source Image Sequence	Yes	No	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0008,3010)	Irradiation Event UID	Yes	Yes	No
(0008,4000)	Identifying Comments	Yes	Yes	No
(0008,9123)	Creator Version UID	Yes	Yes	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
(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

DICOM Tag	Attribute Name	Full	Reduced	Service
(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	Yes	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	Yes	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	Yes	No
(0020,000E)	Series Instance UID	Yes	Yes	No
(0020,0010)	Study ID	Yes	Yes	No
(0020,0052)	Frame of Reference UID	Yes	Yes	No
(0020,0200)	Synchronization Frame of Reference UID	Yes	Yes	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	Yes	No
(0020,9164)	Dimension Organization UID	Yes	Yes	No
(0028,1199)	Palette Color Lookup Table UID	Yes	Yes	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0028,1214)	Large Palette Color Lookup Table UID	Yes	Yes	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
(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
(0040,000B)	Scheduled Performing Physician Identification Sequence	Yes	Yes	No
(0040,0010)	Scheduled Station Name	Yes	Yes	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(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
(0040,1004)	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
(0040,4010)	Scheduled Procedure Step Modification DateTime	Yes	No	No
(0040,4011)	Expected Completion Date Time	Yes	No	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(0040,4023)	Referenced General Purpose Scheduled Procedure Step Transaction UID	Yes	Yes	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	Yes	No
(0040, A172)	Referenced Observation UID (Trial)	Yes	Yes	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	Yes	No
(0040, A730)	Content Sequence	Yes	Yes	No
(0040, DB0C)	Template Extension Organization UID	Yes	Yes	No
(0040, DB0D)	Template Extension Creator UID	Yes	Yes	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(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	Yes	No
(0088,0140)	Storage Media Fileset UID	Yes	Yes	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	Yes	No
(3006,00C2)	Related Frame of Reference UID	Yes	Yes	No
(3008,0105)	Source Serial Number	Yes	No	No
(300A,0013)	Dose Reference UID	Yes	Yes	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

DICOM Tag	Attribute Name	Full	Reduced	Service
(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 78: 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 / phases	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 ID	Yes	No	No
(0035, SIEMENS MED NM, 05)	Phase ID	Yes	No	No
(0041, SIEMENS MED NM, 01)	Whole Body Tomo Position Index	Yes	No	No
(0041, SIEMENS MED NM, 02)	Whole Body Tomo Number of Positions	Yes	No	No
(0041, SIEMENS MED NM, 10)	Effective Emission Energy	Yes	No	No

DICOM Tag	Attribute Name	Full	Reduced	Service
(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
(0061, SIEMENS MED NM, 8D)	QSPECT 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

DICOM Tag	Attribute Name	Full	Reduced	Service
(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
(0071, SIEMENS MED PT, 23)	Registration Matrix	Yes	No	No
(0071, SIEMENS MED PT, 24)	Table Motion	Yes	No	No
(0071, SIEMENS MED PT, 25)	Lumped Constant	Yes	No	No
(0071, SIEMENS MED PT, 26)	Histogramming Method	Yes	No	No
(0071, SIEMENS MED PT MU MAP, 01)	SOP Class of Source	Yes	No	No
(0071, SIEMENS MED PT MU MAP, 02)	Related Mu Map Series	Yes	No	No

6 Security

6.1 Security Profiles

6.1.1 Time Synchronisation Profiles

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

6.1.2 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).

6.2 Association Level Security

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

6.3 Application Level Security

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

7 Annexes

7.1 IOD Contents

7.1.1 CT Derived object for LungCAD findings generated by syngo.via

Table 79: CT Derived object for LungCAD

Attribute	Tag	Type	Description
Specific Character Set	(0008, 0005)	1C	Copied from Input Image
Image Type	(0008,0008)	1	Value 1: DERIVED Value 2: SECONDARY Value 3: AXIAL Value 4: AlgorithmName_AlgorithmVersion_DO
Instance Creation Date	(0008,0012)	3	DO[1] instance creation date
Instance Creation Time	(0008,0013)	3	DO[1] instance creation time
SOP Class UID	(0008,0016)	1	Copied from Input Image
SOP Instance UID	(0008,0018)	1	1.3.12.2.1107.5.8.15. serialnumber. object_unique_identifier[2]
Study Date	(0008,0020)	2	Copied from Input Image
Series Date	(0008,0021)	3	Creation Date of the DO[1] in <YYYYMMDD> format
Acquisition Date	(0008,0022)	3	Copied from Input Image
Study Time	(0008,0030)	2	Copied from Input Image
Series Time	(0008,0031)	3	Creation Time of the DO[1] in <HHMMSS> format
Acquisition Time	(0008,0032)	3	Copied from Input Image
Accession Number	(0008,0050)	2	Copied from Input Image
Modality	(0008,0060)	1	Copied from Input Image
Manufacturer	(0008,0070)	2	Copied from Input Image
Institution Name	(0008,0080)	3	Copied from Input Image
Referring Physician's Name	(0008,0090)	2	Copied from Input Image
Study Description	(0008,1030)	3	Copied from Input Image
Series Description	(0008,103E)	3	Series description as configured by the application
Name Of Physician(s) Reading Study	(0008,1060)	3	Copied from Input Image
Manufacturer's Model Name	(0008,1090)	3	Copied from Input Image
Derivation description	(0008,2111)	3	Set AlgorithmName_AlgorithmVersion_DO value. For example: LUNGCAD_VD10C_DO)

Attribute	Tag	Type	Description
Source Image Sequence	(0008,2112)	3	Set input image SOP class UID and input image SOP instance UID from original image
>Reference SOP Class UID	(0008,1150)		From original image's SOP Class UID
>Reference SOP Instance UID	(0008.1155)		From original image's SOP Instance UID
Patient Name	(0010,0010)	2	Copied from Input Image
Patient ID	(0010,0020)	2	Copied from Input Image
Patient's Birth Date	(0010,0030)	2	Copied from Input Image
Patient's Sex	(0010,0040)	2	Copied from Input Image
Patient's Size	(0010,1020)	3	Copied from Input Image
Patient's Weight	(0010,1030)	3	Copied from Input Image
Pregnancy Status	(0010,21C0)	3	Copied from Input Image
Imager Pixel Spacing	(0018,1164)	3	Copied from Input Image
Patient Position	(0018,5100)	2C	Copied from Input Image
View Position	(0018,5101)	3	Copied from Input Image
Detector Element Physical Size	(0018,7020)	3	Copied from Input Image
Detector Element Spacing	(0018,7022)	3	Copied from Input Image
Study Instance UID	(0020,000D)	1	Copied from Input Image
Series Instance UID	(0020,000E)	1	1.3.12.2.1107.5.99.3.99. UID[2]
Study ID	(0020,0010)	2	Copied from Input Image
Series Number	(0020,0011)	2	Series Number as configured by the user
Patient Orientation	(0020,0020)	2	Copied from Input Image
Image Laterality	(0020,0062)	1	Copied from Input Image
Samples PerPixel	(0028,0002)	1	Copied from input image
Photometric Interpretation	(0028,0004)	1	Copied from input image
Rows	(0028,0010)	1	Copied from input image
Columns	(0028,0011)	1	Copied from input image
Pixel Spacing	(0028,0030)	1	Copied from input image
Bits Allocated	(0028,0100)	1	Copied from input image
Bits Stored	(0028,0101)	1	Copied from input image
High Bit	(0028,0102)	1	Copied from input image
Pixel Representation	(0028,0103)	1	Copied from input image
Window Centre	(0028,1050)	1	Copied from Input Image
Window Width	(0028,1051)	1	Copied from Input Image
Rescale Intercept	(0028,1052)	1	Copied from input image
Rescale Slope	(0028,1053)	1	Copied from input image

Attribute	Tag	Type	Description
Rescale Type	(0028,1054)	1	Copied from input image
Presentation Creator's Name	(0070,0084)	2	Algorithm Name_Version_DO[1]
Study Comments	(0032,4000)	3	Copied from input image
Pixel Data	(7FE0,0010)	1	Sets the Derived Pixel data

1 – Derived Object

*2 – UID generated by **syngo.via***

7.1.2 CT Grayscale image result of Perfusion Tasks

Table 80: CT Grayscale image result of CT Perfusion Tasks

DICOM - Storage as CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2 **Image Type (0008,0008) Value 1 to 4 in all these result volumes is: DERIVED\SECONDARY\AXIAL\CT_SOM8 PERF** **Photometric Interpretation = MONOCHROME2** **Bits allocated = 16(*) and Samples per Pixel = 1**							
Task / Body Region	**Calculation Model**	**Result Volumes - Full Name -**	**Image Type (0008,0008) - Value 5 -**	**Rescale Intercept (0028,1052)**	**Rescale Slope (0028,1053)**	**Rescale Type (0028,1054)**	**Proper unit is visible in the image comment (0020,4000)**
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Standard	Temporal MIP	MIP	-1024	1	HU	HU
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Standard	Temporal Average	AVG	-1024	1	HU	HU
CT Neuro Perfusion + CT Body Perfusion +	Standard	Baseline	BASE	-1024	1	HU	HU

DICOM - Storage as CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2 Image Type (0008,0008) Value 1 to 4 in all these result volumes is: DERIVED\SECONDARY\AXIAL\CT_SOM8 PERF Photometric Interpretation = MONOCHROME2 Bits allocated = 16(*) and Samples per Pixel = 1							
Task / Body Region	**Calculation Model**	**Result Volumes - Full Name -**	**Image Type (0008,0008) - Value 5 -**	**Rescale Intercept (0028,1052)**	**Rescale Slope (0028,1053)**	**Rescale Type (0028,1054)**	**Proper unit is visible in the image comment (0020,4000)**
CT Myocardial Perfusion							
CT Neuro Perfusion + CT Body Perfusion	Standard	Time to Start	TTSM	-102.4	0.1	US	s
CT Neuro Perfusion + CT Body Perfusion	Deconvolution	Time to Start	TTSD	-102.4	0.1	US	s
CT Neuro Perfusion + CT Body Perfusion	Standard	Time to Peak	TTPM	-102.4	0.1	US	s
CT Neuro Perfusion + CT Body Perfusion	Deconvolution	Time to Drain	TTDD	-102.4	0.1	US	s
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Deconvolution	Mean Transit Time	MTTD	-102.4	0.1	US	s
CT Neuro Perfusion + CT Body Perfusion	Deconvolution	TMax	TMAXD	-102.4	0.1	US	s
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Deconvolution	Flow Extraction Product	FED	-102.4	0.1	US	mL/100mL/min

DICOM - Storage as CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2

Image Type (0008,0008) Value 1 to 4 in all these result volumes is: DERIVED\SECONDARY\AXIAL\CT_SOM8 PERF

Photometric Interpretation = MONOCHROME2

Bits allocated = 16(*) and Samples per Pixel = 1

Task / Body Region	Calculation Model	Result Volumes - Full Name -	Image Type (0008,0008) - Value 5 -	Rescale Intercept (0028,1052)	Rescale Slope (0028,1053)	Rescale Type (0028,1054)	Proper unit is visible in the image comment (0020,4000)
CT Neuro Perfusion	Max. Slope	Cerebral Blood Flow	CBFM	-1024	1	US	mL/100mL/min
CT Neuro Perfusion	Deconvolution	Cerebral Blood Flow	CBFD	-1024	1	US	mL/100mL/min
CT Neuro Perfusion	Max. Enhancement	Cerebral Blood Volume	CBVM	-102.4	0.1	US	mL/100mL
CT Neuro Perfusion	Deconvolution	Cerebral Blood Volume	CBVD	-102.4	0.1	US	mL/100mL
CT Body Perfusion	Max. Slope	Blood Flow	BFM	-1024	1	US	mL/100mL/min
CT Body Perfusion	Deconvolution	Blood Flow	BFD	-1024	1	US	mL/100mL/min
CT Body Perfusion	Max. Enhancement	Blood Volume	BVM	-102.4	0.1	US	mL/100mL
CT Body Perfusion	Patlak	Blood Volume	BVP	-102.4	0.1	US	mL/100mL
CT Body Perfusion	Deconvolution	Blood Volume	BVD	-102.4	0.1	US	mL/100mL
CT Body Perfusion	Patlak	Flow Extraction Product	FEP	-102.4	0.1	US	mL/100mL/min
CT Body Perfusion	Patlak	Rsquare	RSQP	-1024	1	US	%

DICOM - Storage as CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2

Image Type (0008,0008) Value 1 to 4 in all these result volumes is: DERIVED\SECONDARY\AXIAL\CT_SOM8 PERF

Photometric Interpretation = MONOCHROME2

Bits allocated = 16(*) and Samples per Pixel = 1

Task / Body Region	Calculation Model	Result Volumes - Full Name -	Image Type (0008,0008) - Value 5 -	Rescale Intercept (0028,1052)	Rescale Slope (0028,1053)	Rescale Type (0028,1054)	Proper unit is visible in the image comment (0020,4000)
CT Body Perfusion	Patlak	Residuals	RSDP	-102.4	0.1	US	mL/100 mL
CT Body Perfusion	Liver Model	Arterial Liver Perfusion	ALP	-1024	1	US	mL/100 mL/min
CT Body Perfusion	Liver Model	Portal Venous Liver Perfusion	PVP	-1024	1	US	mL/100 mL/min
CT Body Perfusion	Liver Model	Hepatic Perfusion Index	HPI	-1024	1	US	mL/100 mL/min
CT Myocardial Perfusion	Max. Slope	Myocardial Blood Flow	MBF	-1024	1	US	mL/100 mL/min
CT Myocardial Perfusion	Max. Enhancement	Myocardial Blood Volume	MBV	-102.4	0.1	US	mL/100 mL
CT Myocardial Perfusion	Myocardial Deconvolution	Flow Extraction Product	FE	-102.4	0.1	US	mL/100 mL
CT Myocardial Perfusion	Myocardial Deconvolution	Perfused Capillary Blood Volume	PCBV	-102.4	0.1	US	s
CT Myocardial Perfusion	Myocardial Deconvolution	Myocardial Blood Flow Corrected	MBFC	-1024	1	US	mL/100mL
CT Myocardial Perfusion	Myocardial Deconvolution	Extravascular Extracellular Volume	EEV	-102.4	0.1	US	mL/100mL
CT Myocardial Perfusion	Myocardial Deconvolution	Time to Peak	TTP	-102.4	0.1	US	s

DICOM - Storage as CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2 Image Type (0008,0008) Value 1 to 4 in all these result volumes is: DERIVED\SECONDARY\AXIAL\CT_SOM8 PERF Photometric Interpretation = MONOCHROME2 Bits allocated = 16(*) and Samples per Pixel = 1							
Task / Body Region	**Calculation Model**	**Result Volumes - Full Name -**	**Image Type (0008,0008) - Value 5 -**	**Rescale Intercept (0028,1052)**	**Rescale Slope (0028,1053)**	**Rescale Type (0028,1054)**	**Proper unit is visible in the image comment (0020,4000)**
CT Myocardial Perfusion	Myocardial Deconvolution	Time to Start	TTS	-102.4	0.1	US	mL/100mL/min
CT Myocardial Perfusion	Myocardial Deconvolution	Tissue Transit Time	TTT	-102.4	0.1	US	mL/100mL/min

Table 81: Enhanced CT image result of CT Perfusion Tasks

DICOM - Storage as Enhanced CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2.1 **Image Type (0008,0008) and Frame Type (0008,9007) Value 1 to 3 in all these result volumes is: DERIVED\PRIMARY\PERFUSION** **Photometric Interpretation = MONOCHROME2** **Bits allocated = 16(*) and Samples per Pixel = 1**									
Task / Body Region	**Calculation Model**	**Result Volumes - Full Name -**	**Image Type (0008,0008) - Value 4 - Frame Type (0008,9007) - Value 4 - LUT Label (0040,9210)**	**Rescale Intercept (0028,1052) contained in (5200,9229) Sequence**	**Rescale Slope (0028,1053) contained in (5200,9229) Sequence**	**Rescale Type (0028,1054) contained in (5200,9229) Sequence**	**RWVM Intercept (0040,9224)**	**RWVM Slope (0040,9225)**	**Code Meaning (0008,0104)**
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Standard	Temporal MIP	MIP	-1024	1	HU	-1024	1	HU
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Standard	Temporal Average	AVG	-1024	1	HU	-1024	1	HU
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Standard	Baseline	BASE	-1024	1	HU	-1024	1	HU
CT Neuro Perfusion + CT Body Perfusion	Standard	Time to Start	TTSM	-102.4	0.1	US	-102.4	0.1	s

DICOM - Storage as Enhanced CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2.1
Image Type (0008,0008) and Frame Type (0008,9007) Value 1 to 3 in all these result volumes is: DERIVED\PRIMARY\PERFUSION

Photometric Interpretation = MONOCHROME2

Bits allocated = 16(*) and Samples per Pixel = 1

Task / Body Region	Calculation Model	Result Volumes - Full Name -	Image Type (0008,0008) - Value 4 - Frame Type (0008,9007) - Value 4 - LUT Label (0040,9210)	Rescale Intercept (0028,1052) contained in (5200,9229) Sequence	Rescale Slope (0028,1053) contained in (5200,9229) Sequence	Rescale Type (0028,1054) contained in (5200,9229) Sequence	RWVM Intercept (0040,9224)	RWVM Slope (0040,9225)	Code Meaning (0008,0104)
CT Neuro Perfusion + CT Body Perfusion	Deconvolution	Time to Start	TTSD	-102.4	0.1	US	-102.4	0.1	s
CT Neuro Perfusion + CT Body Perfusion	Standard	Time to Peak	TTPM	-102.4	0.1	US	-102.4	0.1	s
CT Neuro Perfusion + CT Body Perfusion	Deconvolution	Time to Drain	TTDD	-102.4	0.1	US	-102.4	0.1	s
CT Neuro Perfusion + CT Body Perfusion + CT Myocardial Perfusion	Deconvolution	Mean Transit Time	MTTD	-102.4	0.1	US	-102.4	0.1	s
CT Neuro Perfusion + CT Body Perfusion	Deconvolution	TMax	TMAXD	-102.4	0.1	US	-102.4	0.1	s
CT Neuro Perfusion + CT Body Perfusion +	Deconvolution	Flow Extraction Product	FED	-102.4	0.1	US	-102.4	0.1	mL/100 mL/min

DICOM - Storage as Enhanced CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2.1
Image Type (0008,0008) and Frame Type (0008,9007) Value 1 to 3 in all these result volumes is: DERIVED\PRIMARY\PERFUSION

Photometric Interpretation = MONOCHROME2

Bits allocated = 16(*) and Samples per Pixel = 1

Task / Body Region	Calculation Model	Result Volumes - Full Name -	Image Type (0008,0008) - Value 4 - Frame Type (0008,9007) - Value 4 - LUT Label (0040,9210)	Rescale Intercept (0028,1052) contained in (5200,9229) Sequence	Rescale Slope (0028,1053) contained in (5200,9229) Sequence	Rescale Type (0028,1054) contained in (5200,9229) Sequence	RWVM Intercept (0040,9224)	RWVM Slope (0040,9225)	Code Meaning (0008,0104)
CT Myocardial Perfusion									
CT Neuro Perfusion	Max. Slope	Cerebral Blood Flow	CBFM	-1024	1	US	-1024	1	mL/100 mL/min
CT Neuro Perfusion	Deconvolution	Cerebral Blood Flow	CBFD	-1024	1	US	-1024	1	mL/100 mL/min
CT Neuro Perfusion	Max. Enhancement	Cerebral Blood Volume	CBVM	-102.4	0.1	US	-102.4	0.1	mL/100 mL
CT Neuro Perfusion	Deconvolution	Cerebral Blood Volume	CBVD	-102.4	0.1	US	-102.4	0.1	mL/100mL
CT Body Perfusion	Max. Slope	Blood Flow	BFM	-1024	1	US	-1024	1	mL/100mL/min
CT Body Perfusion	Deconvolution	Blood Flow	BFD	-1024	1	US	-1024	1	mL/100mL/min
CT Body Perfusion	Max. Enhancement	Blood Volume	BVM	-102.4	0.1	US	-102.4	0.1	mL/100mL
CT Body Perfusion	Patlak	Blood Volume	BVP	-102.4	0.1	US	-102.4	0.1	mL/100mL
CT Body Perfusion	Deconvolution	Blood Volume	BVD	-102.4	0.1	US	-102.4	0.1	mL/100mL

DICOM - Storage as Enhanced CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2.1
Image Type (0008,0008) and Frame Type (0008,9007) Value 1 to 3 in all these result volumes is: DERIVED\PRIMARY\PERFUSION

Photometric Interpretation = MONOCHROME2

Bits allocated = 16(*) and Samples per Pixel = 1

Task / Body Region	Calculation Model	Result Volumes - Full Name -	Image Type (0008,0008) - Value 4 - Frame Type (0008,9007) - Value 4 - LUT Label (0040,9210)	Rescale Intercept (0028,1052) contained in (5200,9229) Sequence	Rescale Slope (0028,1053) contained in (5200,9229) Sequence	Rescale Type (0028,1054) contained in (5200,9229) Sequence	RWVM Intercept (0040,9224)	RWVM Slope (0040,9225)	Code Meaning (0008,0104)
CT Body Perfusion	Patlak	Flow Extraction Product	FEP	-102.4	0.1	US	-102.4	0.1	mL/100mL/min
CT Body Perfusion	Patlak	Rsquare	RSQP	-1024	1	US	-1024	1	%
CT Body Perfusion	Patlak	Residuals	RSDP	-102.4	0.1	US	-102.4	0.1	mL/100mL
CT Body Perfusion	Liver Model	Arterial Liver Perfusion	ALP	-1024	1	US	-1024	1	mL/100mL/min
CT Body Perfusion	Liver Model	Portal Venous Liver Perfusion	PVP	-1024	1	US	-1024	1	mL/100 mL/min
CT Body Perfusion	Liver Model	Hepatic Perfusion Index	HPI	-1024	1	US	-1024	1	mL/100 mL/min
CT Myocardial Perfusion	Max. Slope	Myocardial Blood Flow	MBF	-1024	1	US	-1024	1	mL/100 mL/min
CT Myocardial Perfusion	Max. Enhancement	Myocardial Blood Volume	MBV	-102.4	0.1	US	-102.4	0.1	mL/100 mL
CT Myocardial Perfusion	Myocardial Deconvolution	Flow Extraction Product	FE	-102.4	0.1	US	-102.4	0.1	mL/100 mL

DICOM - Storage as Enhanced CT Image , SOP Class UID = 1.2.840.10008.5.1.4.1.1.2.1
Image Type (0008,0008) and Frame Type (0008,9007) Value 1 to 3 in all these result volumes is: DERIVED\PRIMARY\PERFUSION

Photometric Interpretation = MONOCHROME2

Bits allocated = 16(*) and Samples per Pixel = 1

Task / Body Region	Calculation Model	Result Volumes - Full Name -	Image Type (0008,0008) - Value 4 - Frame Type (0008,9007) - Value 4 - LUT Label (0040,9210)	Rescale Intercept (0028,1052) contained in (5200,9229) Sequence	Rescale Slope (0028,1053) contained in (5200,9229) Sequence	Rescale Type (0028,1054) contained in (5200,9229) Sequence	RWVM Intercept (0040,9224)	RWVM Slope (0040,9225)	Code Meaning (0008,0104)
CT Myocardial Perfusion	Myocardial Deconvolution	Perfused Capillary Blood Volume	PCBV	-102.4	0.1	US	-102.4	0.1	s
CT Myocardial Perfusion	Myocardial Deconvolution	Myocardial Blood Flow Corrected	MBFC	-1024	1	US	-1024	1	mL/100 mL
CT Myocardial Perfusion	Myocardial Deconvolution	Extravascular Extracellular Volume	EEV	-102.4	0.1	US	-102.4	0.1	mL/100 mL
CT Myocardial Perfusion	Myocardial Deconvolution	Time to Peak	TTP	-102.4	0.1	US	-102.4	0.1	s
CT Myocardial Perfusion	Myocardial Deconvolution	Time to Start	TTS	-102.4	0.1	US	-102.4	0.1	mL/100 mL/min
CT Myocardial Perfusion	Myocardial Deconvolution	Tissue Transit Time	TTT	-102.4	0.1	US	-102.4	0.1	mL/100 mL/min

**16 bits allocated, 12 bits stored with high bit 11.*

7.1.3 CT Colour image result of Perfusion Tasks

The application extends the CT Image IOD by using the RGB color image description with the unsigned integer, 24-bit color image plane pixel format:

- Samples per pixel (attribute 0028, 0002) = 3
- Photometric interpretation (attribute 0028,0004) = "RGB"
- Pixel representation (attribute 0028, 0103) = 0
- Bits allocated (attribute 0028, 0100) = 8
- Bits stored (attribute 0028,0101) = 8
- High bit (attribute 0028,0102) = 7
- Planar configuration (attribute 0028,0006) = 0.

This format is used for Functional Imaging, that is, images that meaningfully use all common CT Image attributes. However, the pixel values do not represent a scaled Hounsfield value but a different value (depending on the type of image).

7.1.4 Segmentation Properties

The following table lists the default values for attributes for segmentation objects.

Table 82: Attributes for segmentation objects

Attribute Name	Tag	Value
Segmented Property Category Code Sequence	(0062,0003)	
Code Value	(0008,0100)	SRT
Coding Scheme Designator	(0008,0102)	T-D0050
Code Meaning	(0008,0104)	Tissue
Segmented Property Type Code Sequence	(0062,000F)	
Code Value	(0008,0100)	SRT
Coding Scheme Designator	(0008,0102)	T-D0050
Code Meaning	(0008,0104)	Tissue

7.1.5 Data Dictionary of Private Attributes

Table 83: Private Data Element Dictionary lists all private attributes created by ***syngo.via*** which may be included in the generated instances. These private attributes may be deprecated or replaced with standard attributes in the future.

Table 83: 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

DICOM Tag	Name	VR	VM
(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

DICOM Tag	Name	VR	VM
(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
(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

DICOM Tag	Name	VR	VM
(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

DICOM Tag	Name	VR	VM
(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 Arrow Tip 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 Colour	DS	4

DICOM Tag	Name	VR	VM
(0029, SIEMENS SYNGO ADVANCED PRESENTATION,55)	Renderer DirectionalLight Direction	DS	3
(0029, SIEMENS SYNGO ADVANCED PRESENTATION,56)	Renderer DirectionalLight two side 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 Colour	DS	0-n
(0029, SIEMENS SYNGO ADVANCED PRESENTATION,5A)	Renderer Is Camera Required Flag	CS	1
(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

DICOM Tag	Name	VR	VM
(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

DICOM Tag	Name	VR	VM
(0029, SIEMENS SYNGO ADVANCED PRESENTATION,84)	Camera Rotation Centre	DS	3
(0029, SIEMENS SYNGO ADVANCED PRESENTATION,85)	Camera Rotation Centre 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
(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

DICOM Tag	Name	VR	VM
(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

DICOM Tag	Name	VR	VM
(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 Centre	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CB)	Clip Plane Normal	DS	3
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,CC)	Clip Plane Scale	DS	2

DICOM Tag	Name	VR	VM
(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
(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

DICOM Tag	Name	VR	VM
(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
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,06)	Measurement Roi Binary Mask	UT	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,08)	Segmentation Double Threshold	DS	1
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,09)	Serialized Custom Attributes	UT	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

DICOM Tag	Name	VR	VM
(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
(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

DICOM Tag	Name	VR	VM
(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

DICOM Tag	Name	VR	VM
(0009,SIEMENS SYNGO INDEX SERVICE,88)	Given Name	LO	1
(0009,SIEMENS SYNGO INDEX SERVICE,89)	Middle Name	LO	1
(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

DICOM Tag	Name	VR	VM
(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
(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

DICOM Tag	Name	VR	VM
(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

DICOM Tag	Name	VR	VM
(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
(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

DICOM Tag	Name	VR	VM
(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 Colour	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,03)	Fill Foreground Colour	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 Colour	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,08)	Line Foreground Colour	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 Colour	FL	4
(0071,SIEMENS SYNGO OBJECT GRAPHICS,15)	Stipple Pattern	DS	1
(0071,SIEMENS SYNGO OBJECT GRAPHICS,16)	Line Anti Aliasing	DS	1

DICOM Tag	Name	VR	VM
(0071,SIEMENS SYNGO OBJECT GRAPHICS,17)	Line-Z-Blend Flag	CS	1
(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 Colour	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

DICOM Tag	Name	VR	VM
(0071,SIEMENS SYNGO OBJECT GRAPHICS,48)	Axis Tick Behaviour	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 Centre 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
(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

DICOM Tag	Name	VR	VM
(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

DICOM Tag	Name	VR	VM
(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
(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

DICOM Tag	Name	VR	VM
(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
(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

DICOM Tag	Name	VR	VM
(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 S TREAMING,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

DICOM Tag	Name	VR	VM
(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

Interpretation of the DICOM Tags from the above table:
(gggg, pp,ee) -> (gggg, pp, ee)
gggg - odd group number
pp - private creator identification code
ee - private element

7.1.6 Usage of Attributes from received IODs

N/A

7.1.7 Attribute mapping

There is currently no mapping from attributes received in DICOM Modality Worklist to other attributes.

7.1.8 Coerced / Modified fields

N/A

7.2 Coded Terminology and Templates

See application specific annexes.

7.2.1 Context Groups

See application specific annexes.

7.2.2 Template Specifications

See application specific annexes.

7.2.3 Private Code definitions

See application specific annexes.

7.3 Grayscale Image Consistency

N/A

7.4 Standard Extended / Specialized / Private SOP Classes

N/A

7.5 Private Transfer Syntaxes

No private Transfer Syntaxes are defined for or requested by syngo.via DICOM application.

7.6 DICOM Print SCU – detailed status displays

The following tables document the behavior of the syngo.via 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.

7.6.1 Common Status Information

Table 84: 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	Self-calibration. Please wait.	<None>/idle

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
	available for normal operation shortly.		
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
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 PAPR	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

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
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 PAPR	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 PAPR	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 PAPR	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 PAPR	The 14x14 inch paper supply magazine is empty.	14x14 paper supply empty.	<None>/interact
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

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
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

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
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
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

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/ 'camera symbol'
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
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

7.6.2 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 syngo.via shall be flexible.

If any other printer status info or execution status info is received (as described in Table 84 syngo.via will react as shown in the following table:

Table 85: 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

7.7 syngo.Breast Care

7.7.1 *syngo*.Breast Care

The **syngo.Breast** Care application allows reviewing and reporting on mammography and breast tomosynthesis images.

7.7.1.1 SOP Specific Conformance to Viewing Application

The following SOP classes are recognized and displayed by the *syngo*.Breast Care software:

- Digital Mammography Image Storage – For Presentation: 1.2.840.10008.5.1.4.1.1.1.2

  The following constraints must be met in order to recognize images as digital mammography:

Table 86: Requirements for Mammography Images

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.1.2"
Patient orientation	(0020,0020)	Must be present and valid.

- Breast Tomosynthesis Images encoded as CT Image Storage: 1.2.840.10008.5.1.4.1.1.2

  The following constraints must be met in order to recognize images as breast tomosynthesis slices:

Table 87: Requirements for Breast Tomosynthesis Images encoded as CT

Attribute Name	Tag	Constraint (case insensitive)
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.2"
Manufacturer	(0008,0070)	Value = "Siemens" or value = "Hologic, Inc"

Attribute Name	Tag	Constraint (case insensitive)
Manufacturer's model name	(0008,1090)	For manufacturer „Siemens“: Value = “MAMMOMAT Inspiration” or value = “MAMMOMAT Revelation” For manufacturer “Hologic, Inc.”: Value = “Selenia Dimensions”
Series Instance UID	(0020,000E)	Must unambiguously identify one volume, i.e. multiple volumes in one series are not supported.
Image orientation	(0020,0037)	Must be present and valid.

- Breast Tomosynthesis Image Storage: 1.2.840.10008.5.1.4.1.1.13.1.3

  Only data with Frame Anatomy Macro (which includes the Frame Laterality) in Shared Functional Group (i.e. not in Per Frame Functional Group) are supported.
  For volumes, all frames contained must build exactly one volume, i.e. multiple volumes in one instance are not supported.
  The following constraints must be met in order to recognize images as GENERATED_2D mammography:

Table 88: Requirements for GENERATED_2D Mammography (Standard)

Attribute Name	Tag	Constraint (case insensitive)
Image Type	(0008,0008)	Value 3 = TOMOSYNTHESIS Value 4 = GENERATED_2D
SOP class UID	(0008,0016)	Value = “1.2.840.10008.5.1.4.1.1.13.1.3”
Number Of Frames	(0028,0008)	Value = “1”

Table 89: Requirements for GENERATED_2D Mammography (Hologic C-View)

Attribute Name	Tag	Constraint (case insensitive)
SOP class UID	(0008,0016)	Value = “1.2.840.10008.5.1.4.1.1.13.1.3”
Manufacturer	(0008,0070)	Value = “HOLOGIC, Inc.”
Manufacture's model name	(0008,1090)	Value = “Selenia Dimensions”
Series Description	(0008,103E)	Value contains “C-View”
Series Number	(0020,0011)	Value = “73300000”
Number Of Frames	(0028,0008)	Value = “1”

Otherwise, the following constraints must be met in order to recognize images as breast tomosynthesis slices:

Table 90: Requirements for DICOM Breast Tomosynthesis Images

Attribute Name	Tag	Constraint (case insensitive)
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.13.1.3"

For the three SOP classes Digital Mammography Image Storage – For Presentation, Breast Tomosynthesis Images encoded as CT Image Storage and Breast Tomosynthesis Image Storage, the following constraints must be met:

Table 91: Common Requirements for Mammography and Breast Tomosynthesis Images

Attribute Name	Tag	Constraint (case insensitive)
Pixel representation	(0028,0103)	Value = 0
Bits allocated	(0028,0100)	Value = 8 or value = 16
High bit	(0028,0102)	Bits stored in {8, 10, 12, 14, 15, 16} and bits stored = high bit + 1
Bits stored	(0028,0101)	
Samples per pixel	(0028,0002)	Value = 1
Photometric interpretation	(0028,0004)	Value = "MONOCHROME1" or Value = "MONOCHROME2"

Only image data meeting all requirements is displayed correctly. If any constraints are violated, the image data may not be automatically displayed, displayed with reduced information or not be displayed at all. In this case a warning message is displayed to the user.

- Mammography CAD SR: 1.2.840.10008.5.1.4.1.1.88.50

The following constraints must be met in order to recognize images as mammography computer-aided detection structured reports:

Table 92: Requirements for Mammography CAD SR

Attribute Name	Tag	Constraint (case insensitive)
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.88.50"
Manufacturer	(0008,0070)	Supported values: "SIEMENS", "iCAD, Inc.", "VuCOMP", "R2 Technology, Inc.", "ScreenPoint Medical"
Software Version(s)	(0018,1020)	The following software versions are supported per manufacturer: "SIEMENS": "syngo MammoCAD" "iCAD, Inc.": "7.2-H+", "Premier-D" "VuCOMP": "CAD 2.0.0.0", "CAD 2.1.0.0" "R2 Technology, Inc.": "1.5.1.5", "1.2.0.27", "1.5.0.43", "2.1.0.30" "ScreenPoint Medical": "1.2.1", "Transpara 1.4.0", "Transpara 1.6.0" or higher compatible versions

CAD structured reports of manufacturers or other software versions of the listed manufacturers may or may not be displayed correctly. A warning message is not displayed to the user in this case.
For CAD SRs meeting these constraints, only those single image findings are displayed that meet the following constraints:

Table 93: CAD SRs and Constraint

Concept Name	Code Sequence	Constraint (case insensitive)
Single Image Finding	EV (111059, DCM, "Single Image Finding")	Supported values: EV (F-01775, SRT, "Calcification Cluster") EV (F-01775, SRT 1.1, "Calcification Cluster") EV (F-01796, SRT, "Mammography breast density ") EV (F-01796, SRT 1.1, "Mammography breast density") EV (F-01776, SRT, "Individual Calcification") (Only if not part of a calcification cluster) EV (F-01776, SRT 1.1, "Individual Calcification") (Only if not part of a calcification cluster) EV (F-01710, SRT, "Breast Composition") (regardless of rendering intent) EV (DS-1, 99-SCREENPOINTMED, "Decision Support Finding") EV (DS-2, 99-SCREENPOINTMED, "Decision Support Alias Finding")
Rendering Intent	EV (111056, DCM, "Rendering Intent")	Value = EV (111150, DCM, "Presentation Required: Rendering device is expected to present") if single image finding is not one of EV (F-01710, SRT, "Breast Composition"), EV (DS-1, 99-SCREENPOINTMED, "Decision Support Finding") or EV (DS-2, 99-SCREENPOINTMED, "Decision Support Alias Finding")
Outline	EV (111041, DCM, "Outline")	For the following EV the outline may or may not be present: EV (F-01710, SRT, "Breast Composition") EV (F-01775, SRT, "Calcification Cluster") EV (F-01775, SRT 1.1, "Calcification Cluster") For other single image findings, the value must be present and contain at least one point.

7.7.1.2 IOD Contexts for Image Text

The following information is displayed as image text, if present.
The specified data is mandatory or optional as defined by the DICOM standard. For not available data attributes, either nothing or "n./a." is displayed in the image text.

Table 94: DICOM Tags used for Image Text

Attribute / Concept Name	Tag / Code Sequence	Comment
Acquisition Date and Time		
Acquisition Date	(0008,0022)	Fallback: Study date and time.
Acquisition Time	(0008,0032)	
Study Date	(0008,0020)	Displayed if acquisition date and time are not set. In this case, a disclaimer message is also displayed.
Study Time	(0008,0030)	
Patient and Study Data		
Accession Number	(0008,0050)	
Institution Name	(0008,0080)	
Institution Address	(0008,0081)	
Station Name	(0008,1010)	
Patient's Name	(0010,0010)	
Patient ID	(0010,0020)	
Patient's Birth Date	(0010,0030)	
Patient's Age	(0010,1010)	
Image Acquisition		
Manufacturer	(0008,0070)	
Operator's Name	(0008,1070)	
Manufacturer's Model Name	(0008,1090)	
KVP	(0018,0060)	
Gantry ID	(0018,1008)	
Device Serial Number	(0018,1000)	
Exposure Time	(0018,1150)	
Exposure	(0018,1152)	
Software Versions	(0018,1020)	
Anode Target Material	(0018,1191)	
Body Part Thickness	(0018,11A0)	
Compression Force	(0018,11A2)	
Relative X-ray Exposure	(0018,1405)	
Positioner Primary Angle	(0018,1510)	

Attribute / Concept Name	Tag / Code Sequence	Comment
Sensitivity	(0018,6000)	
Detector ID	(0018,700A)	
Date of Last Detector Calibration	(0018,700C)	
Filter Material	(0018,7050)	
Image Comment	(0020,4000)	
Organ Dose	(0040,0316)	
Entrance Dose in mGy	(0040,8302)	
View and Laterality		
View	(0054,0220)	If the view (0054,0220) or view code modifier sequence (0054,0222) contain invalid values, the view type may be displayed as "?".
View Code Modifier Sequence	(0054,0222)	If the view (0054,0220) or view code modifier sequence (0054,0222) contain invalid values, the view type may be displayed as "?".
Image Laterality	(0020,0062)	If one of these tags is present but contains an invalid value, the software may fall back to unpaired ("U").
Laterality	(0020,0060)	
Lookup Tables		
LUT Explanation	(0028,3003)	Only one of both is used, depending on which LUT is used.
Window Explanation	(0028,1055)	
Window Center	(0028,1050)	
Window Width	(0028,1051)	
Measurements		
Imager Pixel Spacing	(0018,1164)	Used for display of resolution and magnification factor. Variant A: If estimated radiographic magnification factor (0018,1114) is not available, distance source to patient (0018,1111) and detector (0018,1110) is used.
Estimated Radiographic Magnification Factor	(0018,1114)	
Distance Source to Patient	(0018,1111)	
Distance Source to Detector	(0018,1110)	
Pixel Spacing	(0028,0030)	Used for display of resolution and magnification factor. Variant B: Used if variant A fails.
Image Plane Pixel Spacing	(3002,0011)	Used for display of resolution and magnification factor. Variant C: Used if variants A and B fail.
Breast Tomosynthesis		
Derivation Description	(0008,2111)	

Attribute / Concept Name	Tag / Code Sequence	Comment
Number of Frames	(0028,0008)	Used for display of total number of slices.
Frame Laterality	(0020,9072)	
Computer-Aided Detection		
Manufacturer	(0008,0070)	Manufacturer of CAD SR
Software Version(s)	(0018,1020)	Software versions of CAD software which generated the CAD SR
Content Date	(0008,0023)	Content date of CAD SR
Content Time	(0008,0033)	Content time of CAD SR
Algorithm Name	EV(111001, DCM, "Algorithm Name")	Algorithm names of the displayed single image findings.
Algorithm Version	EV (111003, DCM, "Algorithm Version")	Algorithm versions of the displayed single image findings.
Breast Composition	EV (F-01710,SRT, "Breast composition")	Breast composition value of the breast composition single image finding (if present).
Glandular Tissue	EV (111046, DCM, "Percent Fibroglandular Tissue")	Glandular tissue value of the breast composition single image finding (if present).
Summary of Detections	EV (111064, DCM, "Summary of Detections ")	
Summary of Analyses	EV (111065, DCM, "Summary of Analyses ")	
Area	EV (G-A166, SNM3, „Area ")	If present for single image finding.
Long Axis	EV (G-A185, SNM3, "Long Axis")	If present for single image finding.
Number of Calcifications	EV (111038, DCM, "Number of Calcifications")	For calcification clusters, if present for single image finding.
Certainty of Finding	EV (111012, DCM, "Certainty of Finding")	If present for single image finding.

Attribute / Concept Name	Tag / Code Sequence	Comment
Distance from Nipple	EV (121242, DCM, "Distance from Nipple ")	If present for single image finding.
Distance from Chest Wall	EV (121244", "DCM", " Distance from Chest Wall")	If present for single image finding.
Breast Density		
Density Grade	EV (F-01710, SRT, "Breast Composition")	a: F-01711, SRT, "Almost entirely fat" b: F-01712, SRT, "Scattered fibroglandular densities" c: F-01713, SRT, "Heterogeneously dense" d: F-01714, SRT, "Extremely dense"
Fibroglandular Tissue	EV (112192, DCM, "Volume of Parenchymal Tissue")	
Breast Tissue Density	EV (112191, DCM, "Breast Tissue Density")	
Decision Support		
Transpara Score	EV (111033, DCM, "Impression Description")	Always has the value "Transpara Score: <score>"
	(5363,1005)	Used for display of Transpara Score in syngo.via PatientBrowser.
Contrast Enhanced Mammography		
Contrast/Bolus Volume	(0018,1041)	
Contrast Flow Rate	(0018,1046)	
Time Since Injection	(0018,1042)	Calculated by subtracting "contrast / bolus start time" from "acquisition time"
Tomo Biopsy		
Target Position	(0018,2044)	
Target Label	(0018,2045)	

7.8 MAMMOVISTA

7.8.1 MAMMOVISTA B.smart Application

The MAMMOVISTA B.smart application allows reviewing and reporting on mammography and breast tomosynthesis images.

7.8.1.1 SOP Specific Conformance to Viewing Application

The following SOP classes are written and recognized by the MM BreastReading Application (in the following "MMBR"):

- Basic Text Structured Reports: 1.2.840.10008.5.1.4.1.1.88.11.

The specified data is mandatory or optional as defined by the DICOM standard. This data contains proprietary information.
MMBR recognizes this data using the Series Description, which has to be set to "MMBR Measurement Reanimation Data".

- Secondary Capture Images of Measurement and Segment Snapshots: 1.2.840.10008.5.1.4.1.1.7.

The specified data is mandatory or optional as defined by the DICOM standard.
The following SOP classes are recognized by the MMBR software:

- Digital Mammography Image Storage - For Presentation: 1.2.840.10008.5.1.4.1.1.1.2
- Magnetic Resonance Images: 1.2.840.10008.5.1.4.1.1.4
- Enhanced MR Image Storage: 1.2.840.10008.5.1.4.1.1.4.1
- Breast Tomosynthesis Images encoded as CT Image Storage: 1.2.840.10008.5.1.4.1.1.2
- Breast Tomosynthesis Image Storage: 1.2.840.10008.5.1.4.1.1.13.1.3
- Ultrasound Image Storage: 1.2.840.10008.5.1.4.1.1.6.1
- Ultrasound Multi-frame Image Storage: 1.2.840.10008.5.1.4.1.1.3.1
- Mammography CAD SR: 1.2.840.10008.5.1.4.1.1.88.50
- Grayscale Softcopy Presentation States: 1.2.840.10008.5.1.4.1.1.11.1

It is possible that SOP classes which are not listed above will be displayed as "Unsupported" images.
On the following pages, the recognized SOP classes are shown in detail.

- Digital Mammography Image Storage - For Presentation: 1.2.840.10008.5.1.4.1.1.1.2.

The following constraints must be met in order to recognize images as digital mammography:

Table 95: Requirements for Mammography Images

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.1.2"
Patient orientation	(0020,0020)	Must be present and valid.
Imager Pixel Spacing	(0018,1164)	Must be quadratic.
Pixel Spacing	(0028,0030)	If present: must be quadratic.

- Magnetic Resonance Images: 1.2.840.10008.5.1.4.1.1.4.

  The following constraints must be met in order to recognize images as magnetic resonance image:

Table 96: Requirements for Magnetic Resonance (MR) Images

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.4"
Pixel Spacing	(0028,0030)	If present: must be quadratic.

  - Enhanced MR Image Storage: 1.2.840.10008.5.1.4.1.1.4.

  The following constraints must be met in order to recognize images as enhanced magneticresonance image:

Table 97: Requirements for Enhanced MR Images

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.4.1"
Pixel Spacing	(0028,0030)	If present: must be quadratic.

- Breast Tomosynthesis Images encoded as CT Image Storage: 1.2.840.10008.5.1.4.1.1.2

  The following constraints must be met in order to recognize images as breast tomosynthesis slices:

Table 98: Requirements for Breast Tomosynthesis Images encoded as CT

Attribute Name	Tag	Constraint (case insensitive)
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.2"
Modality	(0008,0060)	Value = "CT"
Manufacturer	(0008,0070)	Value = "SIEMENS" " or value = "Hologic, Inc."
Image Type	(0008,0008)	For manufacturer "Hologic, Inc.": Value contains "Tomo"

Attribute Name	Tag	Constraint (case insensitive)
Manufacture's model name	(0008,1090)	For manufacturer "Siemens:" Value = "MAMMOMAT Inspiration" or value = "MAMMOMAT Revelation" For manufacturer "Hologic, Inc.": Value = "Selenia Dimensions"
Series Instance UID	(0020,000E)	Must unambiguously identify one volume, i.e. multiple volumes in one series are not supported.
Image orientation	(0020,0037)	Must be present and valid.
Software Version(s)	(0018,1020)	For manufacturer "Siemens" and manufacture's model name "Mammomat Inspiration": If Value < "VB41A" position related tools are disabled

- Breast Tomosynthesis Image Storage: 1.2.840.10008.5.1.4.1.1.13.1.3

  Only data with Frame Anatomy Macro (which includes the Frame Laterality) in Shared Functional Group (i.e., not in Per Frame Functional Group) are supported.
  For volumes, all frames contained must build exactly one volume, i.e. multiple volumes in one instance are not supported.
  The following constraints must be met in order to recognize images as GENERATED_2D mammography:

Table 99: Requirements for GENERATED_2D Mammography (Standard)

Attribute Name	Tag	Constraint
Image Type	(0008,0008)	Value 3 = TOMOSYNTHESIS Value 4 = GENERATED_2D
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.13.1.3"
Number Of Frames	(0028,0008)	Value = "1"

Table 100: Requirements for GENERATED_2D Mammography (Hologic C-View)

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.13.1.3"
Manufacturer	(0008,0070)	Value = "HOLOGIC, Inc."
Manufacture's model name	(0008,1090)	Value = "Selenia Dimensions"
Series Description	(0008,103E)	Value contains "C-View"
Series Number	(0020,0011)	Value = "73300000"

Attribute Name	Tag	Constraint
Number Of Frames	(0028,0008)	Value = "1"

Otherwise, the following constraints must be met in order to recognize images as breasttomosynthesis slices:

Table 101: Requirements for Breast Tomosynthesis Images

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.13.1.3"

For the three SOP classes Digital Mammography Image Storage - For Presentation, BreastTomosynthesis Images encoded as CT Image Storage and Breast Tomosynthesis Image Storage, the following constraints must be met:

Table 102: Common Requirements for Mammography and Breast Tomosynthesis Images

Attribute Name	Tag	Constraint
Pixel representation	(0028,0103)	Value = 0
Bits allocated	(0028,0100)	Value = 8 or value = 16
High bit	(0028,0102)	Bits stored in {8, 10, 12, 14, 15, 16} and bits stored = highbit + 1
Bits stored	(0028,0101)	
Samples per pixel	(0028,0002)	Value = 1
Photometric interpretation	(0028,0004)	Value = "MONOCHROME1" or Value = "MONOCHROME2"

- Ultrasound Image Storage: 1.2.840.10008.5.1.4.1.1.6.1

  The following constraints must be met in order to recognize images as ultrasound images:

Table 103: Requirements for Ultrasound Images

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.6.1"
Manufacturer	(0008,0070)	Must be present and valid.
Manufacture's model name	(0008,1090)	For manufacturer "GE Healthcare": Value must not be "Invenia" or "Somo-V"

- Ultrasound Multi-frame Image Storage: 1.2.840.10008.5.1.4.1.1.3.1

  The following constraints must be met in order to recognize images as ultrasound multi-frame images:

Table 104: Requirements for Ultrasound Multi-Frame Images

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.3.1"
Manufacturer	(0008,0070)	Must be present and valid.
Manufacture's model name	(0008,1090)	For manufacturer "GE Healthcare": Value must not be "Invenia" or "Somo-V"

- Grayscale Softcopy Presentation States (GSPS): 1.2.840.10008.5.1.4.1.1.11.1

Only data with graphical annotations is recognized. The following constraints must be met inorder to recognize objects as grayscale softcopy presentation states:

Table 105: Requirements for Grayscale Softcopy Presentation States (GSPS)

Table 105: Requirements for Grayscale Softcopy Presentation States (GSPS)

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.11.1"
Graphic Type	(0070,0023)	Supported values: CIRCLE ELLIPSE POLYLINE

- Mammography CAD SR: 1.2.840.10008.5.1.4.1.1.88.50

The following constraints must be met in order to recognize images as mammography computer-aided detection structured reports:

Table 106: Requirements for Mammography CAD SR

Attribute Name	Tag	Constraint
SOP class UID	(0008,0016)	Value = "1.2.840.10008.5.1.4.1.1.88.50"
Manufacturer	(0008,0070)	Supported values: "SIEMENS", "iCAD, Inc.", "VuCOMP", "R2 Technology, Inc." , "ScreenPoint Medical"
Software Version(s)	(0018,1020)	The following software versions are supported per manufacturer: "SIEMENS": "syngo MammoCAD" "iCAD, Inc.": "7.2-H+", "Premier-D" "VuCOMP": "CAD 2.0.0.0", "CAD 2.1.0.0" "R2 Technology, Inc.": "1.5.1.5", "1.2.0.27", "1.5.0.43", "2.1.0.30"

Attribute Name	Tag	Constraint
		ScreenPoint Medical": "1.2.1" , "Transpara 1.4.0", "Transpara 1.6.0" or higher compatible versions

CAD structured reports of manufacturers or other software versions of the listed manufacturers may or may not be displayed correctly. A warning message is not displayed to the user in this case.

For CAD SRs meeting these constraints, only those single image findings are displayed thatmeet the following constraints:

Table 107: Constraints for Mammography CAD SR

Attribute Name	Tag	Constraint
Single Image Finding	EV (111059, DCM, "Single Image Finding")	Supported values: EV (F-01775, SRT, "Calcification Cluster") EV (F-01775, SRT 1.1, "Calcification Cluster") EV (F-01796, SRT, "Mammography breast density") EV (F-01796, SRT 1.1, "Mammography breast density") EV (F-01776, SRT, "Individual Calcification")(Only if not part of a calcification cluster) EV (F-01776, SRT 1.1, "Individual Calcification")(Only if not part of a calcification cluster) EV (F-01710, SRT, "Breast Composition") (regardless of rendering intent) EV (DS-1, 99- SCREEPOINTMED, "Decision Support Finding") EV (DS-2, 99- SCREENPOINTMED, "Decision Support Alias Finding")
Rendering Intent	EV (111056,DCM, "Rendering Intent")	Value = EV (111150, DCM, "Presentation Required: Rendering device is expected to present") if single image finding is **not** one of EV (F- 01710, SRT, "Breast

Attribute Name	Tag	Constraint
		Composition"), EV (DS-1, 99- SCREEPOINTMED, "Decision Support Finding") or EV (DS-2,99-SCREENPOINTMED, "Decision Support Alias Finding")
Outline	EV (111041,DCM, "Outline")	For the following EV the outline may or may not be present: EV (F-01710, SRT, "Breast Composition") EV (F-01775, SRT, "Calcification Cluster") EV (F-01775, SRT 1.1, "Calcification Cluster") For other single image findings, the value must be present and contain at least one point.

7.9 CT Plugin Applications

7.9.1 Standard Extensions of RAW Data Storage SOP Class

The following table lists the standard extensions for RAW Data Storage SOP Class.

Table 108: Standard extensions for RAW Data Storage SOP Class

Attribute Name	Tag	Constraint (case insensitive)
Referenced Series Sequence	(0008,1115)	Private stored information about used algorithms.

7.9.1.1 SOP Specific Conformance to Viewing Application

The following SOP classes are recognized and displayed by the *syngo*.Breast Care software:

7.10 MI Organ processing

7.10.1 MEDCOM OOG Module

The table in this section contains private IOD Attributes that describe MEDCOM Object Oriented Graphics (OOG). This module is used whenever object graphics is drawn on the image and need to be stored as graphic object properties. Given the condition that the module contents were not removed by other modalities, the graphic objects remain animatable if such an image was transferred and is then retrieved back.

Table 109: Private IOD Attributes of MEDCOM OOG

Attribute Name	Tag	VR	VM	Owner	Type	Notes
MedCom OOG Type	(0029, xx08)	CS	1	SIEMENS MEDCOM OOG	1	MEDCOM Object Oriented Graphics (OOG) identification characteristics. Defined Terms: MEDCOM OOG 1 MEDCOM OOG 2
MedCom OOG Version	(0029, xx09)	LO	1	SIEMENS MEDCOM OOG	3	Version of MEDCOM OOG Info(0029, xx10) format.
MedCom OOG Info	(0029, xx10)	OB	1	SIEMENS MEDCOM OOG	3	MEDCOM Object Oriented Graphics (OOG) data.

The graphics objects are also fully drawn in the Image Overlay Plane for compatibility with other products, which do not support the MedCom OOG module. Any system not supporting the MedCom OOG module shall remove the OOG module and its contents when modifying the image overlay plane content.

7.10.2 Standard Extensions of NM SOP Class

The following table lists the data dictionary of all DICOM IOD attributes which are encoded in a DICOM standard where the Private Creator Identification is, “Siemens MED NM”

Table 110: Siemens MED NM private tags

Tag	VR	VM	Value
(0019, 000F)	SL	1 - n	Siemens ICON Data Type
(0019, 00A5)	SS	1 - n	Number of repeats per phase
(0019, 00A6)	SS	1 - n	Cycles per repeat
(0019, 00A7)	SL	1 - n	Repeat start time
(0019, 00A8)	SL	1 - n	Repeat stop time
(0019, 00A9)	SL	1 - n	Effective repeat time
(0019, 00AA)	SS	1 - n	Acquired cycles per repeat
(0019, 1016)	SS	1 - n	Number of Views
(0021, 0000)	OB	1	ECAT File Menu Header
(0021, 0001)	OB	1	ECAT File Subheader
(0023, 0001)	US	1	DICOM Reader flag
(0029, 0008)	CS	1	Modality Image Header Type
(0029, 0009)	LO	1	Modality Image Header Version
(0029, 0010)	OB	1	Modality Image Header Info

Tag	VR	VM	Value
(0033, 0000)	FL	n	Flood correction Matrix Det 1 upto SR 2.0
(0033, 0001)	FL	n	Flood correction Matrix Det 2 upto SR 2.0
(0033, 0010)	FL	n	COR Data for Detector 1
(0033, 0011)	FL	n	COR Data for Detector 2
(0033, 0014)	FL	n	MHR Y - Shift 1
(0033, 0015)	FL	n	MHR Y - Shift 2
(0033, 0018)	FL	n	NCO Data 1
(0033, 0019)	FL	n	NCO Data 2
(0033, 0020)	FL	1	Bed Correction Angle
(0033, 0021)	FL	1	Gantry Correction Angle
(0033, 0022)	SS	n	Bed U / D Correction Data
(0033, 0023)	SS	n	Gantry L / R Correction Data
(0033, 0024)	FL	1	Backprojection angle head 1
(0033, 0025)	FL	1	Backprojection angle head 2
(0033, 0028)	SL	1	Number of point sources used for NCO and MHR
(0033, 0029)	FL	1	Crystal thickness
(0033, 0030)	LO	1	Preset name used for acquisition
(0033, 0031)	FL	1	Camera config angle
(0033, 0032)	LO	1	Crystal type Startburst or not
(0033, 0033)	SL	1	Gantry step for COIN acquisitions
(0033, 0034)	FL	1	Bed step for whole body or Coin acquisitions
(0033, 0035)	FL	1	Weight factor table for coincidence acquisitions
(0033, 0036)	FL	1	Transaxial acceptance width for coincidence
(0033, 0037)	SL	1	Starburst flags
(0033, 0038)	FL	1	Pixel scale factor
(0033, 1038)	FL	1	Pixel scale factor
(0035, 0000)	LO	1	Specialized tomo type
(0035, 0001)	LO	1	Energy window type
(0035, 0002)	SS	1	Start and end row illuminated by wind position
(0035, 0003)	LO	1	Blank scan image for profile
(0035, 0004)	SS	1	Repeat number of the original dynamic SPECT
(0035, 0005)	SS	1	Phase number of the original dynamic SPECT
(0035, 0006)	LO	1	Siemens Profile 2 Image Sub type
(0039, 0000)	LT	1	Toshiba CBF activity results
(0039, 0001)	LT	1	Related CT Series Instance UID

Tag	VR	VM	Value
(0041, 0001)	SL	1	Whole Body Tomo Position Index
(0041, 0002)	SL	1	Whole Body Tomo Number of Positions
(0041, 0003)	FL	1	Horizontal Table Position of CT scan
(0041, 0004)	FL	1	Effective Energy for CT Scan
(0041, 0005)	FD	1 - n	Long Linear Drive Information for Detector 1
(0041, 0006)	FD	1 - n	Long Linear Drive Information for Detector 2
(0041, 0007)	FD	1 - n	Trunnion Information for Detector 1
(0041, 0008)	FD	1 - n	Trunnion Information for Detector 2
(0041, 0009)	FL	1	Broad Beam Factor
(0041, 000A)	FD	1	Original whole body Position
(0041, 000B)	FD	1	Whole body Scan Range
(0041, 0010)	FL	1 - 3	Effective Frame Duration
(0041, 0011)	FL	1 - n	Gated Frame Duration
(0043, 0001)	FL	1 - n	Detector View Angle
(0043, 0002)	FD	1 - 16	Transformation Matrix
(0043, 0003)	FL	1-n	View Dependent Y shift MHR for Detector 1
(0043, 0004)	FL	1-n	View Dependent Y shift MHR for Detector 2
(0045, 0001)	LO	1-n	Planar Processing String
(0055, 0004)	SS	1	Prompt window width
(0055, 0005)	SS	1	Random window width
(0055, 007E)	FL	1-n	Collimator thickness
(0055, 007F)	FL	1-n	Collimator angular resolution
(0055, 00C0)	SS	1-n	Useful Field of View
(0057, 0001)	LO	1	syngo MI DICOM original image type
(0057, 0002)	FL	1	Dose calibration factor
(0057, 0003)	LO	1	Units
(0057, 0004)	LO	1	Decay correction
(0057, 0005)	SL	n	Radio nuclide half life
(0057, 0006)	FL	1	Rescale intercept
(0057, 0007)	FL	1	Rescale Slope
(0057, 0008)	FL	1	Frame reference time
(0057, 0009)	SL	1	Number of Radiopharmaceutical information sequence
(0057, 000A)	FL	1	Decay factor
(0057, 000B)	LO	1	Counts source
(0057, 000C)	SL	n	Radionuclide positron fraction

Tag	VR	VM	Value
(0057, 000E)	US	1-n	Trigger Time of CT Slice
(0057, 000F)	SS	1	QSPECT Compliant Flag
(0061, 0001)	FL	1 - n	X Principal Ray Offset
(0061, 0005)	FL	1 - n	Y Principal Ray Offset
(0061, 0009)	FL	1 - n	X Principal Ray Angle
(0061, 000A)	FL	1 - n	Y Principal Ray Angle
(0061, 000B)	FL	1 - n	X Short Focal Length
(0061, 000C)	FL	1 - n	Y Short Focal Length
(0061, 000D)	FL	1 - n	X Long Focal Length
(0061, 000E)	FL	1 - n	Y Long Focal Length
(0061, 000F)	FL	1 - n	X Focal Scaling
(0061, 0010)	FL	1 - n	Y Focal Scaling
(0061, 0011)	FL	1 - n	X Motion Correction Shift
(0061, 0015)	FL	1 - n	Y Motion Correction Shift
(0061, 0019)	FL	1	X Heart Centre
(0061, 001A)	FL	1	Y Heart Centre
(0061, 001B)	FL	1	Z Heart Centre
(0061, 001C)	LO	1	Image Pixel Content Type
(0061, 001D)	SS	1	Auto Save Corrected Series
(0061, 001E)	LT	1	Distorted Series Instance UID
(0061, 0021)	SS	1-n	Recon Range
(0061, 0022)	LO	1	Recon Orientation
(0061, 0023)	FL	1-n	Recon Selected Angular Range
(0061, 0024)	FL	1	Recon Transverse Angle
(0061, 0025)	FL	1	Recon Sagittal Angle
(0061, 0026)	FL	1	Recon X Mask Size
(0061, 0027)	FL	1	Recon Y Mask Size
(0061, 0028)	FL	1	Recon X Image Centre
(0061, 0029)	FL	1	Recon Y Image Centre
(0061, 002A)	FL	1	Recon Z Image Centre
(0061, 002B)	FL	1	Recon X Zoom
(0061, 002C)	FL	1	Recon Y Zoom
(0061, 002D)	FL	1	Recon Threshold
(0061, 002E)	FL	1	Recon Output Pixel Size
(0061, 002F)	LO	1 - n	Scatter Estimation Method

Tag	VR	VM	Value
(0061, 0030)	LO	1 - n	Scatter Estimation Method Mode
(0061, 0031)	FL	1 - n	Scatter Estimation Lower Window Weights
(0061, 0032)	FL	1 - n	Scatter Estimation Upper Window Weights
(0061, 0033)	LO	1 - n	Scatter Estimation Window Mode
(0061, 0034)	LO	1 - n	Scatter Estimation Filter
(0061, 0035)	LO	1	Recon RawTomo Input Uid
(0061, 0036)	LO	1	Recon CT Input Uid
(0061, 0037)	FL	1	Recon Z Mask Size
(0061, 0038)	FL	1	Recon X Mask Centre
(0061, 0039)	FL	1	Recon Y Mask Centre
(0061, 003A)	FL	1	Recon Z Mask Centre
(0061, 003B)	FL	1	First Slice Index
(0061, 003C)	LT	1	Non Image UID
(0061, 003D)	LT	1	Non Image Series UID
(0061, 003E)	LT	2	Non Image Associated Parent Series UID
(0061, 003F)	FL	1-N	Original Bin Time
(0061, 0051)	LT	1	Raw Tomo Series UID
(0061, 0052)	LT	1	LowRes CT Series UID
(0061, 0053)	LT	1	HighRes CT Series UID
(0061, 0054)	FL	1- 4	Vector Map Offset
(0061, 0055)	FL	1- 2	Collimator Hole Length
(0061, 0056)	FL	1- 2	Collimator Entry Hole Diameter
(0061, 0057)	FL	1- 2	Collimator Exit Hole Diameter
(0061, 0058)	FL	1- 2	Collimator Front Padding Distance
(0061, 0059)	FL	1- 2	Collimator Back Spacing Distance
(0061, 005A)	FL	1- 2	Collimator Mean Hole Area
(0061, 005B)	FL	1- 2	Collimator Field of View
(0061, 005C)	FL	1- 2	Collimator Septal Penetration
(0061, 005D)	FL	1- 2	Collimator Sensitivity
(0061, 005E)	FL	1- 2	Crystal Depth of Interaction
(0061, 005F)	FL	1- 2	Crystal Intrinsic Resolution
(0061, 0060)	FL	1-n	IQSPECT Heart Offset Detector 1
(0061, 0061)	FL	1-n	IQSPECT Heart Offset Detector 2
(0061, 0062)	LT	1	Recon Output Type
(0061, 0067)	LT	1	Attenuation Correction Temporal Relationship

Tag	VR	VM	Value
(0061, 0068)	LT	1	Attenuation Correction Source
(0061, 006E)	LT	1	Recon Method
(0061, 006F)	FL	1-n	Reconstruction Angle
(0061, 0070)	LT	1	Reconstruction Algorithm
(0061, 0071)	FD	16	CT Transformation Matrix
(0061, 007A)	FD	1	Assay Dose
(0061, 007B)	DT	1	Assay Date Time
(0061, 007C)	FD	1	Effective Dose
(0061, 007D)	FD	1	Residual Dose
(0061, 007E)	DT	1	Residual Dose Date Time
(0061, 0081)	LT	1	Legacy Corrected Series UID
(0061, 0082)	LT	1	Legacy Corrected Image UID
(0061, 0083)	FD	1-2	Collimator Septal Thickness
(0061, 0085)	DT	1-n	View Start Times
(0061, 0086)	FD	1-n	View Pause Durations
(0061, 0087)	SL	1	Reconstruction Performance Range
(0061, 0088)	DT	1	Injection Date Time
(0061, 0089)	DT	1	Effective Dose Date Time
(0061, 008A)	FD	1	Sensitivity Calibration Distance (Detector 1)
(0061, 008B)	FD	1	Sensitivity Calibration Distance (Detector 2)
(0061, 008C)	LO	1	UTC Offset (Time zone offset)
(0061, 008D)	SS	1	PET Data Flag
(7FE3, 0014)	OW	1	Minimum pixel in frame
(7FE3, 0015)	OW	1	Maximum pixel in frame
(7FE3, 0029)	OW	1	Number of R - Waves in frame

7.11 Multi-modality Oncology

syngo.via will create functional images from special applications. Those will be encoded as Standard or Standard Extended SOP Classes. For the Multi-modality Oncology (MM Oncology) application, Standard Extended Real World Value Mapping objects will be created. Please see the following table for an overview of additional Standard Attributes provided with the objects.

7.11.1 Real World Value Mapping IOD

The following table lists extended attributes that may be provided in a Real World Value Mapping object in addition to the standard attributes defined by the DICOM standard.

Table 111: Extended attributes for Real World Value Mapping

Attribute Name	Tag	Value
Radionuclide Total Dose	(0018,1074)	The radiopharmaceutical dose administered to the patient measured in Becquerel's (Bq) at the Radiopharmaceutical Start Date Time (0018,1078). Provided only when the Real World Value Mapping is for an SUV unit type referring to PET data. The value is copied from the PET images referenced by this RWVM object, or provided by the user
Radionuclide Half Life	(0018,1075)	The radionuclide half-life, in seconds, that was used in the correction of the referenced image. Provided only when the Real World Value Mapping is for an SUV unit type referring to PET data. The value is copied from the PET images referenced by this RWVM object, or provided by the user
Radiopharmaceutical Start DateTime	(0018,1078)	Date and time of start of administration. The actual date and time of radiopharmaceutical administration to the patient for imaging purposes. Provided only when the Real World Value Mapping is for an SUV unit type referring to PET data. The value is copied from the PET images referenced by this RWVM object or provided by the user. Note: even if the original images contained only Radiopharmaceutical Start Time (0018,1072), this value is stored as Radiopharmaceutical Start DateTime (0018,1078).

7.12 CT Post-Processing Applications and Plugin Applications

7.12.1 Privaten Attributs

The following private attributes divert from the DICOM Standard by the length of the value representation. The length can in certain cases exceed the one defined by the standard.

Table 112: Private Attributes

Private DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,44)	Camera Near Clip Plane	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,86)	Camera Parallel Epiped	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,94)	Measurement Evaluation Value	DS	1
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,9C)	Measurement Evaluation Centroid	DS	0-n
(002B,SIEMENS SYNGO ADVANCED PRESENTATION,02)	DualEnergy Measurement Tag	SH	1

The following attributes used in private attributes sequence use a different VR as defined by the standard.

Table 113: Private attributes that use different VR

Private DICOM Tag	DICOM Tag	VR
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,02) >(0029,SIEMENS SYNGO ADVANCED PRESENTATION,EE) >(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A7) >(0029,SIEMENS SYNGO ADVANCED PRESENTATION,31)	(0070,0253)	DS

The following attributes used in private attributes sequence use additional characters in the VR as defined by the standard.

Table 114: Private attributes that use additional characters in VR

Private DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,02) >(0029,SIEMENS SYNGO ADVANCED PRESENTATION,EE) >(0029,SIEMENS SYNGO ADVANCED PRESENTATION,A7) >(0029,SIEMENS SYNGO ADVANCED PRESENTATION,31) >(0029,SIEMENS SYNGO ADVANCED PRESENTATION,38)	Referenced Syngo Uid	UI	4

The following private attributes do not fully implement the macro as required by the standard.

Table 115: Private attributes that do not fully implement macro

Private DICOM Tag	Name	VR	VM
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,93)	Measurement Evaluation Sequence	SQ	1-n

7.12.2 Standard Extensions of Raw Data Storage SOP Class

The Raw Data Storage SOP class 1.2.840.10008.5.1.4.1.1.66 is extended by the following attributes.

Table 116: Standard Extensions of Raw Data

DICOM Attribute Name	Tag	VR
Series Instance UID	(0020,000E)	UI

7.12.3 Standard Extensions of Spatial Registration Storage SOP Class

The Spatial Registration Storage SOP class 1.2.840.10008.5.1.4.1.1.66.1 is extended by the following attributes.

Table 117: General Equipment Module

DICOM Attribute Name	Tag	VR
Pixel Padding Value	(0028,0120)	US or SS

7.12.4 Standard Extensions of Secondary Capture Image SOP Class

The Secondary Capture Image SOP class 1.2.840.10008.5.1.4.1.1.7 is extended by the following attributes.

Table 118: Image Plane Module

DICOM Attribute Name	Tag	VR
Image Position (Patient)	(0020,0032)	DS
Image Orientation (Patient)	(0020,0037)	DS
Slice Thickness	(0018,0050)	DS

7.12.5 Standard Extensions of Basic Text SR SOP Class

The Basic Text SR SOP class 1.2.840.10008.5.1.4.1.1.88.11 is extended by the following attributes.

Table 119: General Series Module

DICOM Attribute Name	Tag	VR
Body Part Examined	(0018,0015)	CS
Laterality	(0020,0060)	CS
Request Attributes SQ	(0040,0275)	SQ

Table 120: General Image Module

DICOM Attribute Name	Tag	VR
Patient Orientation	(0020,0020)	CS

Table 121: General Equipment Module

DICOM Attribute Name	Tag	VR
Pixel Padding Value	(0028,0120)	US or SS

Table 122: Patient Module

DICOM Attribute Name	Tag	VR
Other Patient IDs	(0010,1000)	LO

7.12.6 Standard Extensions of Segmentation Storage SOP Class

The Segmentation Storage SOP class 1.2.840.10008.5.1.4.1.1.66.4 is extended by the following attributes.

Table 123: Segmentation Image Module

DICOM Attribute Name	Tag	VR
Segment Sequence	(0062,0002)	SQ
>Segmented Property Category Code Sequence	(0062,0003)	SQ
>Segmented Property Type Code SQ	(0062,000F)	SQ
>Segment Algorithm Name	(0062,0009)	LO

Table 124: General Equipment Module

DICOM Attribute Name	Tag	VR
Pixel Padding Value	(0028,0120)	US or SS

7.13 CT Pneumonia Plugin

7.13.1 Standard Extensions of Secondary Capture Image SOP Class

The Secondary Capture Image SOP class 1.2.840.10008.5.1.4.1.1.7 is extended by the following attributes.

Table 125: Frame of Reference Module

DICOM Attribute Name	Tag	VR
Frame of Reference UID	(0020,0052)	UI

Table 126: Referenced Image Sequence Module

DICOM Attribute Name	Tag	VR
Referenced Frame Number *	(0008,1160)	IS

** Will be used in case of single frame images to enable synched scrolling functionality in secondary capture images.*

7.14 CT Dual Energy Post-Processing Application

7.14.1 Standard Extensions of CT Image SOP Class

The CT Image SOP class 1.2.840.10008.5.1.4.1.1.2) is extended by the following attributes.

Table 127: Standard Extensions of CT image

DICOM Attribute Name	Tag	VR
KVP *	(0018,0060)	DS

** Will be there for multi-energy images and represents a single well-defined KVP.*

7.15 CT Calcium Scoring Post-Processing

7.15.1 Standard Extensions of Secondary Capture Image SOP Class

The Secondary Capture Image SOP class 1.2.840.10008.5.1.4.1.1.7 is extended by the following attributes.

Table 128: Referenced Image Sequence Module

DICOM Attribute Name	Tag	VR
Referenced Frame Number *	(0008,1160)	IS

** Will be used in case of single frame images to enable synched scrolling functionality in secondary capture images.*

Annex A: Index of Tables

Annex B: Table of Figures

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Siemens Healthineers Headquarters
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen, Germany
Phone: +49 9131 84-0
siemens-healthineers.com