SIEMENS

SOMATOM Definition/Definition AS

CT

DICOM Conformance Statement

Version *syngo* CT 2008G

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Manufacturer’s note:

This product bears a CE marking in accordance with the provisions of the Council Directive 93/42/EEC of June 14th, 1993 concerning medical devices.

The CE marking applies only to medico-technical products/ medical products introduced in connection with the above-mentioned comprehensive EC directives.

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Introduction

Overview

This DICOM Conformance Statement is written according to part PS 3.2 of [1].

The applications described in this conformance statement are implemented in the Siemens SOMATOM products using software Somaris/7 *syngo* CT 2008G (internal: VA20A).

The Somaris/7 DICOM network implementation acts as SCU and SCP for the DICOM Verification, Storage, Storage Commitment Push Model, and Query/Retrieve Services. It acts as SCU for the DICOM Print Management Service, the Modality Worklist Service, and the Performed Procedure Step Service.

These services are described in "Part I".

The Somaris/7 DICOM Media Storage Service implementation acts as FSC, FSU, and FSR for the specified application profiles and the related SOP Class instances. These services are described in "Part II".

Somaris/7 is based on a Siemens common medical platform. This platform is shared with other Siemens modalities in order to provide a common look and feel and common interoperability features.

In this document parts of the Siemens common medical platform are referenced by the terms "*syngo*®"[1], "MedCom", and "CSA".

As Somaris/7 is a *syngo* based product, this DICOM Conformance Statement is based on the corresponding *syngo* template [2].

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[1] '*syngo*' and '*We speak syngo*' are registered trademarks of Siemens AG

Audience

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

Scope

This DICOM Conformance Statement refers to Siemens SOMATOM products using software Somaris/7. The following table relates software names to Siemens products.

Software Name	SIEMENS Products
syngo CT 2008G (internal: Somaris/7 VA20A)	SOMATOM Definition SOMATOM Definition AS

Definitions, Acronyms and Abbreviations

Definitions

- **DICOM**: Digital Imaging and Communications in Medicine
- **DIMSE**: DICOM Message Service Element
- **DIMSE-C**: DICOM Message Service Element with Composite information objects

Acronyms and Abbreviations

- **ACR**: American College of Radiology
- **AE**: DICOM Application Entity
- **ASCII**: American Standard Code for Information Interchange
- **FSC**: File Set Creator
- **FSR**: File Set Reader
- **FSU**: File Set Updater
- **HIS**: Hospital Information System
- **IOD**: DICOM Information Object Definition
- **ISO**: International Standard Organization
- **NEMA**: National Electrical Manufacturers Association
- **O**: Optional Key Attribute
- **R**: Required Key Attribute
- **RIS**: Radiology Information System
- **RWA**: Real-World Activity
- **PDU**: DICOM Protocol Data Unit
- **SCU**: DICOM Service Class User (DICOM client)
- **SCP**: DICOM Service Class Provider (DICOM server)
- **SOP**: DICOM Service-Object Pair
- **U**: Unique Key Attribute
- **UID**: Unique Identifier
- **VR**: Value Representation

References

[1]: Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-3.14

[2]: *syngo* VE32B DICOM Conformance Statement

Connectivity and Interoperability

The implementation of the Somaris/7 DICOM interface has been carefully tested to assure correspondence with this Conformance Statement. But the Conformance Statement and the DICOM standard do not guarantee interoperability of Siemens modalities and modalities of other vendors. The user must compare the relevant Conformance Statements and if a successful interconnection should be possible, the user is responsible to specify an appropriate test suite and to validate the interoperability, which is required. A network environment may need additional functions out of the scope of DICOM.

PART
A

DICOM
Conformance Statement

Network

CHAPTER
A.1 Implementation Models

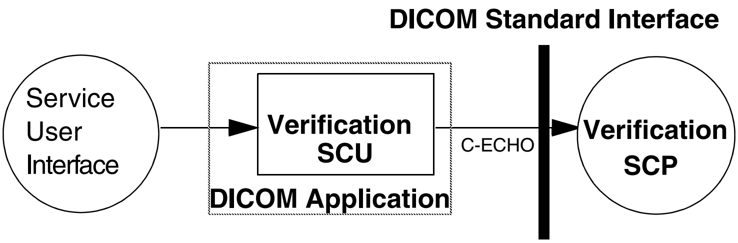
Verification

The Verification service class defines an application-level class of service which allows for the operator to verify the ability of an application on a remote node to respond to DICOM messages. The DICOM Service Tool application supports the Verification service to act as SCU.

The other direction – responding to Verification requests from remote applications – is handled by the Storage SCP application.

Application Data Flow Diagram

The Somaris/7 DICOM network implementation acts as SCU for the C-ECHO DICOM network service. The product target operating system is Windows XP.



Functional Definitions of Application Entities

The DICOM Service Tool application opens an association when a "verification" of a remote application is requested during a configuration session. This can be done when entering new data for remote application configuration or to verify existing configuration data.

Sequencing of Real-World Activities

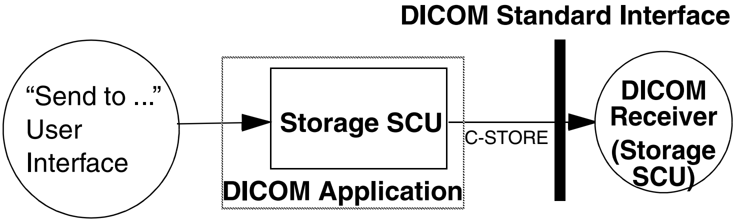
Newly configured data of a remote AE have to be saved first, before a "verification" of these data is possible.

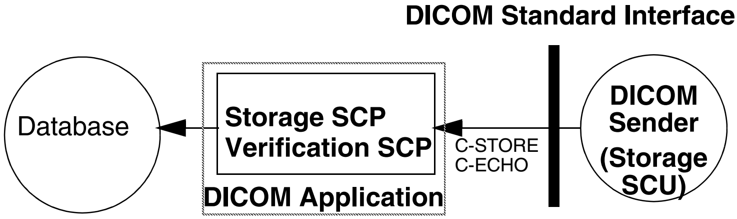
Storage

The Somaris/7 DICOM Application Entity both originates associations for Storage of DICOM Composite Information Objects in Remote Application Entities and accepts association requests for Storage from Remote Application Entities.

Application Data Flow Diagram

The Somaris/7 DICOM network implementation acts as SCU and SCP for the C-STORE DICOM network service and as SCP for the C-ECHO DICOM network service. The product target operating system is Windows XP.





Functional Definitions of Application Entities

The Storage SCU is invoked by the job control interface that is responsible for processing network archiving tasks. The job consists of data describing the composite image objects selected for storage and the destination. An association is negotiated with the destination application entity and the image data is transferred using the C-STORE DIMSE-Service. Status of the transfer is reported to the job control interface.

The Storage SCP component of the Siemens Somaris/7 DICOM application is operating as background server process. It is existing, when the machine is powered on and waits for Storage association requests. Upon accepting an association with a negotiated Presentation Context it starts to receive the Composite Image Objects and imports them to local database. Verification requests will be processed and responded to by Storage SCP component, too.

Sequencing of Real-World Activities

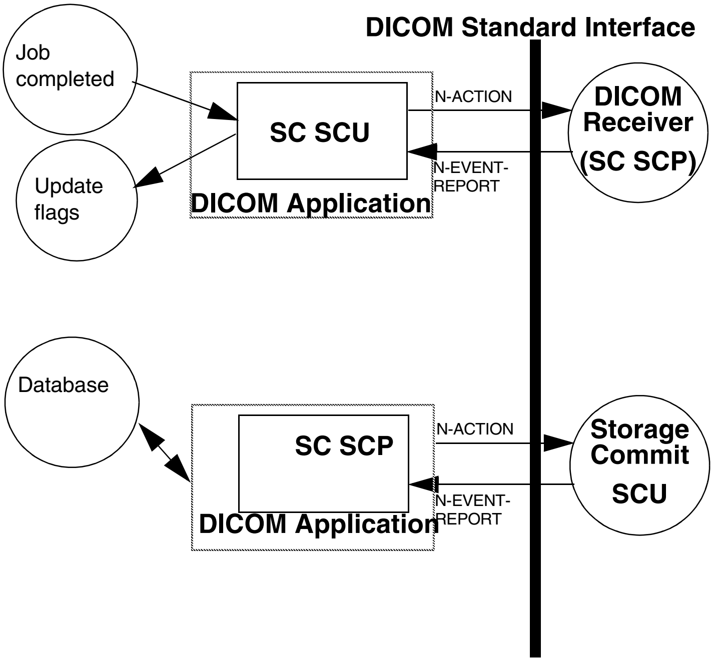
Not applicable.

Storage Commitment

The Storage Commitment service class defines an application-level class of service which facilitates the commitment to storage. It performs an additional task of commitment of composite objects apart from the network based storage of images as defined by the Storage Service class. The Somaris/7 DICOM implementation supports the Storage Commitment Push Model as SCU and SCP.

Application Data Flow Diagram

The Somaris/7 DICOM network implementation acts as SCU for the Storage Commitment Push Model Service using the Storage Commitment Service Class. The product target operating system is Windows XP.



Functional Definitions of Application Entities

With each successfully completed send job, the Somaris/7 DICOM application will create a Storage Commitment Push Model Identifier from the SOP Instances sent. Then a Storage Commit Request is triggered. Depending on configuration, the Somaris/7 DICOM application will keep the association open for responses with a configurable time-out, or closes the association and expects responses on a different association that has to be established by the remote Storage Commitment SCP.

The commitment status derived from the related trigger response will be indicated in the Status Flags of the related entrity. It is possible to create triggers ("auto rules") from this event.

The Transaction UIDs of the pending commitment request are kept "open" for a configurable amount in time (default: 1h). If the "open time" for a pending commitment request has elapsed without a related response from the provider, the Transaction UID is removed and the related entities are indicated as "commit failed".

In any case, commitment will only be requested for previously and successfully sent images.

Sequencing of real World Activities

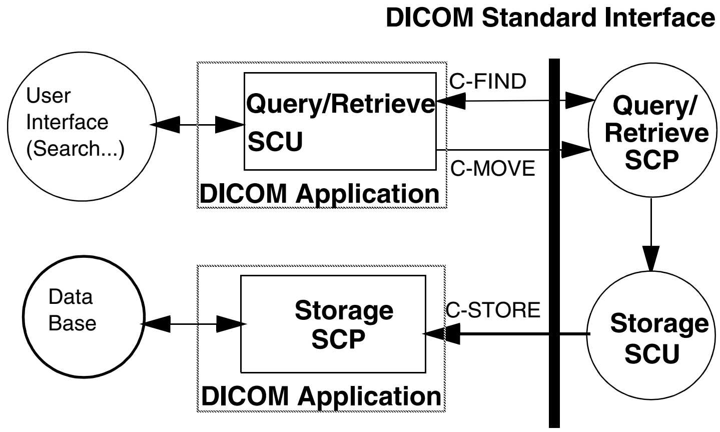
The Storage Commitment trigger is automatically derived from the successful completion of a Send job.

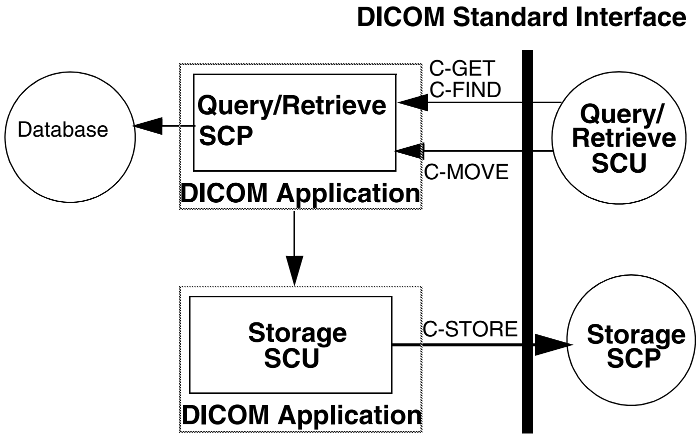
Query/Retrieve

The query/retrieve service class defines an application-level class of services which facilitates the management of images and patient data against the well defined information model of DICOM and allows a DICOM AE to retrieve images from a remote DICOM node or to request a remote DICOM AE to initiate a transfer of images to another DICOM AE. The DICOM query/retrieve application supports the query/retrieve services to act as SCU and SCP.

Application Data Flow Diagram

The Somaris/7 DICOM network implementation acts as SCU and SCP for the query/retrieve network service. The product target operating system is Windows XP.





Functional Definitions of Application Entities

The query/retrieve SCU requests the remote query/retrieve SCP to perform a search and match to the keys specified in the request in order to display the results in the user interface. Depending on user action (Import) the Somaris/7 DICOM SCU sends a C-MOVE DIMSE service to initiate a C-STORE sub-operation on the SCP to start an image transfer from the remote Storage SCU to the Somaris/7 DICOM Storage SCP.

The query/retrieve SCP responds to C-FIND DIMSE services from remote SCU applications. Depending on further remote request, a C-GET or a C-MOVE involves the Somaris/7 DICOM query/retrieve SCP application to initiate a C-STORE association (by triggering and parameterizing the own Storage SCU) to send image objects to a remote Storage SCP.

All components of the Somaris/7 DICOM query/retrieve SCP application are operating as background server processes. They are existing when the machine is powered on and then respond to queries based on the records stored in its database.

Note

The Somaris/7 DICOM query/retrieve SCU application will execute new queries based upon the data found in the higher level query. For details see → Page A.2–54.

Sequencing of Real-World Activities

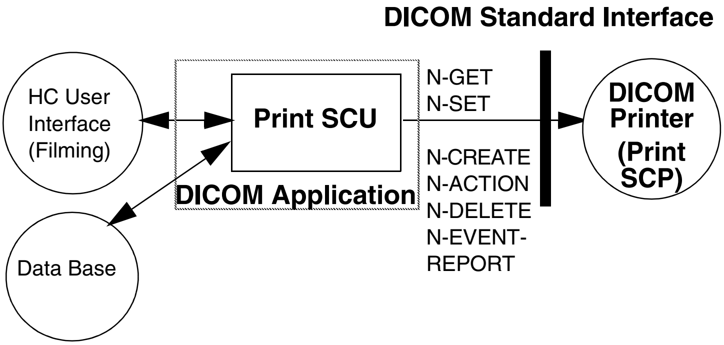
Retrieve of images is only possible if results from a previous "Search..." operation exist and those entities can be selected for "Import".

Print

The Print Management Service Classes define an application-level class of services which facilitate the printing of images on a hardcopy medium. The print management SCU and print management SCP are peer DICOM print management application entities. The DICOM print application supports the print management DIMSE services to act as SCU.

Application Data Flow Diagram

The Somaris/7 DICOM network implementation acts as SCU for the print management network service. The product target operating system is Windows XP.



Functional Definitions of Application Entities

The Print SCU is invoked by the user interface to set up 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.

Sequencing of Real-World Activities

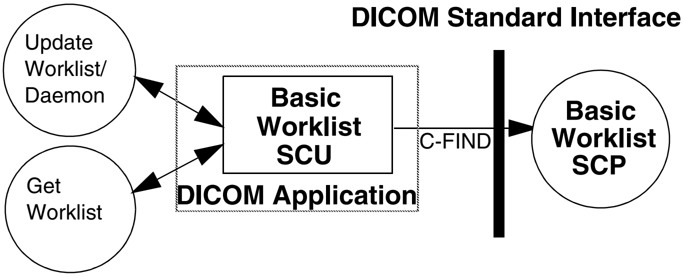
Not applicable.

Model Worklist

The Basic Worklist Service Class defines an application-level class of service which facilitates the transfer of worklists from the information system to the imaging modality. The worklist is queried by the AE and supplies the SCU with the scheduled tasks, which have to be performed on the modality. The DICOM worklist application supports the worklist service as SCU.

Application Data Flow Diagram

The Somaris/7 DICOM network implementation acts as SCU for the Basic Worklist Service using the Modality Worklist SOP Class. The product target Operating System is Windows XP.



Note: It is configurable to get the worklist updates either automatically (in a configurable time interval) or manually (initiated by the user). There are two kinds of query the user can do: broad worklist query (all jobs for the own modality or own application entity) and patient based worklist query (where more search keys can be given, including Patient Name and Patient ID).

Functional Definitions of Application Entities

The worklist SCU ("broad query") is invoked from the patient browser user interface or by timer to request the worklist from a remote Information System (Modality Worklist SCP). This is done to perform a match to the internal worklist query keys specified in the C-FIND DIMSE service issued for the Modality Worklist Model.

The Worklist SCP responds to the C-FIND query and scheduled imaging service requests (scheduled procedure steps) and patient demographic information will be downloaded from the information system to the Somaris/7 modality. All information retrieved will be held in the scheduling database for usage during patient registration procedure.

Sequencing of Real-World Activities

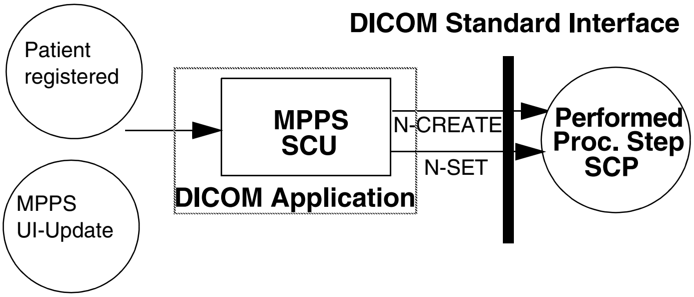
The "narrow" (patient based) Worklist Query requires that sufficient matching keys or a unique matching key are/is entered before the query is issued. Only then a single response can be expected to complete the registration dialog.

Modality Performed Procedure Step

The Modality Performed Procedure Step service class defines an application-level class of service which facilitates the transfer of billing and radiation dose information from the imaging modality to the information system. The performed procedure step is created and set by the AE and supplies the SCP with the information about a real world procedure which is performed on the modality. The DICOM Modality Performed Procedure Step application supports the MPPS service as SCU.

Application Data Flow Diagram

The Somaris/7 DICOM network implementation acts as SCU for the worklist network service. The target operating system is Windows XP.



Functional Definitions of Application Entities

With registration of a patient (i.e. a Scheduled Procedure Step from Worklist), the Somaris/7 DICOM application will create a MPPS instance and communicate it to the MPPS SCP.

Furthermore a manual update can be performed with the Somaris/7 MPPS user interface. Only there it is possible to set the state of the MPPS to "Completed" or "Discontinued". If done so, the DICOM application will no longer allow updates on the related MPPS Instance.

Multiple requested procedures scheduled for a CT examination will result in multiple studies and MPPS, each requested procedure (RP) related to one study.

Somaris/7 supports creation of "unscheduled cases" by allowing MPPS instances to be communicated for locally registered patients.

Sequencing of real-World Activities

Not applicable.

CHAPTER
A.2 AE Specifications

Verification AE Specification

Association Establishment Policies

General

The Somaris/7 DICOM Service Tool application attempts to initiate a new open an association for verification request whenever the "verification" function is activated during network configuration of a remote DICOM application.

Number of Associations

The Somaris/7 DICOM Service Tool application initiates one association at a time to request verification.

Asynchronous Nature

The Somaris/7 DICOM implementation Service Tool application does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

Implementation Class UID is:

❏ “1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

❏ “SIEMENS_S7VA20A”.

Association Initiation by Real-World Activity

The Somaris/7 DICOM Service Tool application attempts to initiate a new association for

❏ DIMSE C-ECHO

service operations.

Associated Real-World Activity - Verification

Associated Real-World Activity - Verification SCU

The associated Real-World activity is a C-ECHO request initiated by the Service and Configuration SW environment whenever a "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 in the service environment and the association is closed.

Proposed Presentation Contexts - Verification SCU

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

SOP Specific Conformance Statement - Verification SCU

The Application conforms to the definition of a Verification SCU in accordance to the DICOM Standard.

Association Acceptance Policy

The Verification SCP is part of the Storage SCP – see → page A.2–19, *Association Acceptance Policy*.

Storage AE Specification

The Somaris/7 Storage service class user applications and service class provider applications use one AE when initiating/receiving associations to/from remote DICOM nodes.

The SIEMENS Somaris/7 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Classes as both an SCU and SCP:

SOP Class Name	SOP Class UID
Computed **R**adiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital **X**-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital **X**-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital **M**ammo**G**raphy Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital **M**ammo**G**raphy Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital **I**ntra-**o**ral **X**-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital **I**ntra-**o**ral **X**-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
Computed **T**omography Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultra**S**ound Multi-Frame Image Storage (retired) (SCP only)	1.2.840.10008.5.1.4.1.1.3

SOP Class Name	SOP Class UID
Ultra**S**ound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Magnetic **R**esonance Image Storage	1.2.840.10008.5.1.4.1.1.4
Ultra**S**ound Image Storage (retired) (SCP only)	1.2.840.10008.5.1.4.1.1.6
Ultra**S**ound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary **C**apture Image Storage	1.2.840.10008.5.1.4.1.1.7
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
X-Ray **A**ngiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray **R**adio**F**luoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Nuclear **M**edicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11

SOP Class Name	SOP Class UID
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65
X_Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67
PET Image Storage	1.2.840.10008.5.1.4.1.1.128
Radio **T**herapy **Image** Storage	1.2.840.10008.5.1.4.1.1.481.1
Radio **T**herapy **Dose** Storage	1.2.840.10008.5.1.4.1.1.481.2
Radio **T**herapy **Structure Set** Storage	1.2.840.10008.5.1.4.1.1.481.3
Radio **T**herapy **P**lan Storage	1.2.840.10008.5.1.4.1.1.481.5
Radio **T**herapy Ion **Plan** Storage	1.2.840.10008.5.1.4.1.1.481.8
Radio **T**herapy Ion **Beams Treatment Record** Storage	1.2.840.10008.5.1.4.1.1.481.9
Radio **T**herapy Ion **Brachy Treatment Record** Storage	1.2.840.10008.5.1.4.1.1.481.6
Radio **T**herapy Ion **Treatment Summary Record** Storage	1.2.840.10008.5.1.4.1.1.481.7

SOP Class Name	SOP Class UID
Verification (only SCP)	1.2.840.10008.1.1

Somaris/7 DICOM implementation provide Private Conformance to the following DICOM V3.0 conform Private SOP Classes as both an SCU and SCP:

SOP Class Name	SOP Class UID
CSA Non-Image Storage	1.3.12.2.1107.5.9.1

Association Establishment Policies

General

The existence of a job queue with network destination or an internal trigger from processing a retrieve request will activate the DICOM Storage Application. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the transfer is started.

The default PDU size will be 28 KB.

Number of Associations

The Somaris/7 DICOM application initiates several associations at a time, one for each destination to which a transfer request is being processed in the active job queue list.

The Somaris/7 DICOM application is able to accept multiple associations at a time. It can handle up to 10 associations in parallel.

The number of Simultaneous DICOM associations can be configured via the Service-UI. The dialog can be found in Configuration / DICOM / General.

Asynchronous Nature

The Somaris/7 DICOM application does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Implementation Class UID of

❏ “1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

❏ “SIEMENS_S7VA20A”.

Association Initiation Policy

If a job with network destination becomes active in the job list or a retrieve sub-operation is processed the Somaris/7 DICOM application attempts to initiate a new association for

- ❏ DIMSE C-STORE

service operations.

Associated Real-World Activity - Send (Storage SCU)

Associated Real-World Activity - Send Image Objects to a Network Destination

The associated Real-World activity is a C-STORE request initiated by an internal daemon process triggered by a job with network destination or the processing of an external C-MOVE retrieve request. If the process successfully establishes an association to a remote Application Entity, it will transfer each image one after another via the open association. If the C-STORE Response from the remote Application contains a status other than "Success" or "Warning", the association is aborted.

Proposed Presentation Contexts - Send Images (Storage SCU)

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Computed **R**adiography Image	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Digital **X**-Ray Image for presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Digital **X**-Ray Image for processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None

Mammo**G**raphy Image for presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Mammo**G**raphy Image for processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Digital **I**ntra**o**ral **X**-Ray Image for presentation	1.2.840.10008.5.1.4.1.1.1.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Digital **I**ntra**o**ral **X**-Ray Image for processing	1.2.840.10008.5.1.4.1.1.1.3.1	Implicit VR Little Endian Explicit VR Little Endian • Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None

Computed **T**omography Image	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Ultra**S**ound Multi-Frame Image	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Magnetic **R**esonance Image	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Ultra**S**ound Image	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None

Secondary **C**apture Image	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Waveform	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Waveform 12-lead ECG Object	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Waveform General ECG Object	1.2.840.10008.5.1.4.1.1.9.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Waveform Ambulatory ECG Object	1.2.840.10008.5.1.4.1.1.9.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Waveform Hemodynamic Object	1.2.840.10008.5.1.4.1.1.9.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Waveform Cardiac Electrophysiology Object	1.2.840.10008.5.1.4.1.1.9.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Waveform Basic Audio Object	1.2.840.10008.5.1.4.1.1.9.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
X-Ray **A**ngiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None

X-Ray **R**adio**F**luoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Nuclear **M**edicine Image	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

PET Image	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1)[a] JPEG Lossy Extended (2 & 4)[a] JPEG Lossless, Process 14 (selection value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
CSA Non-Image	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

a. The Transfer Syntax used is strongly influenced by the fact of "how was the accepted Transfer Syntax at the time when the Instance was received". e.g. the Instances received with JPEG Lossy Transfer Syntaxes will not be converted and can only be sent out with the same Transfer Syntax

Note

The proposed Transfer Syntax is highly restricted for images stored internally in lossy compressed format. E.g. instances received with JPEG Loss Transfer Syntaxes will not be converted and can only be sent out with the same Transfer Syntax.

The "MOVE" destinations must be configured as Storage destinations. This would include the configuration of Transfer Syntax capabilities.

Not all the listed transfer syntaxes will be proposed all the time. For some abstract syntaxes only a list of uncompressed (UC) transfer syntaxes (one or more) will be proposed, for other abstract syntaxes also JPEG Lossless (LL) syntax will be proposed and/or a list of JPEG Lossy (LY) transfer syntaxes. The contents of this lists is configurable, e.g. UC could be configured to contain only Implicit Little Endian for instance. For further configuration details see→ page A.5–3.

It is not possible to send an image that is locally stored in a Lossy compressed format using an uncompressed or lossless transfer syntax.

Depending on the real world activity initiating the C-STORE, we have the following behaviors:

- "if the C-STORE is initiated by a user, a configuration parameter called QualityFactor(Q) will be used to decide which transfer syntax lists will be proposed. Q can take values between 0 and 100. If Q=0, only UC will be proposed. If Q = 100, UC and LL will be proposed. Else UC and LY will be proposed.
- "if the C-STORE is initiated by the C-MOVE SCP, there is another configuration parameter called Compression Types Supported (CTS) which will be used to decide what transfer syntaxes are proposed. CTS can take integer values. If CTS=0 or CTS > 3, UC will be proposed. If CTS=1, UC and LY will be proposed. If CTS = 2, UC and LL will be proposed. If CTS >= 3, UC, LL and LY will be proposed.

The compression types JPEG lossy and JPEG lossless are parameters, which are part of the Application Entity Properties configuration (storage checked). It can by reached via the Service-UI: Configuration / DICOM / Network nodes

SOP Specific Conformance Statement - Storage SCU

The DICOM images created by Somaris/7 DICOM application conform to the DICOM IOD definitions (Standard Extended IODs). But they will contain additional private elements which have to be discarded by a DICOM system when modifying the image.

The DICOM nodes are responsible for data consistency when modifying images. All unknown private attributes have to be removed upon modification!

Somaris/7 does not change private attributes if no modification is done. But during a *Save as* operation all non *syngo* defined private attributes will be removed. For association and DIMSE level time outs refer
→ page A.5–3, *Configurable Parameters*

Association Acceptance Policy

The Somaris/7 DICOM application attempts to accept a new association for

- ☐ DIMSE C-ECHO
- ☐ DIMSE C-STORE

service operations. Any Information Object transmitted on that association will be checked for conformance and stored in the database if check was successful.

Real-World Activity - Receive (Storage SCP)

Associated Real-World Activity - Receiving Images from Remote Note (Storage SCP)

The daemon receiving process will accept an association and will receive any images transmitted on that association and will store the images on disk in the own database if the conformance check is performed successfully.

Proposed Presentation Contexts - Receiving Images (Storage SCP)

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Computed **R**adiography Image	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1)\ JPEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Digital **X**-Ray Image for presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) JPEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None

Digital **X**-Ray Image for processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Digital **M**ammo**G**raphy X-Ray Image for presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None

Digital **M**ammo**G**raphy X-Ray Image for processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Digital **I**ntra-**o**ral **X**-Ray Image for presentation	1.2.840.10008.5.1.4.1.1.1.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None

Digital **I**ntra-**o**ral **X**-Ray Image for processing	1.2.840.10008.5.1.4.1.1.1.3.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) JPEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Computed **T**omography Image	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) JPEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None

Ultra**S**ound Multi-Frame Image	1.2.840.10008.5.1.4.1.1.3.1 1.2.840.10008.5.1.4.1.1.3 (retired) *1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Magnetic **R**esonance Image	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None

Ultra**S**ound Image	1.2.840.10008.5.1.4.1.1.6.1 1.2.840.10008.5.1.4.1.1.6 (retired) ***1**	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Secondary **C**apture Image	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Waveform	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Waveform General ECG Object	1.2.840.10008.5.1.4.1.1.9.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Waveform Ambulatory ECG Object	1.2.840.10008.5.1.4.1.1.9.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None

Waveform Hemodynamic Object	1.2.840.10008.5.1.4.1.1.9.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Waveform Cardiac Electrophysiology Object	1.2.840.10008.5.1.4.1.1.9.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Waveform Basic Audio Object	1.2.840.10008.5.1.4.1.1.9.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
X-Ray **A**ngiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) JPEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
X-Ray **R**adio**F**luoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) JPEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None

Nuclear **M**edicine Image	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) JPEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.55	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

PET Image	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None

RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian JPEG Lossy Baseline (Process 1) JPEG Lossy Extended (2 & 4) JPEG Lossless, Process 14 (selection value 1) PEG Lossless, Process 14 Non-HIER JPEG 2000 Lossless JPEG 2000 Lossy RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.2	SCP	None
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
CSA Non-Image	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

***1**: US Retired and US Multiframe Retired images are converted to US images/US Multiframe images before storing them into the local database. The conversion creates new images, which implies new UIDs.

Note

With RLE Lossless Transfer Syntax and JPEG Lossless, Process14,Non_HIER Transfer Syntax the DICOM application will decompress the image before storing it into the database.

Note

JPEG 2000 decompression supported only for import in connection with COSMOS / *syngo* Imaging workplace.

Note

Private attributes in sequence items will be removed during import in *syngo*.

SOP Specific Conformance Statement - Receiving Images

The Somaris/7 DICOM application conforms to the Full Storage Service Class at Level 2.

Upon successfully receiving a C-STORE-RQ, the SIEMENS Somaris/7 DICOM receiver performs a quick plausibility test on the received image and available system resources. If this test succeeds, it returns the status SUCCESS, otherwise one of the following status codes is returned and the association is aborted:

- ❏ Refused (A700):
  This error status indicates a lack of Resources (e.g. not enough disk space) on the Somaris/7 modality.
- ❏ Invalid Dataset (A900):
  The dataset is not containing one of the attributes "Study Instance UID", "Series UID" or "SOP Instance UID", or one of them has an invalid value.
- ❏ Processing Error (0110):
  An error occurred while processing the image which makes it impossible to proceed.

Attention! Only after sending the response, the image will be saved into the database. If an error occurs during this operation, the association will be aborted. This implies that a C-STORE-RSP with status SUCCESS does not mean that the image was successfully stored into the database.

In order to confirm that the images sent were successfully stored into the database, the sending application should use Storage Commitment Service.

If an image instance is received that is identified by a SOP Instance UID which is already used by an Instance stored in the database then the received image will be discarded. The existing image is not superseded. So if a remote node sends twice the same image (same SOP Instance UID) then there will still be only one image (the first) in the database of the DICOM receiver.

The following sections will differentiate the attribute contents required for Image Viewing. The Somaris/7 DICOM application supports more formats for Storage of images than Viewing.

Image Pixel Attribute Acceptance Criterion for Grayscale Images

The Display application accepts the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format and graphic overlay with unsigned integer and 8 or 16 bits allocated. Accepted values:

Pixel plane
- samples per pixel (attribute 0028, 0002) = 1
- photometric interpretation (attribute 0028,0004) = "MONOCHROME1"
- photometric interpretation (attribute 0028,0004) = "MONOCHROME2"
- pixel representation (attribute 0028, 0103) = 0 (unsigned)
- bits allocated (attribute 0028, 0100) = 8, 16
- bits stored (attribute 0028,0101) = 8, 10, 12,14,15,16
- high bit (attribute 0028,0102) = 7,9,11
- only aspect ratio (attribute 0028,0034) 1:1 is supported

Overlay plane
- overlay type (attribute 60xx, 0040) = “G”
- overlay bits allocated (attribute 60xx, 0100) = 16
- overlay bit position (attribute 60xx, 0102) = 12, 13, 14, 15 (only bits above high bit permitted)
- Graphic Overlay will be shifted to fill Overlay Planes from Bit 12 and consecutive.

Overlay plane
- overlay type (attribute 60xx, 0040) = “G”
- overlay bits allocated (attribute 60xx, 0100) = 1
- overlay bit position (attribute 60xx, 0102) = 0
- overlay data (attribute 60xx, 3000) = supported

The Somaris/7 DICOM application accepts also the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format with binary 2’s complement integer and 16 bits allocated. Accepted values:

Pixel plane

- ☐ samples per pixel (attribute 0028, 0002) = 1
- ☐ photometric interpretation (attribute 0028,0004) = "MONOCHROME1"
- ☐ photometric interpretation (attribute 0028,0004) = "MONOCHROME2"
- ☐ pixel representation (attribute 0028, 0103) = 1 (signed)
- ☐ bits allocated (attribute 0028, 0100) = 16
- ☐ bits stored (attribute 0028,0101) = 16
- ☐ high bit (attribute 0028,0102) = 15
- ☐ only aspect ratio (attribute 0028,0034) 1:1 is supported

Overlay plane

- ☐ overlay type (attribute 60xx, 0040) = “G”
- ☐ overlay bits allocated (attribute 60xx, 0100) = 1
- ☐ overlay bit position (attribute 60xx, 0102) = 0
- ☐ overlay data (attribute 60xx, 3000) = supported

For MOD LUT both the linear LUT (Rescale Slope/Intercept) and the MOD LUT SQ are supported and considered when pixel data is displayed. However there are two limitations. The MOD LUT SQ will be ignored in the following cases:

- ☐ 8_Bit signed pixels
- ☐ The pixel format is changed by the MOD LUT (e.g. 8 bit -> 16 bit).
- ☐ If the MOD LUT SQ contains multiple LUTs then only the first one is used.

For VOI LUT also both the linear LUT (Window Center/Width) and the VOI LUT SQ are supported (VOI LUT SQ with 8 or 16 bit LUT data).

But if both a VOI LUT SQ and a linear MOD LUT are specified within one image, then the value of Rescale Slope is restricted to 1.

If the VOI LUT SQ contains multiple LUTs, then only the first one is used by default. The other VOI LUTs are selectable.

In this version the Display application supports only rectangular and circular Shutters. Images with other shutter types will be displayed without Shutter.

Image Pixel Attribute Acceptance Criterion for Color Images

The Siemens Somaris/7 Multi_Modality Viewing application supports the RGB color image description with the unsigned integer 24 bit color image plane pixel format. Accepted values:

- 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 (pixel interleave) or 1 (plane interleave)

The Siemens Somaris/7 Multi_Modality Viewing application supports the “Palette Color” color image description with unsigned integer and 2’s complement pixel format:

- samples per pixel (attribute 0028, 0002) = 1
- photometric interpretation (attribute 0028,0004) = “PALETTE COLOR”
- pixel representation (attribute 0028, 0103) = 0
- bits allocated (attribute 0028, 0100) = 8 and bits stored (attribute 0028,0101) = 8
  bits allocated (attribute 0028, 0100) = 16 and bits stored (attribute 0028,0101) = 16
- high bit (attribute 0028,0102) = 7,15

Both 8bit and 16bit palettes are supported - but no Segmented Palette Color LUTs.

The Siemens Somaris/7 Multi-Modality Viewing application supports the YBR color image description with the unsigned integer pixel format. Accepted values:

- ❏ samples per pixel (attribute 0028, 0002) = 3
- ❏ photometric interpretation (attribute 0028,0004) = “YBR_FULL” or "YBR_FULL_422"
- ❏ pixel representation (attribute 0028, 0103) = 0
- ❏ bits allocated (attribute 0028, 0100) = 8 and bits stored (attribute 0028,0101) = 8
- ❏ high bit (attribute 0028,0102) = 7

If Somaris/7 software is making any persistent changes on a YBR image, the resulting new image will be saved with Photometric Interpretation "RGB".

Presentation Context Acceptance Criterion - Storage SCP

The Somaris/7 DICOM application will accept any number of Verification or storage SOP classes that are listed above. The number of presentation contexts accepted is limited to the maximum of 127 (DICOM limit). In case the Siemens Somaris/7 DICOM application runs out of resources, it will reject the association request.

Transfer Syntax Selection Policies - Storage SCP

The Somaris/7 DICOM application supports

- the Implicit VR Little Endian, the Explicit VR Little Endian and Explicit VR Big Endian transfer syntaxes
- the JPEG Baseline and JPEG Extended transfer syntaxes (JPEG lossy)
- the JPEG lossless Non-Hierarchical transfer syntax
- the RLE Lossless Transfer Syntax
- the JPEG 2000 Lossless and Lossy Transfer Syntax

Any proposed presentation context which including one of these transfer syntaxes will be accepted. Any proposed presentation context that does not include one of these transfer syntaxes will be rejected.

The order of preference in accepting Transfer Syntaxes within Presentation Contexts or Presentation Contexts with single Transfer Syntaxes is:

1. JPEG Lossy Extended
2. JPEG Lossless Non-hierarchical
3. JPEG Lossy Baseline
4. RLE Lossless
5. Explicit VR Little Endian
6. Explicit VR Big Endian
7. Implicit VR Little Endian
8. JPEG 2000 Lossy
9. JPEG 2000 Lossless

With RLE Lossless Transfer Syntax the Somaris/7 application will decompress the image before storing it to the database.

With Implicit VR Little Endian Transfer Syntax the Somaris/7 DICOM application will remove any private attributes not known to the application. Decision on removal of a Private Element is done if there is NO entry in the attribute dictionary of the Somaris/7 DICOM application.

Thus any Explicit VR Transfer Syntax shall preferrably be used by the Storage SCUs when sending Composite Image Instances to the Somaris/7 application.

Storage Commitment AE Specification

The Somaris/7 DICOM application provides Standard Conformance to the following DICOM V3.0 SOP Classes as SCU.

SOP Class Name	SOP Class UID
Storage Commitment Push Model	1.2.840.10008.1.20.1

Association Establishment Policies

General

With a Send Job successfully completed, the DICOM application will generate a Storage Commitment Identifier which references all instances of the processed job. The Commit Request is then sent over a single opened association. Somaris/7 will wait for Status responses of the Storage Commitment Request. If the Provider accepts the Storage Commitment with Success Status, the generated Transaction UID, together with study identification data and time stamp, is kept. Depending on configuration, the association is closed when the configured time out has elapsed or a response was received before. If the association is closed before a response was received, the response is then expected on a different association. Multiple Storage Commitment Requests can be pending.

The default PDU size will be 28 KB.

Number of Associations

The Somaris/7 DICOM application initiates several association at a time, one for each destination to which a transfer request is being processed in the active job queue list.

The Somaris/7 DICOM application is able to accept multiple association at a time. It can handle up to 10 associations in parallel.

Asynchronous Nature

The Somaris/7 DICOM application does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Somaris/7 DICOM application provides the Implementation Class UID of

❏ “1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

❏ “SIEMENS_S7VA20A”.

Association Initiation Policy

The Somaris/7 Storage Commitment Application Entity acts as a Service Class User (SCU) for the

- ☐ Storage Commitment Push Model Service Class (to request commitment for storage of instances previously sent)

To do so, Somaris/7 will issue a

- ☐ N-ACTION DIMSE to request commitment or a
- ☐ N-EVENT-REPORT DIMSE to respond to a received storage commitment request and the association was closed by the remote system prior to response.

Real-World Activity - Send Storage Commitment Request

Associated Real-World Activity - Job Completed

The Somaris/7 Storage Commitment application sends the commit request (N-ACTION_RQ) message and waits for acceptance of this request (N_ACTION-RSP). After receiving this, the transaction is marked as "waiting".

Depending on a configuration value, the association will then be closed or kept open. In the first case there is another configurable timeout giving the number of hours (h) and minutes (m) (by default 1h:0m) to wait for the corresponding commit response (N_EVENT-REPORT). In the second case, this time is the (also configurable) time out for the association. For both cases, if the commit response (N-EVENT-REPORT) does not arrive during the configured time, the transaction will be marked as failed. Somaris/7 does not re-send objects because of a failed Storage Commitment result in any case.

If the commit response (N-EVENT-REPORT) received has the status of "complete - failure exists", the transaction is marked as failed, else the transaction is marked as "completed"; in both cases, a message is shown to the user.

Proposed Presentation Contexts - Job Completed

The Somaris/7 Storage Commitment AE will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

SOP Specific Conformance Statement - Job Completed

Storage Commitment is supported for all the SOP class UIDs as mentioned in table → page A.2–20.

The Referenced Study Component Sequence is not supported.

Storage Media File-Set ID and UID Attributes will not be supported in the commitment request (N-ACTION primitive) invoked by the Storage Commitment SCU.

Association Acceptance Policy

The Somaris/7 Storage Commitment AE accepts an association in this case: when acting as SCU if configured to receive N-EVENT-REPORT on a separate association.

Associated Real World Activity - Receive Storage Commitment SCU

Associated Real World Activity - Update Flags

The Somaris/7 Storage Commitment AE has sent a Storage Commitment Request and, being configured to receive response on a separate association, has closed the association, and now it gets an association request from the Storage Commitment SCP that wants to send the results. The application will wait for Storage Commitment Notification triggers. Any incoming notification will be checked for validity, that is, if the related Transaction UID is still part of the Pending Request Queue.

If the Notification is valid, the Notification Identifier is evaluated and the related Instances marked with the related status. The over all Commit Status of the higher Information Entities is derived from propagation of all Image entities included in a study.

The status flags directly affected by Storage Commitment results and indicated in the different entities of the Patient Browser list can be one of (English UI assumed):

- ❑ "AC" or "SC" - Successful Commitment. A means archived to configured archive destination, whereas S means sent to any other destination.
- ❑ "Af" or "Sf" - Commitment failed
- ❑ "A?" or "S?" - Commitment request is sent, response is pending

In case of failure the user has to repeat the transfer of images to the Archive destination. Another Storage Commitment will be performed after sending is completed successfully.

Note: The flags A (Archived) and S (Sent) respectively only indicate the receipt of the images by remote AE. They do not indicate successful storage in the intended archive. The data may be lost if it is deleted by the sender e.g., by an auto delete mechanism and if it cannot be stored by the receiver.

Source of danger: Misleading/misinterpretation of the flags AC/SC

Flags "AC" & "SC" depict receipt and storage on hard disk on the receiver side which may be not sufficient to fulfill the regulatory requirements of long-term archiving.

Consequence: Loss of data within the required period for retention.

Remedy: Sending data with the attributes AC or SC via network indicates a safe data transfer but does not fulfill the regulatory requirements of long-term archiving. Objects with the "committed" flag may be deleted by the user. Observe the regulatory requirements regarding the archiving procedure.

Accepted Presentation Contexts - Update Flags

The Somaris/7 Storage Commitment AE will accept Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

SOP Specific Conformance Statement - Receive Storage Commitment Response

If the Commitment Response (N_EVENT_REPORT) received has the status of "complete - failure exists", the transaction is marked as failed, else the transaction is marked as "completed"; In both cases, a message is shown to the user.

The related status flags are set for the committed images in the local database.

The Somaris/7 DICOM application will NOT support the Storage Media File Set ID attributes.

Query/Retrieve AE Specification

The Query/Retrieve SCU requests that the remote SCP performs a match of all keys specified in the request against the information in its database and the identified images will be moved over a different (C-MOVE) storage association.

The Query/Retrieve SCP responds to queries of the records based on its database and images will be sent to the requesting SCU or to a different storage destination.

The Somaris/7 DICOM application provides Standard Conformance to the following DICOM V3.0 SOP Classes as SCU:

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2

Somaris/7 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Patient Root Query/Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.1.3
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Study Root Query/Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.2.3
Patient/Study Only Query/ Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/ Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2
Patient/Study Only Query/ Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.3.3

Note

See also the Storage DICOM Conformance Statement (→ page A.2–19, *Association Acceptance Policy*) to compare for conformance of the C-STORE sub-operation generated by the C-MOVE and C-GET DIMSE services. Furthermore compare the supported Storage Service SOP classes described in the Storage DICOM Conformance Statement of the Modality to which the images shall be transferred to.

Association Establishment Policies

General

With the "Search..." function the query data are entered and the DICOM Query/Retrieve application is started. A query request will be sent out to one remote node that can be selected from a list of configured Query Providers and the response data will be displayed for the user. In order to provide detailed information early additional queries are sent for the more detailed levels not yet covered by the first results. Upon request (Import), the retrieval of selected items is initiated.

The default PDU size used will be 28 KB.

Number of Associations

The Somaris/7 DICOM Query/Retrieve application initiates several association at a time, one for each query/retrieve request being processed.

The Somaris/7 DICOM Query/Retrieve application is able to accept multiple associations at a time. It can handle up to 10 associations in parallel.

Asynchronous Nature

The Somaris/7 DICOM Query/Retrieve AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Somaris/7 DICOM Query AE provides the Implementation Class UID of

- ❑ “1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

- ❑ “SIEMENS_S7VA20A”.

Association Initiation Policy

The Query/Retrieve user interface will request the query data from the user and triggers C-FIND requests to the selected remote node. The response data will be displayed in the query UI for further data navigation.

When requesting Import of related items the browser requests the retrieve application to send a C_MOVE request to the related remote node. Images will then be received by the Storage SCP as described in the related section.

The following DIMSE-C operations are supported as SCU:

❏ C-FIND

❏ C-MOVE

Real-World Activity - Find SCU

Associated Real-World Activity - Find SCU "Search"

The associated Real-World activity is to fill out a query form with search data and pass it as queries to the network application which issues a C-FIND over a previously built association. The remote SCP will respond with related data entries that will be passed to a browser application. When data transfer is finished the association is closed.

Proposed Presentation Contexts - Find SCU

The Somaris/7 DICOM Query application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

Study Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian Transfer Syntax DICOM Explicit VR Little Endian Transfer Syntax DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	See Note
Patient Study only Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	DICOM Implicit VR Little Endian Transfer Syntax DICOM Explicit VR Little Endian Transfer Syntax DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	See Note

It is configurable which of the three query models are to be used by the Somaris/7 Query SCU application. If Patient and Study Root Abstract Syntaxes are configured, the C_FIND SCU will use the Patient Root Model only for C-FIND requests on PATIENT level. For all other levels it will use the STUDY Root Model.

It is highly recommended to configure only the Study Root Model if the corresponding Query SCP supports this Model. If the Query SCP does not support queries on Series Level, Patient Study Only Model should be used.

SOP Specific Conformance Statement - Find SCU

The Somaris/7 DICOM Query/Retrieve SCU supports hierarchical queries with all mandatory search keys. On each level, the unique attributes of all previous levels are also sent (values are provided by the user by selection from a list). For instance for a query using the patient root model on Series level, the Patient ID of the current selected patient and the Study Instance UID of the current selected study are included in the message. The interactive querying of attributes on IMAGE level is not supported by the Query SCU. Nevertheless, retrieval of individual Objects is possible.

The Query dialog in Somaris/7 offers search keys on different levels (Patient, Study, Series). Depending on the used Query Model (Patient Root, Study Root, Patient Study Only) the Somaris/7 DICOM Query/Retrieve SCU will execute multiple queries sequentially.

E.g. Patient Root Model:
The first query is performed on patient level with the entered patient level query keys. For each query result a new query is performed on study level with the entered study level query keys. At last for each result on study level a query is performed on series level with the entered series level keys.

The following table *Query attributes* describes the search keys for the three query models (Patient Root, Study Root and Patient Study Only) that the Somaris/7 Query/Retrieve application supports as an SCU. Matchings are either wildcard, which means that the user can supply a string containing wildcards, either universal, or means that the attribute is returned no matter what value it has.

Attribute name	Tag	Type	Matching	user input	return value displayed
Patient level[a]					
Patient name	(0010,0010)	R	wildcard[d]	enter value	yes
Patient ID	(0010,0020)	U	wildcard[d]	enter value	yes
Patient's birth date	(0010,0030)	O	universal (NULL)	enter value	yes
Patient's sex	(0010,0040)	O	universal (NULL)	enter value	yes
Number of Patient related studies	(0020,1200)	O	universal (NULL)	-	yes[b]
Number of Patient relates series	(0020,1202)	O	universal (NULL)	-	no
Number of Patient related instances	(0020,1204)	O	universal (NULL)	-	no
Study level					
Patient Name[c]	(0010,0010)	R	wildcard[d]	enter value	yes
Patient ID	(0010,0020)	R	wildcard[d]	enter value	yes
Patient's Birth date[c]	(0010,0030)	O	universal (NULL)	enter value	yes
Patient's Sex[c]	(0010,0040)	O	universal (NULL)	enter value	yes
Study Instance UID	(0020,000D)	U	single value	-	no
Study ID	(0020,0010)	R	universal (NULL)	enter value[d]	yes
Study Date	(0008,0020)	R	universal (NULL)	enter value[e]	yes

Attribute name	**Tag**	**Type**	**Matching**	**user input**	**return value displayed**
Study Time	(0008,0030)	R	universal (NULL)	-	yes
Accession Number	(0008,0050)	R	universal (NULL)	enter value[d]	yes
Study Description	(0008,1030)	O	universal (NULL)	enter value[d]	yes
Referring Physician’s name	(0008,0090)	O	universal (NULL)	enter value[d]	yes
Name of Physician Reading Study	(0008,1060)	O	universal (NULL)	enter value[d]	yes
Modalities in Study	(0008,0061)	O	universal (NULL)	enter value[d]	yes
Storage Media File Set ID	(0008,0130)	O	universal (NULL)	-	no
Retrieve AE Title	(0008,0054)	O	universal (NULL)	-	no
Number of Study related Series	(0020,1206)	O	universal (NULL)	-	yes[f]
Number of Study related instances	(0020,1208)	O	universal (NULL)	-	no
Series level					
Series Instance UID	(0020,000E)	U	single value	-	no
Series Number	(0020,0011)	R	universal (NULL)	-	yes
Modality	(0008,0060)	R	universal (NULL)	enter value	yes

Attribute name	**Tag**	**Type**	**Matching**	**user input**	**return value displayed**
Series Date	(0008,0021)	O	universal (NULL)	-	yes
Series Time	(0008,0031)	O	universal (NULL)	-	yes
Study ID	(0020,0010)	O	universal (NULL)	-	yes
Series Description	(0008,103E)	O	universal (NULL)	enter value[d]	yes
Storage Media File Set ID	(0008,0130)	O	universal (NULL)	-	yes
Retrieve AE Title	(0008,0054)	O	universal (NULL)	-	yes
Body Part Examined	(0018,0015)	O	universal (NULL)	enter value[d]	yes
Scan Options	(0018,0022)	O	universal (NULL)	-[d]	yes
Protocol name	(0018,1030)	O	universal (NULL)	-	no
Performing Physician	(0018,1050)	O	universal (NULL)	enter value[d]	yes
Performed procedure step start date	(0040,0244)	O	universal (NULL)	-	yes
Performed procedure step start time	(0040,0245)	O	universal (NULL)	-	yes
Request Attribute Sequence	(0040,0275)	O	universal (NULL)	-	yes
>Requested Procedure ID	(0040,1001)	O	universal (NULL)	-	yes

Attribute name	**Tag**	**Type**	**Matching**	**user input**	**return value displayed**
>Scheduled Procedure ID	(0040,0009)	O	universal (NULL)	-	yes
Number of series related instances	(0020,1209)	O	universal (NULL)	-	yes

Attribute name	Tag	Type	Matching	user input	return value displayed
Image Level					
SOP Instance UID	(0008,0018)	U	single value	-	no
Image Number	(0020,0013)	R	universal (NULL)	-	yes
Storage Media File Set ID	(0008,0130)	O	universal (NULL)	-	no
Retrieve AE Title	(0008,0054)	O	universal (NULL)	-	no
Instance Date	(0008,0023)	O	universal (NULL)	-	no
Instance Time	(0008,0033)	O	universal (NULL)	-	no
Number of Frames	(0028,0008)	O	universal (NULL)	-	yes
Content Date	(0008,0023)	O	single value, range matching, universal	enter value	yes
Content Time	(0008,0033)	O	single value, range matching, universal	enter value	yes
Image comments	(0020,4000)	O	universal (NULL)	-	no

Attribute name	**Tag**	**Type**	**Matching**	**user input**	**return value displayed**
Referenced Request Sequence	(0040,A370)	O	sequence matching	-	yes
> Accession Number	(0008,0050)	O	single value, universal	-	yes
> Requested Procedure ID	(0040,1000)	O	single value, universal	-	yes
Concept Name Code Sequence	(0040,A043)	O	sequence matching	enter value	yes
> Code Value	(0008,0100)	O	single value, universal, wildcard	enter value	yes
> Coding Scheme Designator	(0008,0102)	O	single value, universal, wildcard	-	yes
> Coding Scheme Version	(0008,0103)	O	single value, universal, wildcard	-	yes
> Code Meaning	(0008,0104)	O	single value, universal, wildcard	-	yes
Template Identifier	(0040,DB00)	O	single value, universal, wildcard	-	yes

Attribute name	Tag	Type	Matching	user input	return value displayed
Completion Flag	(0040,A491)	O	single value, universal, wildcard	enter value	yes
Verification Flag	(0040,A493)	O	single value, universal, wildcard	enter value	yes
Verifying Observer Sequence	(0040,A073)	O	sequence matching	enter value	yes
> Verifying Organization	(0008,A072)	O	single value, universal, wildcard	-	yes
> Verifying DateTime	(0008,A030)	O	single value, range matching, universal	enter value	yes
> Verifying Observer Name	(0008,A075)	O	single value, universal, wildcard	enter value	yes
> Verifying Observer Identification Code Sequence	(0040,A088)	O	sequence matching		yes
>> Code Value	(0008,0100)	O	single value, universal, wildcard	-	yes

Attribute name	**Tag**	**Type**	**Matching**	**user input**	**return value displayed**
>> Coding Scheme Designator	(0008,0102)	O	single value, universal, wildcard	-	yes
>> Coding Scheme Version	(0008,0103)	O	single value, universal, wildcard	-	yes
>> Code Meaning	(0008,0104)	O	single value, universal, wildcard	-	yes

a. Only for Patient Root or Patient Study Only information model
b. Implicitly visualized in the UI if no study and series search attributes have been entered
c. Only for Study Root information model
d. Always a "*" is added to the user supplied string
e. Date range possible
f. Implicitly visualized in the UI if no series search attributes have been entered

The Find SCU interprets following status codes:

C-FIND response status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None
Pending	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

Real-World Activity - Move SCU

Associated Real-World Activity - Move SCU "Import"

The operator selects a data entry in the Query UI and activates the "Import" function.

This will generate a retrieval request to the archival application which issues a C-MOVE service according to the Patient Root or Study Root query model. (The Storage Service Class Conformance Statement of the SCP describes the C-STORE service which is generated by processing the C-MOVE service.)

The transferred image data are processed as described in the storage class SCP descriptions.

The possibility to request the remote C-MOVE provider to move data to an application entity other than the C-MOVE SCU (the Somaris/7 DICOM application) is NOT used.

Proposed Presentation Contexts - Move SCU "Import"

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		
Study Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

Patient Study Only Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

Note

C-MOVE Extended Negotiation will be NOT supported by the SCU.

C-MOVE on Patient level is not supported by the application.

SOP Specific Conformance Statement - Move SCU "Import"

At association establishment time the C-MOVE presentation context shall be negotiated. The C-STORE sub-operations must be done on a different association to transfer images to the own Storage Service Class SCP.

The Move SCU interprets following status codes:

C-MOVE response status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform suboperations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
Failed	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures of Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

C-MOVE response status

Service Status	Meaning	Protocol Codes	Related Fields
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Association Acceptance Policy

The Query/Retrieve SCU and SCP establish an association by using the DICOM association services. During association establishment the Query/Retrieve application entities negotiate the supported SOP classes to exchange the capabilities of the SCU and the SCP.

The following DIMSE-C operations are supported as SCP:

- ☐ C-FIND
- ☐ C-GET
- ☐ C-MOVE
- ☐ C-FIND-CANCEL
- ☐ C-GET-CANCEL
- ☐ C-MOVE-CANCEL

Real-World Activity - Find SCP

Associated Real-World Activity - Find SCP

The associated Real-World activity is to respond to query requests to an SCU with the query model Patient Root, Study Root and Patient/Study Only. Relational retrieve operation is NOT supported. With a C-FIND-CANCEL request the running query can be cancelled at any time.

The SCP does support multiple C-FIND-requests over the same association, but not multiple C-MOVE requests.

Accepted Presentation Contexts - Find SCP

The Somaris/7 Query/Retrieve AE will accept Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note
Study Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note
Patient/Study Only Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note

Note

C-FIND Extended Negotiation will NOT be supported by the SCP.

The order of preference in accepting a Transfer syntax is:

1. Explicit VR Little Endian
2. Explicit VR Big Endian
3. Implicit VR Little Endian

SOP Specific Conformance Statement - Find SCP

The Somaris/7 DICOM Query/Retrieve SCP supports hierarchical queries with all mandatory and optional search keys.

The following six notes apply to the handling of attribute Patient’s Name (0010,0010) as Query/Retrieve SCP. The syntactical structure of Patient’s Name (0010,0010) attribute is as follows:

<single byte group>=<ideographic group>=<phonetic group>

Each group may have up to five components, which are separated by carets"^".

1. Matching of Patient’s Name attribute (0010,0010) is done case-insensitive.
2. If a search string matches the complete value of a data base object’s Patient’s Name, a match will be returned.
3. If a search string matches an individual group (single byte, ideographic or phonetic) of a data base object’s Patient’s Name, a match will be returned.
4. If a search string matches two consecutive groups of a data base object’s Patient’s Name, a match will be returned.
5. Redundant group separators "=" or component separators "^" are treated as insignificant for matching.
6. Leading and trailing blanks within a component or a group of Patient’s Name (0010,0010) are treated as insignificant for matching.

Except for the attribute Patient’s Name (0010,0010) any other query attribute contents will be treated Case Sensitive.

With wildcard queries the symbol "?" is treated as "*" by the C-FIND-SCP application. As a consequence the query string of "?abc*" will be processed as "*abc*".

If the value for the patient level unique key "Patient ID" is not known, it may be returned with zero length. The attribute "Image Comments" will not be included in the C-FIND-RSP, if it is not set in the DB, even if it was requested as return key in the related C-FIND-RQ.

Usage of Storage Media File Set ID, Retrieve AE Title with C-FIND-RSP message:

- ☐ The C-FIND SCP may return the DICOM attributes StorageMediaFileSetID (0088,0130) and StorageMediaFileSetUID (0088,0140) as empty or not at all. The Storage Media File Set ID - if existent - can be returned at Study/Series/Image Level. Only on Image Level, the values of ONLINE, NEARLINE or OFFLINE are returned to indicate the Storage Location of the related instance.
- ☐ The C-FIND SCP may return the DICOM attributes Retrieve AE Title (0008,0054) as empty or not at all. The Retrieve AE Title - if existent - can only be returned at Image Level (for Patient Root and Study Root models) or Study Level (for Patient/Study Only model).

Relational Queries are NOT supported.

A remote DICOM AE can cancel the running query by sending a C-FIND-CANCEL. Matches are possibly continuing (more C-FIND response with status PENDING) until the cancel operation has completed.

The supported attributes on the various levels of the three information models are listed in the tables of the following sections.

Patient Root Information Model

Patient level attributes, Patient Root Information ModelPatient level attributes

Attribute name	Tag	Type	Matching
Patient Name	(0010,0010)	R	single value, wildcard, universal
Patient ID	(0010,0020)	U	single value, wildcard, universal
Patient’s Birth Date	(0010,0030)	O	single value, range, universal
Patient’s Birth Time	(0010,0032)	O	single value, range, universal
Patient’s Sex	(0010,0040)	O	single value, wildcard, universal
Ethnic Group	(0010,2160)	O	single value, wildcard, universal
Patient Comments	(0010,4000)	O	wildcard, universal
Number of Patient related Studies	(0020,1200)	O	universal
Number of Patient relates Series	(0020,1202)	O	universal
Number of Patient related Instances	(0020,1204)	O	universal

Study level attributes, Patient Root Information Model

Attribute name	Tag	Usage SCU	Matching
Study Instance UID	(0020,000D)	U	single value, list of UID
Study ID	(0020,0010)	R	single value, wildcard, universal

Study level attributes, Patient Root Information Model

Attribute name	Tag	Usage SCU	Matching
Study Date	(0008,0020)	R	single value, range, universal
Study Time	(0008,0030)	R	single value, range, universal
Accession Number	(0008,0050)	R	single value, wildcard, universal
Referring Physician’s Name	(0008,0090)	O	single value, wildcard, universal
Study Description	(0008,1030)	O	single value, wildcard, universal
Admitting Diagnoses Description	(0008,1080)	O	single value, wildcard, universal
Patient’s Age	(0010,1010)	O	single value, wildcard, universal
Patient’s Size	(0010,1020)	O	single value, universal
Patient’s Weight	(0010,1030)	O	single value, universal
Additional Patient History	(0010,21B0)	O	wildcard, universal
Name of Physician reading Study	(0008,1060)	O	single value, wildcard, universal
Modalities in Study	(0008,0061)	O	multiple values, universal
Number of Study related Series	(0020,1206)	O	universal
Number of study related Instances	(0020,1208)	O	universal

Series level attributes, Patient Root Information Model

Attribute name	Tag	Usage SCU	Matching
Series Instance UID	(0020,000E)	U	single value, list of UID
Series Number	(0020,0011)	R	single value, universal
Modality	(0008,0060)	R	single value, wildcard, universal
Laterality	(0020,0060)	O	single value, wildcard, universal
Body Part Examined	(0018,0015)	O	single value, wildcard, universal
Patient Position	(0018,5100)	O	single value, wildcard, universal
Smallest Pixel Value in Series	(0028,0108)	O	single value, universal
Largest Pixel Value in Series	(0028,0109)	O	single value, universal
Protocol Name	(0018,1030)	O	single value, wildcard, universal
Series Date	(0008,0021)	O	single value, range, universal
Series Time	(0008,0031)	O	single value, range, universal
Series Description	(0008,103E)	O	single value, wildcard, universal
Operators Name	(0008,1070)	O	single value, wildcard, universal
Performing Physician’s Name	(0008,1050)	O	single value, wildcard, universal

Series level attributes, Patient Root Information Model

Attribute name	Tag	Usage SCU	Matching
Performed Procedure Step Start Date	(0040,0244)	O	universal
Performed Procedure Step Start Time	(0040,0245)	O	universal
Number of series related Instances	(0020,1209)	O	universal
Referenced Request Sequence	(0040,A370)	O	sequence matching
>Requested Procedure ID	(0040,1001)	O	single value, universal

Image level attributes, Patient Root Information Model

Attribute name	Tag	Usage SCU	Matching
SOP Instance UID	(0008,0018)	U	single value, list of UID
SOP Class UID	(0008,0016)	U	single value
Instance Number	(0020,0013)	R	single value, universal
Content Date	(0008,0023)	O	single value, range, universal
Content Time	(0008,0033)	O	single value, range, universal
Modality	(0008,0060)	O	single value, wildcard, universal
Image comments	(0020,4000)	O	universal
Concept Name Code Sequence	(0040,A043)	O	sequence matching
> Code Value	(0008,0100)	O	single value, universal, wildcard
> Coding Scheme Designator	(0008,0102)	O	single value, universal, wildcard
> Coding Scheme Version	(0008,0103)	O	single value, universal, wildcard
> Code Meaning	(0008,0104)	O	single value, universal, wildcard
Template Identifier	(0040,DB00)	O	single value, universal, wildcard
Completion Flag	(0040,A491)	O	single value, universal, wildcard
Verification Flag	(0040,A493)	O	single value, universal, wildcard

Image level attributes, Patient Root Information Model

Attribute name	Tag	Usage SCU	Matching
Verifying Observer Sequence	(0040,A073)	O	sequence matching
> Verifying Organization	(0008,A072)	O	single value, universal, wildcard
> Verifying DateTime	(0008,A030)	O	single value, range matching, universal
> Verifying Observer Name	(0008,A075)	O	single value, universal, wildcard
> Verifying Observer Identification Code Sequence	(0040,A088)	O	sequence matching
>> Code Value	(0008,0100)	O	single value, universal, wildcard
>> Coding Scheme Designator	(0008,0102)	O	single value, universal, wildcard
>> Coding Scheme Version	(0008,0103)	O	single value, universal, wildcard
>> Code Meaning	(0008,0104)	O	single value, universal, wildcard

Study Root Information Model

Study level attributes, Study Root Information Model

Attribute name	Tag	Type	Matching
Patient Name	(0010,0010)	R	single value, wildcard, universal
Patient ID	(0010,0020)	R	single value, wildcard, universal
Patient’s Birth Date	(0010,0030)	O	single value, range, universal
Patient’s Birth Time	(0010,0032)	O	single value, range, universal
Patient’s Sex	(0010,0040)	O	single value, wildcard, universal
Patient Comments	(0010,4000)	O	wildcard, universal
Number of Patient related Studies	(0020,1200)	O	universal
Number of Patient relates Series	(0020,1202)	O	universal
Number of Patient related Instances	(0020,1204)	O	universal
Study Instance UID	(0020,000D)	U	single value, list of UIDs
Study ID	(0020,0010)	R	single value, wildcard, universal
Study Date	(0008,0020)	R	single value, range, universal
Study Time	(0008,0030)	R	single value, range, universal
Accession Number	(0008,0050)	R	single value, wildcard, universal

Study level attributes, Study Root Information Model			
Attribute name	**Tag**	**Type**	**Matching**
Referring Physician's Name	(0008,0090)	O	single value, wildcard, universal
Study Description	(0008,1030)	O	single value, wildcard, universal
Admitting Diagnoses Description	(0008,1080)	O	single value, wildcard, universal
Patient's Age	(0010,1010)	O	single value, wildcard, universal
Patient's Size	(0010,1020)	O	single value, universal
Patient's Weight	(0010,1030)	O	single value, universal
Occupation	(0010,2180)	O	single value, wildcard, universal
Additional Patient History	(0010,21B0)	O	wildcard, universal
Name of Physician reading study	(0008,1060)	O	single value, wildcard, universal
Modalities in Study	(0008,0061)	O	multiple values, universal
Number of Study related Series	(0020,1206)	O	universal
Number of Study related Instances	(0020,1208)	O	universal

Series level attributes, Study Root Information Model

Attribute name	Tag	Type	Matching
Series Instance UID	(0020,000E)	U	single value, list of UID
Series Number	(0020,0011)	R	single value, universal
Modality	(0008,0060)	R	single value, wildcard, universal
Laterality	(0020,0060)	O	single value, wildcard, universal
Body Part Examined	(0018,0015)	O	single value, wildcard, universal
Patient Position	(0018,5100)	O	single value, wildcard, universal
Smallest Pixel Value in Series	(0028,0108)	O	single value, universal
Largest Pixel Value in Series	(0028,0109)	O	single value, universal
Protocol Name	(0018,1030)	O	single value, wildcard, universal
Series Date	(0008,0021)	O	single value, range, universal
Series Time	(0008,0031)	O	single value, range, universal
Series Description	(0008,103E)	O	single value, wildcard, universal
Operators Name	(0008,1070)	O	single value, wildcard, universal

Series level attributes, Study Root Information Model

Attribute name	Tag	Type	Matching
Performing Physician's Name	(0008,1050)	O	single value, wildcard, universal
Performed Procedure Step Start Date	(0040,0244)	O	universal
Performed Procedure Step Start Time	(0040,0245)	O	universal
Number of Series related Instances	(0020,1209)	O	universal

Image level attributes, Study Root Information Model

Attribute name	Tag	Type	Matching
SOP Instance UID	(0008,0018)	U	single value, list of UID
SOP Class UID	(0008,0016)	U	single value
Instance Number	(0020,0013)	R	single value, universal
Content Date	(0008,0023)	O	single value, range, universal
Content Time	(0008,0033)	O	single value, range, universal
Modality	(0008,0060)	O	single value, wildcard, universal
Image Comments	(0020,4000)	O	universal
Referenced Request Sequence	(0040,A370)	O	sequence matching
> Accession Number	(0008,0050)	O	single value, universal

Image level attributes, Study Root Information Model

Attribute name	Tag	Type	Matching
> Requested Procedure ID	(0040,1000)	O	single value, universal
Concept Name Code Sequence	(0040,A043)	O	sequence matching
> Code Value	(0008,0100)	O	single value, universal, wildcard
> Coding Scheme Designator	(0008,0102)	O	single value, universal, wildcard
> Coding Scheme Version	(0008,0103)	O	single value, universal, wildcard
> Code Meaning	(0008,0104)	O	single value, universal, wildcard
Template Identifier	(0040,DB00)	O	single value, universal, wildcard
Completion Flag	(0040,A491)	O	single value, universal, wildcard
Verification Flag	(0040,A493)	O	single value, universal, wildcard
Verifying Observer Sequence	(0040,A073)	O	sequence matching
> Verifying Organization	(0008,A072)	O	single value, universal, wildcard
> Verifying DateTime	(0008,A030)	O	single value, range matching, universal
> Verifying Observer Name	(0008,A075)	O	single value, universal, wildcard
> Verifying Observer Identification Code Sequence	(0040,A088)	O	sequence matching

Image level attributes, Study Root Information Model

Attribute name	Tag	Type	Matching
>> Code Value	(0008,0100)	O	single value, universal, wildcard
>> Coding Scheme Designator	(0008,0102)	O	single value, universal, wildcard
>> Coding Scheme Version	(0008,0103)	O	single value, universal, wildcard
>> Code Meaning	(0008,0104)	O	single value, universal, wildcard

Patient Study Only Information Models

Patient instance level, Patient Study Only Information Model

Attribute name	Tag	Type	Matching
Patient Name	(0010,0010)	R	single value, wildcard, universal
Patient ID	(0010,0020)	U	single value, wildcard, universal
Patient's Birth Date	(0010,0030)	O	single value, range, universal
Patient's Birth Time	(0010,0032)	O	single value, range, universal
Patient's Sex	(0010,0040)	O	single value, wildcard, universal
Ethnic Group	(0010,2160)	O	single value, wildcard, universal
Patient comments	(0010,4000)	O	wildcard, universal
Number of Patient related Studies	(0020,1200)	O	universal
Number of Patient relates Series	(0020,1202)	O	universal
Number of Patient related Instances	(0020,1204)	O	universal

Study level attributes, Patient Study Only Information Model

Attribute name	Tag	Type	Matching
Study Instance UID	(0020,000D)	U	single value, list of UIDs
Study ID	(0020,0010)	R	single value, wildcard, universal

Study level attributes, Patient Study Only Information Model

Attribute name	Tag	Type	Matching
Study Date	(0008,0020)	R	single value, range, universal
Study Time	(0008,0030)	R	single value, range, universal
Accession Number	(0008,0050)	R	single value, wildcard, universal
Referring Physician's Name	(0008,0090)	O	single value, wildcard, universal
Study Description	(0008,1030)	O	single value, wildcard, universal
Admitting Diagnoses Description	(0008,1080)	O	single value, wildcard, universal
Patient's Age	(0010,1010)	O	single value, wildcard, universal
Patient's Size	(0010,1020)	O	single value, universal
Patient's Weight	(0010,1030)	O	single value, universal
Occupation	(0010,2180)	O	single value, wildcard, universal
Additional Patient History	(0010,21B0)	O	wildcard, universal
Name of Physician reading Study	(0008,1060)	O	single value, wildcard, universal
Modalities in Study	(0008,0061)	O	multiple values, universal
Number of Study related Series	(0020,1206)	O	universal

Study level attributes, Patient Study Only Information Model

Attribute name	Tag	Type	Matching
Number of study related Instances	(0020,1208)	O	universal

Note

The C-FIND-RSP message will contain the following attributes:

- ❏ Specific Character Set (0008,0005) (If there is a specific character set in use).
- ❏ Query/Retrieve Level (0008,0052) from the C_FIND_RQ.
- ❏ Retrieve AE Title (0008,0054) at study, series and image level.
  This value is a list of AE titles from which the images can be retrieved. Will be NULL except for the lowest level of the query model (Image level for Patient Root or Study Root and Study level for Patient/Study Only).
- ❏ Storage-Media File-set ID (0088,0130) at level study, series and image. If Storage-Media File-set ID is not present a NULL value will be returned.
- ❏ attributes requested by C_FIND_RQ and supported by the SCP

Note

See also → page A.2–71, *SOP Specific Conformance Statement - Find SCP*

The Find SCP returns following status codes:

C-FIND return status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None
Pending	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

Real World Activity - Get SCP

Associated Real-World Activity - Get SCP

The associated Real-World activity is to respond to retrieve requests initiated from a foreign SCU. The SCP supports the query model Patient Root, Study Root and Patient/Study Only. The Storage Service Class Conformance Statement describes the C-STORE service which is generated by C-GET service. Relational retrieve operation is NOT supported.

Multiple C-GET requests over the same association are NOT supported.

Proposed Presentation Contexts - GET SCP

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Model - GET	1.2.840.10008.5.1.4.1.2.1.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note
Study Root Query/Retrieve Model - GET	1.2.840.10008.5.1.4.1.2.2.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note
Patient/Study Only Query/ Retrieve Model - GET	1.2.840.10008.5.1.4.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note

Note

C-GET Extended Negotiation will be NOT supported by the SCP.

The order of preference in accepting a Transfer syntax is:

1. Explicit VR Little Endian
2. Explicit VR Big Endian
3. Implicit VR Little Endian

SOP Specific Conformance Statement - Get SCP

At association establishment time the C-GET presentation context must be negotiated along with the C-STORE sub-operations which must be accomplished on the same association as the C-GET operation. Relational retrieve operation is NOT supported.

All unique keys have to be supplied according to the selected Query/Retrieve Level. The related tables in the C-FIND SCP section will give information about "U" marked key attributes.

Note

In DICOM wildcard queries the symbol ’?’
is treated as ’*’ by Find SCP.
So a wildcard query with "?abc*"
is actually treated as "*abc*"

The Get SCP returns following status codes:

C-MOVE return status

Service Status	**Meaning**	**Protocol Codes**	**Related Fields**
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform suboperations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures of Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Real-World Activity - Move SCP

Associated Real-World Activity - Move SCP

The associated Real-World activity is to respond to retrieve requests to an SCU. The SCP supports the query model Patient Root, Study Root and Patient/Study Only. The Storage Service Class Conformance Statement describes the C-STORE service which is generated by the C-MOVE service. Relational retrieve operation is NOT supported.

Multiple C-MOVE requests over the same association are NOT supported.

Accepted Presentation Contexts - Move SCP

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note
Study Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note
Patient/Study Only Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	See Note

Note

C-MOVE Extended Negotiation will be NOT supported by the SCP.

The order of preference in accepting a Transfer syntax is:

1. Explicit VR Little Endian
2. Explicit VR Big Endian
3. Implicit VR Little Endian

SOP Specific Conformance Statement - Move SCP

At association establishment time the C-MOVE presentation context shall be negotiated. The C-STORE sub-operations is done on a different association, specified in the C-MOVE request, to transfer images to another SCP of the Storage Service Class. Relational retrieve operation is NOT supported.

All unique keys have to be supplied according to the selected Query/Retrieve Level. The related tables in the C-FIND SCP section will give information about "U" marked key attributes.

Note

In DICOM wildcard queries the symbol '?'
is treated as '*' by Find SCP.
So a wildcard query with "?abc*"
is actually treated as "*abc*"

The Move SCP returns following status codes:

C-MOVE return status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform suboperations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
Failed	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures of Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Print AE Specification

The print management SCU (HCS) invokes print management DIMSE services to transfer images from the local AE to the remote SCP AE to print the images with the defined film format and size on a selected network DICOM hardcopy printer. See DICOM part 4 annex H. This is done in a "full-page" print mode.

Somaris/7 DICOM implementation provides Standard Conformance to the following DICOM V3.0 Basic Grayscale Print Management Meta SOP Classes as an SCU:

Basic Gray Scale Print Management Meta SOP-Classes

SOP Class Name	SOP Class UID
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
– Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
– Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
– Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
– Printer SOP Class	1.2.840.10008.5.1.1.16
– Print Job SOP Class	1.2.840.10008.5.1.1.14
– Presentation LUT SOP Class	1.2.840.10008.5.1.1.23

Color Print Management Meta SOP-Classes

SOP Class Name	SOP Class UID
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
– Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
– Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
– Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
– Printer SOP Class	1.2.840.10008.5.1.1.16
– Print Job SOP Class	1.2.840.10008.5.1.1.14

Association Establishment Policies

General

Whenever a film is completely set up and printed by command or automatism, the job is prepared for processing. As soon as the queue is ready to process the job is activated and carried out according to the processing data. The related Print application will initiate an association to the print destination and process the printing of the related information.

The default PDU size will be 28 KB.

Number of Associations

The Somaris/7 DICOM Print application initiates one association at a time for print device configured.

Asynchronous Nature

The Somaris/7 DICOM implementation does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

Implementation Class UID of

☐ “1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

☐ “SIEMENS_S7VA20A”.

Association Initiation Policy

Triggered by the Print job queue the Print Management SCU establishes an association by using the DICOM association services. With the help of the N-GET request for the printer SOP Class the Status is determined before printing.

In case no problem is encountered with the N-CREATE/N-SET Services for the related Basic Print SOP Classes the film sheet is set up for printing and the image(s) is(are) transferred to the printer device.

After the last film is printed from the queue, the Print application will leave open the association for another 60 seconds. If a new film job is ready for printing within this time limit, the job will be processed immediately over the still open association. If there is no new job, the association is closed when the time_out has elapsed. This is done to optimize automatic printing.

During the "idle time" (no open association to printer) the Print application will issue a cyclic camera status request (using N-GET of Printer SOP Class) every 5 minutes.

Real-World Activity

Associated Real-World Activity - Printing a Printer Job Queue Entry

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 set up.

The film sheet is internally processed, converted to a Standard/ 1-1 page and then the page image is sent. Status is controlled by awaiting any N-EVENT message all through 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 association is aborted.

Proposed Presentation Contexts (Presentation Context Table)

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation context - Print SCU

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Basic Grayscale Print Management Meta SOP class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Color Print Management Meta SOP class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic film session SOP class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic film box SOP class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic grayscale image box SOP class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic color image box SOP class	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Printer SOP class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Print Job SOP class	1.2.840.10008.5.1.1.14	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		
Presentation LUT SOP class	1.2.840.10008.5.1.1.23	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 Statement - Meta SOP Classes

The Somaris/7 DICOM Print Management SCU conforms to the DICOM Basic Grayscale Print Management Meta SOP Class and Basic Color Print Management Meta SOP Class.

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

- ☐ maximum number of print jobs in the queue
- ☐ maximum number of print copies
- ☐ supported film sizes of the connected DICOM SCP
- ☐ supported film formats of the DICOM SCP
- ☐ lookup table definition

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

Basic Film Session SOP Class

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

The Somaris/7 DICOM Print application 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 following attributes:

Attribute name	Tag	Usage SCU	Supported Values
Number of Copies	(2000,0010)	U	1
Medium Type	(2000,0030)	U	BLUE FILM CLEAR FILM PAPER
Film Destination	(2000,0040)	U	MAGAZINE PROCESSOR

The number of copies sent to the DICOM printer is always 1, the job is sent n times for n copies.

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

Attribute name	Tag	Source of information
Requested SOP Instance UID	(0000,1000) -> (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Basic Film Session

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

The Basic Film Session SOP class interprets the following status codes (from N-CREATE-RSP, N-DELETE-RSP messages):

Service Status	Meaning	Protocol Codes
Failure	Film session SOP instances hierarchy does not contain film box SOP instances	C600
	Unable to create print job, print queue is full	C601
	Image size is larger than images box size	C603
Warning	Memory allocation not supported	B600
	Film session printing is not supported	B601
	Film box does not contain image box (empty page)	B602
Success	Film belonging to the film session are accepted for printing	0000

Basic Film Box SOP Class

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

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

Supported as SCU are:

❏ N-CREATE

❏ N-ACTION

❏ N-DELETE

The Basic Film Box SOP class N-CREATE-RQ message uses following attributes (the used values for each attribute depend on the DICOM Printer configuration within the Somaris/7 DICOM print management SCU):

Attribute name	**Tag**	**Usage SCU**	**Supported Values**
Image Display Format	(2010,0010)	M	STANDARD\C-R
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

Attribute name	**Tag**	**Usage SCU**	**Supported Values**
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
Illumination	(2010,015E)	U	0 < Value Required if Presentation LUT is present
Reflective Ambient Light	(2010,0160)	U	0 < Value Required if Presentation LUT is present
Referenced Presentation LUT Sequence	(2050,0500)	U	

For Page Mode printing the Image Display format used is Standard\1,1. For Image Mode Printing the Image Display format used is Standard\C,R where C is the number of Columns and R is the number of Rows as specified in the Hardcopy Layout.

The N-CREATE-RSP message from the Print SCP includes the Referenced Image Box Sequence with its 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 Somaris/7 DICOM print manager will issue a N-ACTION-RQ message with the SOP Instance UID of the Basic Film Box (returned in N-CREATE-RSP of Basic Film Box SOP class) 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 SOP Class - see table below:

Attribute name	Tag	Source of information
Requested SOP Instance UID	(0000,1000) -> (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Basic Film Box

The Basic Film Box SOP class interprets the following status codes:

Service Status	Meaning	Protocol Codes
Failure	Unable to create print job; print queue is full	C602
	Image size is larger than image box size	C603
Warning	Film box does not contain image box (empty page)	B603
	Requested MinDensity or MaxDensity outside of printer’s operating range	B605
Success	Film accepted for printing	0000

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 following attributes:

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 Grayscale Image Box SOP class interprets following status codes:

Service Status	Meaning	Protocol Codes
Failure	Image contains more pixel than printer can print in Image box	C603
	Insufficient memory in printer to store the image	C605
Warning	Requested MinDensity or MaxDensity outside of printer's operating range	B605
Success		0000

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 following attributes:

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 following status codes:

Service Status	Meaning	Protocol Codes
Failure	Image contains more pixel than printer can print in Image box	C603
	Insufficient memory in printer to store the image	C605
Warning	Image size larger than image box size.	B604
Success		0000

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.

Attributes of the N_CREATE_RQ on the 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 wil 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) - see below.

Attribute name	Tag	Source of information
Requested SOP Instance UID	(0000,1000) -> (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Presentation LUT

The Presentation LUT SOP class interprets the following status codes:

Service Status	Meaning	Protocol Codes
Warning	Requested Min Density or Max Density outside the HCD´soperating range. HCD will use its respective minimum or maximum density value instead.	B605
Success	Presentation LUT successfully created	0000

Printer SOP Class

The Printer SOP Class is the possibility to monitor the status of the hardcopy printer in a synchronous and 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 can receive Events from the Print SCP asynchronously:

❏ N_GET as SCU

❏ N_EVENT_REPORT as SCU

In both cases the following information is supported:

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

Attribute name	Tag	Usage SCP	supported values
Printer Status	(2110,0010)	M	NORMAL FAILURE WARNING
Printer Status Info	(2110,0020)	M	see → page A.2–118.

For a detailed description of how Somaris/7 reacts to the various messages please refer to → page A.2–118, *DICOM Print SCU - detailed status displays*.

Print Job SOP Class

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

The Somaris/7 DICOM Print 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:

☐ N-EVENT-REPORT

Note

Somaris/7 does not support receiving N-EVENT from the camera during print sessions, normally this is configurable in the camera

The following information is supported:

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

Event type name	Event	Attributes	Tag	Usage SCU
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

For a detailed description of how Somaris/7 reacts to the various messages please refer to → page A.2–118, *DICOM Print SCU - detailed status displays*.

DICOM Print SCU - detailed status displays

The following tables document the behavior of the Somaris/7 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.

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	**Description**	**Message string visible in the 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 a film supply magazine. Films from this magazine cannot be transported into the printer.	Problem with supply magazine.	<None>/interact
CALIBRATING	Printer is performing self calibration, it is expected to be available for normal operation shortly.	Self calibration. Please wait.	**<None>/idle**
CALIBRATION ERR	An error in the printer calibration has been detected, quality of processed films may not be optimal.	Problem in calibration. Film quality may not be optimal.	<None>/interact
CHECK CHEMISTRY	A problem with the processor chemicals has been detected, quality of processed films may not be optimal.	Problem with chemistry. Film quality may not be optimal.	<None>/interact
CHECK SORTER	There is an error in the film sorter.	Error in film sorter.	<None>/interact

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *UI*/camera symbol**
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

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	Description	Message string visible in the Status Bar	Other action for *UI*/camera symbol
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
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

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	Description	Message string visible in the Status Bar	Other action for *UI*/camera symbol
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 Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	Description	Message string visible in the 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

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	Description	Message string visible in the Status Bar	Other action for *UI*/camera symbol
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
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

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	Description	Message string visible in the Status Bar	Other action for *UI*/camera symbol
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

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *UI*/camera symbol**
LOW 14x14 PAPR	The 14x14 inch paper supply magazine is low.	14x14 paper supply low.	<None>/interact
LOW 14x17	The 14x17 inch film supply magazine is low.	14x17 film supply low.	<None>/interact
LOW 14x17 BLUE	The 14x17 inch blue film supply magazine is low.	14x17 blue film supply low.	<None>/interact
LOW 14x17 CLR	The 14x17 inch clear film supply magazine is low.	14x17 clear film supply low.	<None>/interact
LOW 14x17 PAPR	The 14x17 inch paper supply magazine is low.	14x17 paper supply low.	<None>/interact
LOW 24x24	The 24x24 inch film supply magazine is low.	24x24 film supply low.	<None>/interact
LOW 24x24 BLUE	The 24x24 inch blue film supply magazine is low.	24x24 blue film supply low.	<None>/interact
LOW 24x24 CLR	The 24x24 inch clear film supply magazine is low.	24x24 clear film supply low.	<None>/interact
LOW 24x24 PAPR	The 24x24 inch paper supply magazine is low.	24x24 paper supply low.	<None>/interact
LOW 24x30	The 24x30 inch film supply magazine is low.	24x30 film supply low.	<None>/interact
LOW 24x30 BLUE	The 24x30 inch blue film supply magazine is low.	24x30 blue film supply low.	<None>/interact
LOW 24x30 CLR	The 24x30 inch clear film supply magazine is low.	24x30 clear film supply low.	<None>/interact

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *UI*/camera symbol**
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 no 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 specified for this job 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 Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *UI*/camera symbol**
PRINTER INIT	The printer is not ready at this time, it is expected to become available without intervention, For example, it may be in a normal warm-up state.	Camera initializing.	**<None>/idle**
PRINTER OFFLINE	The printer has been disabled by an operator or service person.	Camera off-line.	<None>/interact
PROC DOWN	The processor is not operating due to some unspecified reason.	Processor down.	<None>/interact
PROC INIT	The processor is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.	Processor initializing.	**<None>/idle**
PROC OVERFLOW FL	Processor chemicals are approaching the overflow full mark.	Processor chemicals overflow.	<None>/interact
PROC OVERFLOW HI	Processor chemicals have reached the overflow full mark.	Processor chemicals near overflow.	<None>/interact
QUEUED	Print job in Queue	-	**<None>/idle**
RECEIVER FULL	The Film receive magazine is full.	Receiver full.	<None>/interact

Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	Description	Message string visible in the Status Bar	Other action for *UI*/camera symbol
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

Printer Status Infos: Additional Agfa printer status infos

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
WARMING UP	Printer is in the warm-up stage. Spooling of print jobs to disk is still possible.	Camera is warming up.	**<None>idle**
OFFLINE	Printer is switched off-line. Spooling of print jobs to disk is still possible.	Camera is switched off-line.	<None>/interact
NONE	General printer warning, no specific information is available. Spooling of print jobs to disk is still possible.	-	<None>/idle

Printer Status Infos: Additional Kodak infos for Pacs Link (formerly Imation cameras)

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
SUPPLY MGZ ERR	The supply magazine has an error.	Film supply has an error.	<None>/interact

Printer Status Infos: Additional Kodak infos for Kodak 190

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
PRINTER STOPPED	The printer has stopped	Camera has stopped.	<None>/interact

Printer Status Infos: Additional Kodak infos for Kodak 190

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
FATAL ERROR	Fatal error.	Fatal error. Queue stopped.	**Queue for this camera will be STOPPED/queue stopped**

Printer Status Infos: Additional Kodak infos for 2180/1120			
Printer Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *syngo*/camera symbol**
PRINTER NOT RDY	Printer not ready.	Camera not ready.	<None>/interact
CHECK PROCESSOR	Check processor.	Check processor.	<None>/interact
NO TONER	No toner.	No toner.	<None>/interact
FATAL	Fatal error.	Fatal error. Queue stopped.	**Queue for this camera will be STOPPED/queue stopped**

Printer Status Infos: Additional Codonics infos			
Printer Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *syngo*/camera symbol**
STANDARD	Printer is ready.	Camera is ready.	**<None>/Normal**
LOAD A-SIZE	Load A-size media.	Load A-size media.	<None>/interact
LOAD A-DVPAPER	Load A-size black and white paper.	Load A-size black and white paper.	<None>/interact
LOAD A-CVPAPER	Load A-size color paper.	Load A-size color paper.	<None>/interact
LOAD A-CVTRANS	Load A-size transparencies.	Load A-size transparencies.	<None>/interact
LOAD A4-SIZE	Load A4-size media.	Load A4-size media.	<None>/interact

Printer Status Infos: Additional Codonics infos

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
LOAD A4-DVPAPER	Load A4-size black and white paper.	Load A4-size black and white paper.	<None>/interact
LOAD A4-CVPAPER	Load A4-size color paper.	Load A4-size color paper.	<None>/interact
LOAD A4-CVTRANS	Load A4-size transparencies.	Load A4-size transparencies.	<None>/interact
LOAD LA-SIZE	Load LA-size media.	Load LA-size media.	<None>/interact
LOAD LA-DVPAPER	Load LA-size black and white paper.	Load LA-size black and white paper.	<None>/interact
LOAD LA-CVPAPER	Load LA-size color paper.	Load LA-size color paper.	<None>/interact
LOAD LA-CVTRANS	Load LA-size transparencies.	Load LA-size transparencies.	<None>/interact
LOAD LA4-SIZE	Load LA4-size media.	Load LA4-size media.	<None>/interact
LOAD LA4-DVPAPER	Load LA4-size black and white paper.	Load LA4-size black and white paper.	<None>/interact
LOAD LA4-CVPAPER	Load LA4-size color paper.	Load LA4-size color paper.	<None>/interact
LOAD LA4-CVTRANS	Load LA4-size transparencies.	Load LA4-size transparencies.	<None>/interact
LOAD XLA-SIZE	Load XLA-size media.	Load XLA-size media.	<None>/interact
LOAD XLA-DVPAPER	Load XLA-size black and white paper.	Load XLA-size black and white paper.	<None>/interact

Printer Status Infos: Additional Codonics infos

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
LOAD XLA-CVPAPER	Load XLA-size color paper.	Load XLA-size color paper.	<None>/interact
LOAD XLA-CVTRANS	Load XLA-size transparencies.	Load XLA-size transparencies.	<None>/interact
LOAD XLA4-SIZE	Load XLA4-size media.	Load XLA4-size media.	<None>/interact
LOAD XLA4-DVPAPE	Load XLA4-size black and white paper.	Load XLA4-size black and white paper.	<None>/interact
LOAD XLA4-CVPAPE	Load XLA4-size color paper.	Load XLA4-size color paper.	<None>/interact
LOAD XLA4-CVTRAN	Load XLA4-size transparencies.	Load XLA4-size transparencies.	<None>/interact
LOAD XLW-SIZE	Load XLW-size media.	Load XLW-size media.	<None>/interact
LOAD XLW-DVPAPER	Load XLW-size black and white paper.	Load XLW-size black and white paper.	<None>/interact
LOAD XLW-CVPAPER	Load XLW-size color paper.	Load XLW-size color paper.	<None>/interact
LOAD 8X10-SIZE	Load 8x10 media.	Load 8x10 media.	<None>/interact
LOAD 8X10-DVFILM	Load 8x10 black and white film.	Load 8x10 black and white film.	<None>/interact
SUPPLY MISSING	The film supply magazine specified for this job is not available.	Film supply not available.	<None>/interact

Printer Status Infos: Additional Codonics infos

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
RIBBON MISSING	Ribbon is missing.	Ribbon is missing.	<None>/interact
RIBBON EMPTY	Ribbon is empty.	Ribbon is empty.	<None>/interact
TOP COVER OPEN	Top cover of printer is open.	Top cover of camera is open.	<None>/interact

Additional DICOM Execution Status Information - evaluation

Execution Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
INVALID PAGE DES	The specified page layout cannot be printed or other page description errors have been detected.	Film Job cannot be printed on this camera. Queue stopped. Please redirect film job.	**Queue for this camera will be STOPPED/Queue stopped**
INSUFFICIENT MEMORY	There is not enough memory available to complete this job.	Not enough memory available in camera. Queue stopped. Please continue queue or change camera.	**Queue for this camera will be STOPPED/Queue stopped**
NONE	General printer warning, no specific information is available. Spooling of print jobs to disk is still possible.	-	<None>/idle

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 shall be flexible.
If any other printer status info or execution status info is received, syngo will react as shown in the following table

Printer Status / Execution	Printer/ Execution Status Info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
WARNING	<any other>	<not defined status info>	Camera info: <status info>	**<None>/ interact**

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 shall be flexible.
If any other printer status info or execution status info is received, syngo will react as shown in the following table

Printer Status / Execution	Printer/ Execution Status Info	Description	Message string visible in the Status Bar	Other action for *syngo*/camera symbol
FAILURE	<any other>	<not defined status info>	Camera info: <status info> Queue stopped.	**Queue for this camera will be STOPPED/ Queue stopped**

Modality Worklist AE Specification

The Modality Worklist SCU (patient registration in conjunction with the network application) requests that the remote SCP performs a match of all keys specified in the query against the information in its worklist database.

SIEMENS Somaris/7 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCU:

SOP Class Name	SOP Class UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

Association Establishment Policies

General

It is possible to configure a cyclic update of the modality scheduler database through a background worklist request with date/ time and modality information.

In addition the user can request worklist update with "Update Worklist". No duplicate entries will be added in the Scheduler DB. Entries are uniquely identified by the Study Instance UID (0020,000D) for the Requested Procedure and the SPS ID (0040,0009) in the SPS Sequence (0040,0100).

An interactive worklist query can be issued with search criteria entered in the patient based Query dialog from the patient browser.

The default PDU size used will be 28 KB.

Number of Associations

The Somaris/7 DICOM application initiates one association at a time to query worklist entry data.

Asynchronous Nature

The Somaris/7 DICOM implementation does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

Implementation Class UID of

❏ “1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

❏ “SIEMENS_S7VA20A”.

Association Initiation Policy

The network application will (if configured) query the worklist periodically or by user request. Ever then it establishes an association by using the DICOM association services. During association establishment the negotiation of SOP classes to exchange the capabilities of the SCU and the SCP is not supported.

The following DIMSE-C operation is supported as SCU:

- ❏ C-FIND

Real-World Activity

Associated Real-World Activity - Query (Update) Worklist

A network application will perform worklist queries with the C-FIND request at regular intervals. In addition it can be triggered by immediate request. The received worklist items will be compared with the contents of the local scheduler database. New items will be inserted into scheduler database.

After each broad query all RP/SPS that were cancelled or rescheduled to another modality at the RIS will be automatically removed from the scheduler DB if

1. the Examination of this procedure has not been started or finished yet
2. the corresponding configuration item "Automatic removal of cancelled/rescheduled Request" was checked in the Service UI under DICOM / HIS/RIS Node

No automatic clean-up of the scheduler DB is performed after a Patient based Query since the worklist received does not give the complete list of all currently scheduled procedures for the modality.

Proposed Presentation Contexts - Query (Update) Worklist

The Somaris/7 DICOM application will propose Presentation Contexts as shown in the following table:

Proposed presentation contexts

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

SOP Specific Conformance Statement - Update Worklist

Search Key Attributes of the Worklist C-FIND

The Somaris/7 DICOM worklist SCU supports "broad worklist queries" with all required search keys.

The following tables describe the "broad query" search keys that the SCU supports, which is a query for all tasks scheduled for the own modality or own modality application entity defined with the following search keys:

Search Key Attributes in a broad worklist query

Attribute name[a]	Tag	Matching Key Type	query value
Scheduled Procedure Step			
Scheduled Procedure Step Sequence	(0040,0100)	R	
>Scheduled Station AE Title	(0040,0001)	R	Configurable[b]: own AET or "*"
>Scheduled Procedure Step Start Date	(0040,0002)	R	Configurable[c]: <act. Date>-<act Date> or range from UI
>Scheduled Procedure Step Start Time	(0040,0003)	R	Configurable[c]: <zero length> or range from UI
>Modality	(0008,0060)	R	Configurable[b]: own modality or "*"

[a] No other attributes of Register Dialog used for C-FIND

[b] This depend on user configuration (Options->Configuration->Patient Registration) if the "own AET" is provided or not.. use HIS/RIS Tabcard for configuration.

[c] It depends on user configuration (Options->Configuration->Patient Registration) if the actual Date with a full time range or an interactive input dialog for date/time specification is used.(<startDate>-<endDate>

Note

Since various SCP implementations depend on the Specific Character Set attribute to be sent with the C-FIND in order to deliver the attribute filled with the C-FIND-RSP (see below), as a default the attribute will be sent even if empty. In case this turns out to be a problem for a specific SCP in cooperation with Siemens this can be configured not to include this attribute.

Return Key Attributes of the Worklist C-FIND-RSP

The Somaris/7 DICOM worklist SCU supports worklist queries with return key attributes of all types. The following tables describe the return keys that the SCU supports.

An "x" in the UI column will indicate that the attribute is visualized when browsing the Worklist results with Patient Browser and/or during Patient Registration. The Patient Browser display is additionally influenced by the related Browser configuration.

A tag in the IOD column will indicate that the related attribute is included into the SOP Instances of the IODs created during processing of this worklist request.

A tag in the MPPS column will indicate that the related attribute is included into the SOP Instances of the MPPS objects created during processing of this worklist request. (See also the tables 'Performed Procedure Step N-CREATE Attributes' (pg. 150) and 'Performed Procedure Step N-SET Attributes' (pg. 154)).

Attribute name	Tag	Return Key Type	UI	IOD	MPPS	Notes
SOP Common						
Specific Character Set[a]	(0008,0005)	1C	-	(0008,0005)	(0008,0005)	
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	1				
>Modality	(0008,0060)	1	x	(0008,0060)	(0008,0060)	
>Requested Contrast Agent	(0032,1070)	2C	x	(0032,1070)		
>Scheduled Station AE Title	(0040,0001)	1	x		(0040,0241) *	*"Scheduled Station AE Title" is taken as default for "Performed Station AE Title"
>Scheduled Procedure Step Start Date	(0040,0002)	1	x			
>Scheduled Procedure Step Start Time	(0040,0003)	1	x			

Attribute name	Tag	Return Key Type	UI	IOD	MPPS	Notes
>Scheduled Procedure Step End Date	(0040,0004)	3	-			
>Scheduled Procedure Step End Time	(0040,0005)	3	-			
>Scheduled Performing Physician’s Name	(0040,0006)	1	x	(0008,1050)	(0008,1050) *	*"Scheduled Performing Physician’s Name" is taken as default for "Performing Physician’s Name"
>Scheduled Procedure Step Description	(0040,0007)	1C	x	(0040,0007) (0040,0254)	(0040,0007) (0040,0254)	*"Scheduled Procedure Step Description" is taken as default for "Performed Procedure Step Description"
>Scheduled Protocol Code Sequence**	(0040,0008)	1C	-	(0040,0008) (0040,0260) *	(0040,0008) (0040,0260) *	** Uses universal sequence match *"Scheduled Protocol Code Sequence" is taken as default for "Performed Protocol Code Sequence"
>>Code Value	(0008,0100)	1C	x			
>>Coding Scheme Designator	(0008,0102)	1C	x			
>>Coding Scheme Version	(0008,0103)	3	x			
>>Code Meaning	(0008,0104)	3	x			
>Scheduled Procedure Step ID	(0040,0009)	1	x	(0040,0009) (0040,0253)	(0040,0009) (0040,0253)	*"Scheduled Procedure Step ID" is taken as default for "Performed Procedure Step ID"
>Scheduled Station Name	(0040,0010)	2	x			
>Scheduled Procedure Step Location	(0040,0011)	2	x		(0040,0242) *	*"Scheduled Procedure Step Location" is taken as default for "Performed Procedure Step Location"

Attribute name	Tag	Return Key Type	UI	IOD	MPPS	Notes
>Pre-Medication	(0040,0012)	2C	x			
>Scheduled Procedure Step Status	(0040,0020)	3	x			
>Comments on the Scheduled Procedure Step	(0040,0400)	3	-			
Requested Procedure						
Referenced Study Sequence**	(0008,1110)	2	-	(0008,1110)	(0008,1110)	** Uses universal sequence match
>Referenced SOP Class UID	(0008,1150)	1C	-			
>Referenced SOP Instance UID	(0008,1155)	1C	-			
Study Instance UID	(0020,000D)	1	-	(0020,000D)	(0020,000D)	
Requested Procedure Description	(0032,1060)	1C	x	(0032,1060)	(0032,1060)	
Requested Procedure Code Sequence**	(0032,1064)	1C	-	(0032,1032) * (0032,1064)	(0032,1032) *	** Uses universal sequence match *"Requested Procedure Code Sequence" is taken as default for "Procedure Code Sequence"
>Code Value	(0008,0100)	1C	x			
>Code Scheme Designator	(0008,0102)	1C	x			
>Code Scheme Version	(0008,0103)	3	x			
>Code Meaning	(0008,0104)	3	x			
Requested Procedure ID	(0040,1001)	1	x	(0040,1001) (0020,0010) *	(0040,1001) (0020,0010) *	*"Requested Procedure ID" is taken as default for "Study ID"
Reason for the Requested Procedure	(0040,1002)	3	-			
Requested Procedure Priority	(0040,1003)	2	x			

Attribute name	Tag	Return Key Type	UI	IOD	MPPS	Notes
Patient Transport Arrangements	(0040,1004)	2	-			
Requested Procedure Location	(0040,1005)	3	-			
Confidentiality Code	(0040,1008)	3	-			
Reporting Priority	(0040,1009)	3	-			
Names of Intended Recipients of results	(0040,1010)	3	-	(0008,1048)		
Requested Procedure Comments	(0040,1400)	3	x			
Reason for the Requested Procedure Code Sequence	(0040,100A)	3	-			
Imaging Service Request						
Accession Number	(0008,0050)	2	x	(0008,0050)	(0008,0050)	
Referring Physician’s Name	(0008,0090)	2	x	(0008,0090)		
Requesting Physician	(0032,1032)	2	x	(0032,1032)	(0032,1032)	
Requesting Service	(0032,1033)	3	x	(0032,1033)		
Reason for the Imaging Service Request	(0040,2001)	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	-		(0040,2016)	*Old tag (0040,2006) is retired and not used
Filler Order Number / Imaging Service Request*	(0040,2017)	3	-		(0040,2017)	*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	-			

Attribute name	Tag	Return Key Type	UI	IOD	MPPS	Notes
Imaging Service Request Comments	(0040,2400)	3	x			
Visit Identification						
Institution Name	(0008,0080)	3	x	(0008,0080)		
Institution Address	(0008,0081)	3	-	(0008,0081)		
Institution Code Sequence**	(0008,0082)	3	-			** Uses universal sequence match
>Code Value	(0008,0100)	1C				
>Code Scheme Designator	(0008,0102)	1C				
>Code Scheme Version	(0008,0103)	3				
>Code Meaning	(0008,0104)	3				
Admission ID	(0038,0010)	2	x			
Issuer of Admission ID	(0038,0011)	3	-			
Visit Status						
Visit Status ID	(0038,0008)	3	-			
Current Patient Location	(0038,0300)	2	x			
Patient's Institution Residence	(0038,0400)	3	-			
Visit Comments	(0038,4000)	3	-			
Visit Relationship						
Referenced Study Sequence**	(0008,1110)	3	-			** Uses universal sequence match
>Referenced SOP Class UID	(0008,1150)	1C	-			
>Referenced SOP Instance UID	(0008,1155)	1C	-			
Referenced Patient Sequence**	(0008,1120)	2	-		(0008,1120)	** Uses universal sequence match
>Referenced SOP Class UID	(0008,1150)	1C	-			
>Referenced SOP Instance UID	(0008,1155)	1C	-			

Attribute name	Tag	Return Key Type	UI	IOD	MPPS	Notes
Visit Admission						
Referring Physician’s Name	(0008,0090)	2	x	(0008,0090)		
Referring Physician’s Address	(0008,0092)	3	-			
Referring Physician’s Phone Numbers	(0008,0094)	3	-			
Admitting Diagnoses Description	(0008,1080)	3	x	(0008,1080)		
Admitting Diagnosis Code Sequence**	(0008,1084)	3				** Uses universal sequence match
>Code Value	(0008,0100)	1C				
>Code Scheme Designator	(0008,0102)	1C				
>Code Scheme Version	(0008,0103)	3				
>Code Meaning	(0008,0104)	3				
Route of Admissions	(0038,0016)	3	-			
Admitting Date	(0038,0020)	3	-			
Admitting Time	(0038,0021)	3	-			
Patient Identification						
Patient’s Name	(0010,0010)	1	x	(0010,0010)	(0010,0010)	
Patient ID	(0010,0020)	1	x	(0010,0020)	(0010,0020)	
Issuer of Patient ID	(0010,0021)	3	-	(0010,0021)		
Other Patient IDs	(0010,1000)	3	x	(0010,1000)		
Other Patient Names	(0010,1001)	3	x	(0010,1001)		
Patient’s Birth Name	(0010,1005)	3	-	(0010,1005)		
Patient’s Mother’s Birth Name	(0010,1060)	3	-	(0010,1060)		
Medical Record Locator	(0010,1090)	3	-	(0010,1090)		
Patient Demographic						
Patients Birth Date	(0010,0030)	2	x	(0010,0030)	(0010,0030)	
Patients Birth Time	(0010,0032)	3	-	(0010,0032)		

Attribute name	**Tag**	**Return Key Type**	**UI**	**IOD**	**MPPS**	**Notes**
Patient's Sex	(0010,0040)	2	x	(0010,0040)	(0010,0040)	
Patient's Insurance Plan Code Sequence**	(0010,1050)	3	-	(0010,1050)		** Uses universal sequence match
>Code Value	(0008,0100)	1C				
>Code Scheme Designator	(0008,0102)	1C				
>Code Scheme Version	(0008,0103)	3				
>Code Meaning	(0008,0104)	3				
Patient's Age	(0010,1010)	3	x	(0010,1010)		
Patient's Size	(0010,1020)	3	x	(0010,1020)		
Patient's Weight	(0010,1030)	2	x	(0010,1030)		
Patient's Address	(0010,1040)	3	x	(0010,1040)		
Military Rank	(0010,1080)	3	x	(0010,1080)		
Branch of Service	(0010,1081)	3	-	(0010,1081)		
Country of Residence	(0010,2150)	3	-	(0010,2150)		
Region of Residence	(0010,2152)	3	-	(0010,2152)		
Patient's Telephone Numbers	(0010,2154)	3	-	(0010,2154)		
Ethnic Group	(0010,2160)	3	x	(0010,2160)		
Occupation	(0010,2180)	3	-	(0010,2180)		
Patient's Religious Preference	(0010,21F0)	3	-	(0010,21F0)		
Patient Comments	(0010,4000)	3	x	(0010,4000)		
Patient Data Confidentality Constraint Description	(0040,3001)	2	x	(0040,3001)		
Patient Medical						
Medical Alerts	(0010,2000)	2	x	(0010,2000)		
Contrast Allergies	(0010,2110)	2	x	(0010,2110)		
Pregnancy Status	(0010,21C0)	2	x	(0010,21C0)		
Smoking Status	(0010,21A0)	3	x	(0010,21A0)		

Attribute name	Tag	Return Key Type	UI	IOD	MPPS	Notes
Last Menstrual Date	(0010,21D0)	3	x	(0010,21D0)		
Additional Patient History	(0010,21B0)	3	x	(0010,21B0)		
Special Needs	(0038,0050)	2	x	(0038,0050)		
Patient State	(0038,0500)	2	x	(0038,0500)		
Patient Relationship						
Referenced Study Sequence**	(0008,1110)	3	-			** Uses universal sequence match
>Referenced SOP Class UID	(0008,1150)	1C	-			
>Referenced SOP Instance UID	(0008,1155)	1C	-			
Referenced Visit Sequence**	(0008,1125)	3	-			** Uses universal sequence match
>Referenced SOP Class UID	(0008,1150)	1C	-			
>Referenced SOP Instance UID	(0008,1155)	1C	-			
Referenced Patient Alias Sequence**	(0038,0004)	3	-			** Uses universal sequence match
>Referenced SOP Class UID	(0008,1150)	1C	-			
>Referenced SOP Instance UID	(0008,1155)	1C	-			

a. The Specific Character Set distributed via Modality Worklist by the hospital network shall reflect the global hospital context, e.g. a hospital with german context shall not restrict the worklist entries to ISO_IR 6 but supply a character set adequate to hold all german language text input.

Associated Real-World Activity - Get Worklist

With "Get Worklist" in the patient based Worklist Query dialog the entered attributes are used to form a worklist request identifier. With the response data the Patient Registration dialog can be updated to perform examination in advance. The response data are additionally placed in the scheduler database.

Proposed Presentation Contexts - Get Worklist

The same Presentation contexts as with "Update Worklist" will be proposed.

SOP Specific Conformance - Get Worklist

Search Key Attributes of the Worklist C-FIND

The Somaris/7 DICOM worklist SCU supports "narrow worklist queries" with all required search keys.

The following table describes the search keys that the SCU supports for a patient based worklist query, which is defined by the following search keys

Attribute name	Tag	Matching Key Type	query value
Scheduled Procedure Step			
Scheduled Procedure Step Sequence	(0040,0100)	R	
>Scheduled Performing Physician’s Name	(0040,0006)	R	inserted in UI or zero length
Requested Procedure			
Requested Procedure ID	(0040,1001)	O	inserted in UI or zero length
Imaging Service Request			
Accession Number	(0008,0050)	O	inserted in UI or zero length
Referring Physician’s Name	(0008,0090)	O	inserted in UI or zero length
Visit Status			

Attribute name	Tag	Matching Key Type	query value
Current Patient Location	(0038,0300)	O	inserted in UI or zero length
Patient Identification			
Patient's Name[a]	(0010,0010)	R	inserted in UI or zero length
Patient ID	(0010,0020)	R	inserted in UI or zero length

[a] Please be aware that although in the UI there are different entries for First Name and Last Name of a patient these are combined into one query attribute. Querying just for the Last Name (without wildcard) or not providing a first letter for the First Name may prevent expected matches.

Return Key Attributes used from the Worklist C-FIND-RSP

Please see table → page A.2–144.

Status Codes of the Worklist C-FIND

The worklist SCU interprets following status codes:

Service Status	Meaning	Status Codes (0000,0900)	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None

Service Status	Meaning	Status Codes (0000,0900)	Related Fields
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

Modality Performed Procedure Step AE Specification

The Modality Performed Procedure Step SCU (Patient Registration and MPPS UI) provide information about a performed real-world Procedure to a remote SCP (Information System).

SIEMENS Somaris/7 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCU:

SOP Class Name	SOP Class UID
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3

Association Establishment Policies

General

The creation of a MPPS Instance is done automatically by the Somaris/7 DICOM application whenever a patient is registered for image acquisition through the Patient Registration dialog. Exception: In case of Emergency Patients the MPPS is created only when the user explicitly sends a corresponding message from the MPPS user interface.

Further updates on the MPPS data can be done interactively from the related MPPS user interface. The MPPS "Complete" or "Discontinued" states can only be set from user interface.

The default PDU size used will be 28 KB.

Number of Associations

The Siemens DICOM application initiates one association at a time to create or set MPPS instance.

Asynchronous Nature

The Siemens DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

Implementation Class UID of

- “1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

- “SIEMENS_S7VA20A”.

Association Initiation Policy

The Somaris/7 DICOM Application Entity acts as a Service Class User (SCU) for the Modality Performed Procedure Step Service Class (to notify a RIS about status of a procedure while it is performed).

To do so, it will issue a:

❑ N-CREATE DIMSE according to the CREATE Modality Performed Procedure Step SOP Instance operation
or a

❑ N-SET DIMSE to update the contents and state of the MPPS according to the SET Modality Performed Procedure Step Information operation

Real World Activity

Associated Real-World Activity - Patient Registered

A patient is registered by the Patient Registration "Exam" action. From this event the trigger to create a MPPS Instance is derived. The related Instance is then immediately communicated to the configured RIS system. An association is established and the MPPS Instance is sent.

Proposed Presentation Contexts - Patient Registered

The Siemens DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

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

SOP Specific Conformance Statement - Patient Registered

Attributes used for the Performed Procedure Step N-CREATE

The Siemens DICOM Modality Performed Procedure Step SCU informs the remote SCP when the examination of a scheduled procedure step will be performed (i.e. the patient is registered). The N-CREATE message is sent when the examination is started with successful registration of patient data. The following table describes the supported attributes for a N-CREATE message.

Performed Procedure Step N-CREATE Attributes

Attribute name	Tag	Required Type	Value
SOP Common			
Specific Character Set	(0008,0005)	1C	from MWL or created
Performed Procedure Step Relationship			
Scheduled Step Attribute Sequence	(0040,0270)	1	
>Study Instance UID	(0020,000D)	1	from MWL or created
>Referenced Study Sequence	(0008,1110)	2	from MWL or zero length
>>Referenced SOP Class UID	(0008,1150)	1C	
>>Referenced SOP Instance UID	(0008,1155)	1C	
>Accession Number	(0008,0050)	2	from MWL or user input
>Placer Order Number / Imaging Service Request	(0040,2016)	3	from MWL or zero length
>Filler Order Number / Imaging Service Request	(0040,2017)	3	from MWL or zero length
>Requested Procedure ID	(0040,1001)	2	from MWL or user input
>Requested Procedure Description	(0032,1060)	2	from MWL or zero length

Performed Procedure Step N-CREATE Attributes			
Attribute name	**Tag**	**Required Type**	**Value**
>Scheduled Procedure Step ID	(0040,0009)	2	from MWL or zero length
>Scheduled Procedure Step Description	(0040,0007)	2	from MWL or zero length
>Scheduled Protocol Code Sequence	(0040,0008)	2	from MWL or zero length
>>Code Value	(0008,0100)	1C	
>>Coding Scheme Designator	(0008,0102)	1C	
>>Code Scheme Version	(0008,0103)	3	
>>Code Meaning	(0008,0104)	3	
Patient’s Name	(0010,0010)	2	from MWL or user input
Patient ID	(0010,0020)	2	from MWL or user input or created
Patients Birth Date	(0010,0030)	2	from MWL or user input
Patient’s Sex	(0010,0040)	2	from MWL or user input
Referenced Patient Sequence	(0008,1120)	2	from MWL or zero length
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Performed Procedure Step Information			
Performed Procedure Step ID	(0040,0253)	1	from SPS ID or created
Performed Station AE Title	(0040,0241)	1	own AE Title
Performed Station Name	(0040,0242)	2	own hostname

Performed Procedure Step N-CREATE Attributes

Attribute name	Tag	Required Type	Value
Performed Location	(0040,0243)	2	from SPS Location or zero length
Performed Procedure Step Start Date	(0040,0244)	1	created
Performed Procedure Step Start Time	(0040,0245)	1	created
Performed Procedure Step Status	(0040,0252)	1	IN PROGRESS
Performed Procedure Step Description	(0040,0254)	2	from SPS Description or zero length
Performed Procedure Type Description	(0040,0255)	2	zero length
Procedure Code Sequence	(0008,1032)	2	from Requested Procedure Code or zero length
>Code Value	(0008,0100)	1C	
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	3	
>Code Meaning	(0008,0104)	3	
Performed Procedure Step End Date	(0040,0250)	2	zero length
Performed Procedure Step End Time	(0040,0251)	2	zero length
Image Acquisition Results			
Modality	(0008,0060)	1	CT
Study ID	(0020,0010)	2	from Requested Procedure ID or created

Performed Procedure Step N-CREATE Attributes			
Attribute name	**Tag**	**Required Type**	**Value**
Performed Protocol Code Sequence	(0040,0260)	2	from Scheduled Protocol Code SQ or zero length
>Code Value	(0008,0100)	1C	
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	3	
>Code Meaning	(0008,0104)	3	
Performed Series Sequence	(0040,0340)	2	
>Performing Physicians's Name	(0008,1050)	2C	from MWL or user input
>Protocol Name	(0008,1030)	n/a	User-defined description of the conditions under which the Series was performed
>Operator's Name	(0008,1070)	2C	user input
>Series Instance UID	(0020,000E)	1C	created
>Series Description	(0008,103E)	2C	zero length
>Retrieve AE Title	(0008,0054)	2C	zero length
>Referenced Image Sequence	(0008,1140)	2C	zero length
>Referenced Standalone SOP Instance Sequence	(0040,0220)	2C	zero length
Radiation Dose Module			
DistanceSourceToDetector	(0040,0301)	3	created
DistanceSourceToEntrance	(0040,0306)	3	zero length

Performed Procedure Step N-CREATE Attributes			
Attribute name	**Tag**	**Required Type**	**Value**
TotalNumberOfExposures	(0040,0301)	3	created
CommentsOnRadiationDose	(0040,0310)	3	created
Exposure Dose Sequence	(0040,030E)	3	created
Billing And Material Management Code Module			
Billing Supplies and Devices Sequence	(0040,0324)	3	created
Quantity Sequence	(0040,0293)	3	created

Status Codes of the Performed Procedure Step N-CREATE

The Performed Procedure Step SCU interprets the following status values:

N-SET Response Status

Service Status	Meaning	Status Codes (0000,0900)
Failure	Processing Failure	0110
	No such attribute	0105
	Invalid attribute value	0106
	Duplicate SOP Instance	0111
	No such SOP Instance	0112
	No such SOP class	0118
	Class instance conflict	0119
	Missing attribute	0120
	Missing attribute value	0121
	Resource limitation	0213
Success	Successful Operation	0000

Associated Real-World Activity - UI-Update

The associated Real-World activity is to send examination information to an SCP by using the DICOM Modality Performed Procedure Step Service either implicitly (examination) or explicitly (MPPS UI).

Proposed Presentation Contexts -UI- Update

The same Presentation Contexts as in → page A.2–157 will be proposed.

SOP Specific Conformance Statement - UI-Update

Attributes used for the Performed Procedure Step N-SET

The Somaris/7 DICOM Performed Procedure Step SCU informs the remote SCP about the performed examination and its status. The N-Set message is sent once for each reconstruction of acquisition data with status "IN_PROGRESS". The N-SET message is sent on user input with status "COMPLETED" or "DISCONTINUED", respectively. This is intended to be used when the examination is finished with status "COMPLETED" or when the examination could not be completed with status "DISCONTINUED" (already sent automatically when examination is ended via End Exam and no acquisition was done). The following table describes the supported attributes for a N-SET message.

Performed Procedure Step N-SET Attributes

Attribute name	Tag	Required Type	Value
Performed Procedure Step Information			
Performed Procedure Step Status	(0040,0252)	3	IN_PROGRESS or COMPLETED or DISCONTINUED (see above)
Performed Procedure Step Description	(0040,0254)	3	from SPS Description or user input
Performed Procedure Type Description	(0040,0255)	3	zero length
Procedure Code Sequence	(0008,1032)	3	from Requested Procedure Code or empty on user change (see IHE Technical Framework Y3, App. C Note 6)
>Code Value	(0008,0100)	1C	

Performed Procedure Step N-SET Attributes			
Attribute name	**Tag**	**Required Type**	**Value**
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	3	
>Code Meaning	(0008,0104)	3	
Performed Procedure Step End Date	(0040,0250)	1	created
Performed Procedure Step End Time	(0040,0251)	1	created
Image Acquisition Results			
Performed Protocol Code Sequence	(0040,0260)	3	from Scheduled Protocol Code SQ or user input
>Code Value	(0008,0100)	1C	
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
Performed Series Sequence	(0040,0340)	1	
>Performing Physicians's Name	(0008,1050)	2C	from MWL or user input [empty if Study Split is used]
>Protocol Name	(0018,1030)	1C	name of Scan Protocol (Siemens standard or user defined) [dummy if Study Split is used]
>Operator's Name	(0008,1070)	2C	user input [empty if Study Split is used]
>Series Instance UID	(0020,000E)	1C	created [dummy if Study Split is used]

Performed Procedure Step N-SET Attributes			
Attribute name	**Tag**	**Required Type**	**Value**
>Series Description	(0008,103E)	2C	range name with generated reconstruction information or user input [empty if Study Split is used]
>Retrieve AE Title	(0008,0054)	2C	from Storage Commitment RSP or zero length
>Referenced Image Sequence	(0008,1140)	2C	created [empty if Study Split is used]
>>Referenced SOP Class UID	(0008,1150)	1C	
>>Referenced SOP Instance UID	(0008,1155)	1C	
>Referenced Standalone SOP Instance Sequence	(0040,0220)	2C	zero length
Radiation Dose			
Total Number of Exposures	(0040,0301)	3	created (number of scans)
Distance Source to Detector (SID)	(0018,1110)	3	created
Distance Source to Entrance	(0040,0306)	3	created
Comments on Radiation Dose	(0040,0310)	3	created (one line per scan)[a]
Exposure Dose Sequence	(0040,030E)	3	created
>Radiation Mode	(0018,115A)	3	created
>KVp	(0018,0060)	3	created
>X-ray Tube Current in uA	(0018,8151)	3	created
>Exposure Time	(0018,1150)	3	created

Performed Procedure Step N-SET Attributes			
Attribute name	**Tag**	**Required Type**	**Value**
>Filter Type	(0018,1160)	3	"WEDGE"
Billing and Material Management Code			
Film Consumption Sequence	(0040,0321)	3	created or zero length
>Number of Films	(2100,0170)	3	
>Medium Type	(2000,0030)	3	
>Film Size ID	(2010,0050)	3	
Billing Supplies and Devices Sequence	(0040,0324)	3	user input in Examination Card (example values below) or MPPS window
>Billing Item Sequence	(0040,0296)	3	
>>Code Value	(0008,0100)	1C	e.g. contrast media code
>>Code Scheme Designator	(0008,0102)	1C	e.g. contrast media catalog
>>Code Meaning	(0008,0104)	1C	e.g. contrast media name
>Quantity Sequence	(0040,0293)	1C	
>>Quantity	(0040,0294)	3	e.g. volume of contrast media
>>Measuring Units Sequence	(0040,0295)	3	
>>>Code Value	(0008,0100)	1C	e.g. cm3
>>>Code Scheme Designator	(0008,0102)	1C	e.g. UCUM
>>>Code Scheme Version	(0008,0103)	1C	e.g. 1.4
>>>Code Meaning	(0008,0104)	1C	e.g. cm3

a. The following format is used:
RangeName: kV=xxx mAs=xxx CTDIvol=xxx DLP=xxx
DualTube: kV=xxx/yyy mAs=xxx CTDIvol=xxx DLP=xxx
CTDIvol and DLP is not provided for Topogram scans.

Status Codes of the Performed Procedure Step N-SET

The Performed Procedure Step SCU interprets the following status values:

N-SET Response Status

Service Status	Meaning	Status Codes (0000,0900)
Failure	Processing Failure: Performed Procedure Step Object may no longer be updated	0110
	No such attribute	0105
	Invalid attribute value	0106
	No such SOP Instance	0112
	Invalid object instance	0117
	No such SOP class	0118
	Class instance conflict	0119
	Missing attribute value	0121
	Resource limitation	0213
Success	MPPS instance set	0000

CHAPTER
A.3

Communication Profiles

Supported Communication Stacks

The Somaris/7 DICOM application provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

The product target operating system is Windows XP.

OSI Stack

Not supported.

TCP/IP Stack

The Somaris/7 DICOM application uses the TCP/IP stack from the Windows XP system. It uses the MergeCOM-3 subroutine library from Merge Technologies Inc. that is based on a Berkeley socket interface.

API

The Somaris/7 DICOM application uses the MergeCOM library that is based on a TCP/IP socket interface.

Physical Media Support

The Somaris/7 DICOM application is indifferent to the physical medium over which TCP/IP executes. It inherits it from the target operating system upon which it executes.

Point-to-Point Stack

Not supported.

CHAPTER
A.4

Extensions/Specializations/ Privatizations

Standard Extensions

Standard Extensions of all SOP Classes

The following tables list the data dictionary of all DICOM IOD attributes where the DICOM standard definitions are extended:

Attribute Name	Tag	Private Creator	Type	Notes
Image Type	(0008,0008)	-	1	see → page A.4–6, Image Type additional Defined Terms: Defined Terms for value 3: OTHER MPR PROJECTION IMAGE UNDEFINED Defined Terms for value 4: CSA *[a] CT_SOM4 * CT_SOM5 *[b] CT_SOM6 * CT_SOM7 * ECAT * SHS * Somaris/7 based SOMATOM products provide a value 5 with the Defined Terms: ADD CTL FINISHED IN_WORK MRTD OTOM OTOP PBF PBV PKET PMON STD TTP TTS AVG, MIP, CBF, CBFI,CBFA, PEAK,

Attribute Name	Tag	Private Creator	Type	Notes
				CBV, CBVP,CBVA BV, BVP, TTSA MTTA, PMBP RSQP,CSQP, RSDP,CSDP, ALP
				Somaris/7 based SOMATOM products provide a value 6 with the Defined Terms: DNRG SNRG Somaris/7 based SOMATOM products provide a value 7 with the Defined Terms: DET_A DET_B DET_AB
Patient Position	(0018,5100)	-	2C	Additional Defined Terms for the Magnetom Open: HLS HLP FLS FLP HLDL HLDR FLDL FLDR

Attribute Name	Tag	Private Creator	Type	Notes
Body Part Examined	(0018,0015)		3	Additinal Defined Terms for the Somaris/7 based SOMATOM products: SPINE SPECIAL UNKNOWN SERVICE see → page A.4–14, Body Part Examined for further explanation

a. For terms beginning with the stated prefix, e. g. "CSA", and ending with a "*" see → page A.4–6, Image Type.

b. For private extensions see page → page A.4–52, Private Elements for Storage SOP Classes.

All SOP classes may contain additional type 3 attributes which DICOM standard defines in a different DICOM IOD or DICOM SOP class (attributes from Normalized SOP classes).

This is the case for example for

☐ Rescale Slope (0028,1053)

☐ Rescale Intercept (0028,1052)

which are also used in the MR IOD.

Image Type

The Image Type (0008,0008) attribute identifies important image identification characteristics. These characteristics are:

1. Pixel Data Characteristics:
- Is the image an ORIGINAL Image; an image whose pixel values are based on original or source data, or
- is the image a DERIVED Image; an image whose pixel values have been derived in some manner from the pixel value of one or more other images.

2. Patient Examination Characteristics:
- Is the image a PRIMARY Image; an image created as a direct result of the Patient examination, or
- is the image a SECONDARY Image; an image created after the initial Patient examination.

3. Modality Specific Characteristics (SOP Specific Characteristics).

4. Implementation specific identifiers; other implementation specific identifiers shall be documented in an implementation's conformance claim.

The Image Type attribute is multi-valued and shall be provided in the following manner:

- Value 1 shall identify the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
  - ORIGINAL = identifies an Original Image
  - DERIVED = identifies a Derived Image
- Value 2 shall identify the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
  - PRIMARY = identifies a Primary Image
  - SECONDARY = identifies a Secondary Image
- Value 3 shall identify any Image IOD specific specialization, the following terms are defined in addition to the DICOM standard definitions:
  - OTHER = converted non-Axial and non-Localizer CT images; images of no special type (new syntax)
  - UNDEFINED = images of no special type (old syntax)

- ❑ **Value 4** is implementation specific. The following terms are defined:
  - ❑ original *syngo* generated data set types:

    CSA 3D EDITOR = object created by 3D Editor
    CSA 3D FLY PATH = object created by Fly Through Path
    CSA 3D FLY VRT = object created by Fly Through Volume Rendering Technique
    CSA 3D FUSION = object created by Fusion
    CSA AVERAGE = image was created by Average
    CSA BLACK IMAGE = SC Image with black pixels, only graphics information is of interest
    CSA BOOKMARK = InSpace generated SC image containing bookmark information
    CSA RESAMPLED = derived image created by zooming or panning original image
    CSA REPORT = *syngo* Reporting (documentation of diagnosis)
    CSA RESULT = *syngo* Reporting (post processing results)
    CSA MIP = image created by Maximum Intensity Projection
    CSA MIP THIN = image created by Maximum Intensity Projection
    CSA MIP THIN CV = image created by Maximum Intensity Projection (curved cut)
    CSA MPR = image created by Multi Planar Reconstruction
    CSA MPR CV = image created by Multi Planar Reconstruction (curved cut)
    CSA MPR THICK = image created by Multi Planar Reconstruction
    CSA MPR THICK CV = image created by Multi Planar Reconstruction (curved cut)
    CSA MPR THIN = image created by Multi Planar Reconstruction
    CSA PSSD = SC image as Perspective Shaded Surface Display
    CSA SSD = SC Image as Shaded Surface Display
    CSA SUBTRACT = image was created by Subtraction
    CSA VRT = SC Image created by Volume Rendering Technique
    ECAT ACF = CTI PET Attenuation Correction
    ECAT NORMAL = CTI PET Normalization
    ECAT 3D SINO = CTI PET 3D Sinogram Short

ECAT 3D SINO FLT = CTI PET 3D Sinogram Float

additional image types generated by Somaris/7 or Somaris/5 based SOMATOM products:
CT_SOM7 PCT= PerfusionCT Image
CT_SOM5 AVE = Averaged Image
CT_SOM5 ICD = Interventional Cine Display Image
CT_SOM5 MON = Monitoring Image
CT_SOM5 MUL = Multiscan Image
CT_SOM5 PAR = Parameter Image
CT_SOM5 PROT = Protocol Image
CT_SOM5 ROT = ROT Image
CT_SOM5 RTD = Real Time Display Image
CT_SOM5 RTD DUAL = Common Somaris/7 Dual Tube Real Time Display Image
CT_SOM7 RTD DUAL = Specific Somaris/7 Dual Tube Real Time Display Image
CT_SOM5 SEQ = Sequence Image
CT_SOM5 SEQ DUAL = Somaris/7 Dual Tube Sequence Image
CT_SOM5 SPI = Spiral Image
CT_SOM5 SPI DUAL = Somaris/7 Dual Tube Spiral Image
CT_SOM7 SPI DUAL = Specific Somaris/7 Dual Tube Spiral Image
CT_SOM5 SPO = Spiral Oblique Image
CT_SOM5 STA = Static Image
CT_SOM5 SUB = Subtracted Image
CT_SOM5 TOP = Topogram
CT_SOM5 DPAN = Dental Panorama Rebuilt Tomogram
CT_SOM5 DPAR = Dental Paraxial Rebuilt Tomogram
CT_SOM5 DFLM = Dental Filming Image
CT_SOM5 DYB = Dynamic Evaluation Averaged Baseline Image
CT_SOM5 DYF = Dynamic Evaluation Fused Multislice Image
CT_SOM5 PEVI = Pulmo Evaluation Image
CT_SOM5 OEVA = Osteo Evaluated Tomogram
CT_SOM5 MIP = Maximum Intensity Projection image created by a CT application
CT_SOM5 MPR = Multi Planar Reconstruction image created by a CT application

CT_SOM5 REP = Lung Care Report Image
CT_SOM7 VPCT = Volume Perfusion CT
CT_SOM7 FLU= Fluoroscopic

❑ converted images

CT_SOM4 NONE = converted SOMARIS image
CT_SOM4 CONV = converted SOMARIS Convolution Kernel file
CT_SOM4 DART = converted SOMARIS Dental Artificial image
CT_SOM4 DEVA = converted SOMARIS Dental Evaluation image
CT_SOM4 DGRA = converted SOMARIS Dental Graphics image
CT_SOM4 DMEA = converted SOMARIS Dynamic Measurement image
CT_SOM4 DPAN = converted SOMARIS Dental Panorama image
CT_SOM4 DPAR = converted SOMARIS Dental Paraxial image
CT_SOM4 EBT = converted SOMARIS Evolution image
CT_SOM4 HIS = converted SOMARIS Histogram Graphics image
CT_SOM4 HISC = converted SOMARIS Histogram Graphics image
CT_SOM4 MUL = converted SOMARIS Multiscan image
CT_SOM4 OEVA = converted SOMARIS Osteo Evaluation image
CT_SOM4 OTOM = converted SOMARIS Osteo Tomogram image
CT_SOM4 OTOP = converted SOMARIS Osteo Topogram image
CT_SOM4 PLOT = converted SOMARIS Plot image
CT_SOM4 QUAL = converted SOMARIS Quality image
CT_SOM4 R2D = converted SOMARIS 2D Rebuild image
CT_SOM4 R3D = converted SOMARIS 3D Rebuild image
CT_SOM4 R3DE = converted SOMARIS 3D Rebuild image
CT_SOM4 RMAX = converted SOMARIS Maximum Intensity Projection image

CT_SOM4 RMIN = converted SOMARIS Minimum Intensity Projection image
CT_SOM4 ROT = converted SOMARIS Rotation Mode image
CT_SOM4 RRAD = converted SOMARIS Radiographic Projection image
CT_SOM4 RVIT = converted SOMARIS Vessel Image Tool image
CT_SOM4 RVRT = converted SOMARIS Volumetric Rendering image
CT_SOM4 SAVE = converted SOMARIS Evolution Screen Save image
CT_SOM4 SCAN = converted SOMARIS Standard Mode image
CT_SOM4 SEQ = converted SOMARIS Sequence Mode image
CT_SOM4 SER = converted SOMARIS Serial Mode image
CT_SOM4 SIN = converted SOMARIS Sinogram image
CT_SOM4 SINC = converted SOMARIS Sinogram image
CT_SOM4 SPI = converted SOMARIS Spiral Mode image
CT_SOM4 STA = converted SOMARIS Static Mode image
CT_SOM4 TAB = converted SOMARIS Correction Table image
CT_SOM4 TOP = converted SOMARIS Topogram image
CT_SOM4 GTOP = converted SOMARIS Topo Graphics image
CT_SOM4 PEVG = converted SOMARIS Pulmo Evaluation image
CT_SOM4 PEVI = converted SOMARIS Pulmo Evaluation image
CT_SOM4 PUL = converted SOMARIS Pulmo Respiration curve
CT_SOM4 PROT = converted SOMARIS Protocol image
CT_SOM4 TEXT = converted SOMARIS Text image
CT_SOM4 ICD = converted SOMARIS Interventional Cine image
SHS DENT = converted MagicView Dental Tomogram image

SHS DPAN = converted MagicView Dental Panorama image
SHS DPAR = converted MagicView Dental Paraxial image
SHS 3D_CURVED = converted MagicView image
SHS 3D_MIP = converted MagicView Maximum Intensity Projection image
SHS 3D_MPR = converted MagicView Multi Planar Reconstruction image
SHS 3D_SSD = converted MagicView Shaded Surface Display image
SHS 3D_VRT = converted MagicView Volumetric Rendering image

❏ **Value 5** is specific for the Somaris/7 or Somaris/5 based SOMATOM products. In special cases (3D postprocessing) values mentioned for a lower index may appear for value 5 or higher. This will refer to 3D postprocessing base image types.
The following terms are defined:
ADD = Additional Scan
ALP = Arterial Liver Perfusion
AVG= Average
BF= NeuroVPCT Blood Flow
BFI = NeuroVPCT Blood Flow - IncGamma
BV= NeuroVPCT Blood Volume
BVP = NeuroVPCT Blood Volume - Patlak
CBF = NeuroVPCT Blood Flow
CBFA = NeuroVPCT Blood Flow - Alternate
CBFI = NeuroVPCT Blood Flow - IncGamma
CBV= NeuroVPCT Blood Volume
CBVA = NeuroVPCT Blood Volume - Alternate
CBVP = NeuroVPCT Blood Volume - Patlak
CSQP = Patlak ChiSquare
CTL = Control Scan
HPI = Hepatic Perfusion Index
FINISHED = Lung Care Report Image (finished)
IN_WORK = Lung Care Report Image (not finished)
MIP = Maximum Intensity Projection
MRTD = Multiscan Real Time Display Image
MTTA = Mean Transit Time - Alternate

OTOM = Osteo Scanned Tomogram
OTOP = Osteo Scanned Topogram
PBF = Perfusion Blood Flow Image
PBV = Perfusion Blood Volume Image
PKET = Peak Enhancement Parameter Image
PMBA = Permeability - Alternate
PMBP = Permeability
PMON = Premonitoring Scan
PEAK = NeuroVPCT Peak Enhancement
PVP = Portal Venous Liver Perfusion
RSDP = Patlak Residual
RSQP = Patlak RSquare
RT3D CONFIG = InSpace Configuration Image
STD = Standard image of corresponding Type 4
TTDA = Time to Drain - Alternate
TTP = Time to Peak Parameter Image
TTS = Time to Start Parameter Image
TTSA = NeuroVPCT Time to Start Parameter Image

- **Value 6** is specific for the Somaris/7 based SOMATOM products. For Dual Tube scans there is a more detailed distinction here.
  The following terms are defined:
  DNRG = Dual Energy
  SNRG = Single Energy
- **Value 7** is specific for the Somaris/7 based SOMATOM products. For Dual Energy scans there is a more detailed distinction here.
  The following terms are defined:
  DET_A = Only data of detector A used
  DET_B = Only data of detector B used
  DET_AB = Data is derived from detector A and detector B

Body Part Examined

The Body Part Examined (0018,0015) attribute provides a textual description of the part of the body examined. The Somaris/7 based SOMATOM products extend the Defined Terms:

- **SPINE** = Summary term used instead of the Defined Terms CSPINE, TSPINE, LSPINE, and SSPINE
- **SPECIAL** = Image was acquired with acquisition modes that are not mapped to a certain part of the body
- **SERVICE** = Image was acquired for maintenance purpose
- **UNKNOWN** = No information about the body part available

See → page A.4–39, *Somaris/7 Attribute Interpretation* for a mapping of the organ characteristics used for examination to the Body Part Examined terms.

In addition, the user interface permits the definition of new terms by the user. So in fact any syntactically correct value may be present as a value of this attribute. It is recommended, though, to use the DICOM defined terms when appropriate.

RGB color images

The Somaris/7 DICOM application extends the CT Image IOD by the use of 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, i.e. 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). Thus window related attributes must not be used to interpret the pixel values as scaled HU. The values used by Somaris/7 are:

☐ window center (attribute 0028, 1050) = 128
☐ window width (attribute 0028,1051) = 256
☐ rescale intercept (attribute 0028, 1050) = 0
☐ rescale slope (attribute 0028,1051) = 1

The following types of images may use this format:

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
Averaged Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 AVE	none	AVE
Parameter Image (Patlak Blood Volume)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKBV	PAR
Parameter Image (Peak enhancement)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKET	PAR
Parameter Image (Perfusion Blood Flow)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PBF	PAR
Parameter Image (Perfusion Blood Volume)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PBV	PAR
Parameter Image (Permeability)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PMB	PAR

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
Parameter Image (Time to Peak)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	TTP	PAR
Parameter Image (Time to Start)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	TTS	PAR
Parameter Image (Patlak Residual)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKER	PAR
Parameter Image (Patlak RSquare)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKR2	PAR
Parameter Image (Arterial Liver Perfusion)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	ALP	PAR
Parameter Image (Portal Venous Liver Perfusion)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PVP	PAR

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
Parameter Image (Hepatic Perfusion Index)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	HPI	PAR
PerfusionCT Image (Maximum Intensity Projection)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	MIP	VPCT
PerfusionCT Image (Average)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	AVG	VPCT
PerfusionCT Image (NeuroVPCT Blood Flow)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	CBF	VPCT
PerfusionCT Image (NeuroVPCT Blood Flow - IncGamma)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	CBFI	VPCT

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
PerfusionCT Image (NeuroVPCT Blood Flow - Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	CBFA	VPCT
PerfusionCT Image (BodyVPCT Blood Flow)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	BF	VPCT
PerfusionCT Image (BodyVPCT Blood Flow - IncGamma)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	BFI	VPCT
PerfusionCT Image (BodyVPCT Blood Flow - Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	BFA	VPCT
PerfusionCT Image (Peak enhancement)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	PEAK	VPCT

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
PerfusionCT Image (NeuroVPCT Blood Volume)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	CBV	VPCT
PerfusionCT Image (NeuroVPCT Blood Volume - Patlak)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	CBVP	VPCT
PerfusionCT Image (NeuroVPCT Blood Volume - Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	CBVA	VPCT
PerfusionCT Image (BodyVPCT Blood Volume)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	BV	VPCT
PerfusionCT Image (BodyVPCT Blood Volume - Patlak)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	BVP	VPCT

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
PerfusionCT Image (BodyVPCT Blood Volume - Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	BVA	VPCT
PerfusionCT Image (Time to Start)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	TTS	VPCT
PerfusionCT Image (Time to Start - Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	TTSA	VPCT
PerfusionCT Image (Time to Peak)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	TTP	VPCT
PerfusionCT Image (Time To Drain Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	TTDA	VPCT

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
PerfusionCT Image (Mean Transit Time - Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	MTTA	VPCT
PerfusionCT Image (Permeability)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	PMBP	VPCT
PerfusionCT Image (Permeability - Alternate)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	PMBA	VPCT
PerfusionCT Image (Patlak RSquare)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	RSQP	VPCT
PerfusionCT Image (Patlak ChiSquare)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	CSQP	VPCT
PerfusionCT Image (Patlak Residual)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	RSDP	VPCT

Somaris/7 Image Type (0008,0008) for objects <u>created</u> by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
PerfusionCT Image (Arterial Liver Perfusion)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	ALP	VPCT
PerfusionCT Image (Portal Venous Liver Perfusion)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	PVP	VPCT
PerfusionCT Image (Hepatic Perfusion Index)	CT	DERIVED	SECONDARY	AXIAL, SAGITTAL, CORONAL	CT_SOM7 VPCT	HPI	VPCT
Screenshot Image	SC	DERIVED	SECONDARY	OTHER	VPCT	none	VPCT
Max Intensity Projection Image (Perfusion)	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MIP		MIP
LungCARE send-to-Filming images	CT	DERIVED	SECONDARY	OTHER	CSA MIP THIN	LC VALID WINDOW	MIP

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text
LungCARE send-to-Filming images	CT	DERIVED	SECONDARY	OTHER	CSA MPR THICK	LC VALID WINDOW	MPR
LungCARE send-to-Filming images	CT	DERIVED	SECONDARY	OTHER	CSA VRT THIN	LC VALID WINDOW	VRT
LungCARE send-to-Filming images	CT	DERIVED	SECONDARY	OTHER	CSA PRVT	LC VALID WINDOW	PVRT
LungCARE send-to-Filming images	CT	DERIVED	SECONDARY	OTHER	CSA MPR	LC VALID WINDOW	MPR

CT images with Color Lookup Table

Images deriving from the Application Neuro PBV are created as CT Images with the Photometric Interpretation (0028,0004) set to "MONOCHROME2". Additionally there is a Color Lookup Table stored in the Private Header.

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	**IOD**	**0008,0008 Value 1**	**0008,0008 Value 2**	**0008,0008 Value 3**	**0008,0008 Value 4**	**0008,0008 Value 5**	**Somaris/7 Image Text or Lists**
Neuro PBV (Perfused Blood Volume)	CT	DERIVED	SECONDARY	AXIAL	NEUROPBV	none	none
Neuro PBV (Perfusion Weighted Map)	CT	DERIVED	SECONDARY	AXIAL	NEUROPM	none	none

Specializations

Images created by Somaris/7

The following table lists the Somaris/7 image types and the corresponding combinations of the Image Type Attribute values:

Somaris/7 Image Type (0008,0008) for objects <u>created</u> by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
3D MPR	SC	DERIVED	SECONDARY	LOCALIZER	CSA MPR	none	MPR
3D MPR THICK	SC	DERIVED	SECONDARY	LOCALIZER	CSA MPR THICK	none	MPR THICK
3D MIP	SC	DERIVED	SECONDARY	LOCALIZER	CSA MIP	none	MIP
3D MIP THIN	SC	DERIVED	SECONDARY	LOCALIZER	CSA MIP THIN	none	MIP THIN
Averaged Image [Average, DynEva, Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 AVE	none	AVE
Interventional Cine Display Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 ICD	none	ICD
Monitoring Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 MON	none	MON
Premonitoring Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 MON	PMON	MON

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
Multiscan Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 MUL	none	MUL
Parameter Image (Arterial Liver Perfusion) [BodyPerfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	ALP	PAR
Parameter Image (Hepatic Perfusion Index) [BodyPerfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	HPI	PAR
Parameter Image (Portal Venous Liver Perfusion) [BodyPerfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PVP	PAR
Protocol Image, Time Density Curve Image [BodyPerfusion][a]	SC	DERIVED	SECONDARY	OTHER	none	none	AC

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
Parameter Image (Patlak Blood Volume) [Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKBV	PAR
Parameter Image (Patlak Residual) [Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKER	PAR
Parameter Image (Patlak RSquare) [Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKR2	PAR
Parameter Image (Peak enhancement) [DynEva, Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PKET	PAR
Parameter Image (Perfusion Blood Flow) [Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PBF	PAR

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
Parameter Image (Perfusion Blood Volume) [Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PBV	PAR
Parameter Image (Permeability) [Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	PMB	PAR
Parameter Image (Time to Peak) [DynEva, Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	TTP	PAR
Parameter Image (Time to Start) [Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PAR	TTS	PAR
Protocol Image	SC	DERIVED	SECONDARY	OTHER	CT_SOM5 PROT	none	PROT (List only)
Report Image (not finished)	SC	DERIVED	SECONDARY	OTHER	CT_SOM5 REP	IN_WORK	REP
Report Image (finished)	SC	DERIVED	SECONDARY	OTHER	CT_SOM5 REP	FINISHED	REP

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
ROT Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 ROT	none	ROT
Real Time Display Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 RTD	none	RTD
Real Time Display Image (Dual Tube), Som5 compatible	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 RTD DUAL	STD	RTD DUAL
Real Time Display Image (Cardio)	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM7 RTD DUAL	STD	RTD DUAL
Multiscan Real Time Display Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 RTD	MRTD	RTD
Sequence Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SEQ	none	SEQ
Sequence Image (Dual Tube)	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SEQ DUAL	STD	SEQ DUAL
Additional Scan Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SEQ	ADD	SEQ

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
Control Scan Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SEQ	CTL	SEQ
Spiral Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SPI	none	SPI
Spiral Image (Dual Tube)	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SPI DUAL	STD	SPI DUAL
Spiral Image (Cardio)	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM7 SPI DUAL	STD	SPI DUAL
Spiral Oblique Image	CT	DERIVED	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SPO	none	SPO
Static Image	CT	ORIGINAL	PRIMARY	OTHER	CT_SOM5 STA	none	STA
Subtracted Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 SUB	none	SUB
Topogram	CT	ORIGINAL	PRIMARY	LOCALIZER	CT_SOM5 TOP	none	TOP
Osteo Scanned Tomogram	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 SEQ	OTOM	SEQ

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
Osteo Scanned Topogram	CT	ORIGINAL	PRIMARY	LOCALIZER	CT_SOM5 TOP	OTOP	TOP
Osteo Evaluated Tomogram	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 OEVA	none	OEVA
Pulmo Evaluated Tomogram	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PEVI	none	PEVI
Calcium Scoring Table [Calcium Scoring]	SC	DERIVED	SECONDARY	OTHER	CT_SOM5 TAB	none	TAB
Dental Filming Image	CT	DERIVED	SECONDARY	OTHER	CT_SOM5 DFLM	none	DFLM
Dental Panorama Rebuild Tomogram	CT	DERIVED	SECONDARY	OTHER	CT_SOM5 DPAN	none	DPAN
Dental Paraxial Rebuild Tomogram	CT	DERIVED	SECONDARY	OTHER	CT_SOM5 DPAR	none	DPAR

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7							
Image Type Description [known creating applications]	**IOD**	**0008,0008 Value 1**	**0008,0008 Value 2**	**0008,0008 Value 3**	**0008,0008 Value 4**	**0008,0008 Value 5**	**Somaris/7 Image Text or Lists**
Dental/ Volume Maximum Intensity Projection Image [Dental, Volume, DynEva, Perfusion]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MIP	none	MIP
Dental Panorama Reference Image [Dental, Volume]	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MPR	none	MPR
Dental Paraxial Reference Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MPR	none	MPR
Dental Reference Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MPR	none	MPR
Dynamic Evaluation Averaged Baseline	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 DYB	none	DYB

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
Dynamic Evaluation Fused Multislice	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 DYF	none	DYF
Volume reformatted images (sagittal and coronal)	CT	DERIVED	SECONDARY	OTHER	CT_SOM5 MPR	none	MPR
Various result images [CalciumScoring, Colon]	CT	DERIVED	SECONDARY	AXIAL	CSA MPR	none	MPR
Various result images	CT	DERIVED	SECONDARY	AXIAL	CSA MPR THICK	none	MPR
Various result images	CT	DERIVED	SECONDARY	AXIAL	CSA MIP	none	MIP
Various result images [CalciumScoring]	CT	DERIVED	SECONDARY	AXIAL	CSA MIP THIN	none	MIP
Various result images [Colon]	SC	DERIVED	SECONDARY	OTHER	CSA PSSD	none	PSSD
Various result images	CT	DERIVED	SECONDARY	AXIAL	CSA VRT	none	VRT
Various result images [Colon]	SC	DERIVED	SECONDARY	OTHER	CSA VRT	none	VRT

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
InSpace bookmark [InSpace]	SC	DERIVED	SECONDARY	OTHER	CSA BOOKMARK	RT3D CONFIG	BOOK
InSpace result images [InSpace]	SC	DERIVED	SECONDARY	OTHER	CSA 3DPRO-JECTION	none	3DPR
LungCARE save images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	MIP	LC VALID WINDOW	MIP
LungCARE save images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	MPR	LC VALID WINDOW	MPR
LungCARE save images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	VRT	LC VALID WINDOW	VRT
LungCARE save images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	PVRT	LC VALID WINDOW	PVRT
LungCARE save images [LungCARE]	CT	DERIVED	SECONDARY	OTHER	MPR	LC VALID WINDOW	MPR
LungCARE save images [LungCARE]	CT	DERIVED	SECONDARY	OTHER	CT_SOM5 SPI	LC VALID WINDOW	SPI
LungCARE report images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	MIP	LC VALID WINDOW	none

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
LungCARE report images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	MPR	LC VALID WINDOW	none
LungCARE report images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	VRT	LC VALID WINDOW	none
LungCARE report images [LungCARE]	SC	DERIVED	SECONDARY	OTHER	PVRT	LC VALID WINDOW	none
Various Graphics [DynEva, Osteo, Pulmo, Volume, Perfusion, Argus]	SC	DERIVED	SECONDARY	OTHER	CSA BLACK IMAGE	none	none
Dual Energy Mixed Series [Dual Energy]	SC	DERIVED	SECONDARY	AXIAL	CT_SOM5 SPI DUAL	STD	none

a. More detailed attribute information will be provided in a future version.

Note

Some applications will create Structured Reports. However, when running in specific (service configured) settings outside of the system they will appear as a SC image, labelled as Type 3 "OTHER" and Type 4 "CSA REPORT". This private extension is not published in detail here because the intended use is real DICOM SR.

Structured Reports created by Somaris/7

The following table lists the Somaris/7 image types and the corresponding combinations of the Image Type Attribute values.

Somaris/7 Image Type (0008,0008) for objects created by Somaris/7

Image Type Description [known creating applications]	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/7 Image Text or Lists
LungCARE SR reports [LungCARE, Calcium Scoring, Circulation]	SR	ORIGINAL	PRIMARY	OTHER	CSA REPORT	none	none

LungCARE, Calcium Scoring and Circulation create Comprehensive Structured Reports.

The following is valid for Calcium Scoring created Structured Reports:
CaScoring creates structured reports generally following the templates defined in DICOM supplement 97 “CT/MR Cardiovascular Analysis Report” (Version: 0.11; Working Draft). Some changes of these templates that could not be considered may occur until document is released as final version.

The following is valid for Circulation created Structured Reports:
Circulation creates structured reports generally following the DICOM template TID3900.

Somaris/7 Attribute Interpretation

For an overview of selected attribute filling for different Image Types please refer to the Annex.

The table below explains how common attributes of created and uncompressed ORIGINAL and AXIAL images are set by Somaris/7 image reconstruction. This table does not intend to be a substitute for DICOM 3.0 attribute definitions. However, in addition to these it will provide an impression of which attributes are in common use - and how they are related to Somaris/7 examination:

Tag	Name	Explanation
0002,0012	Implementation Class UID	Value: 1.3.12.2.1107.5.1.4
0002,0013	Implementation Version Name	Value: SIEMENS_S7VA20A
0008,0005	Specific Character Set	
0008,0008	Image Type	see → page A.4–26, Images created by Somaris/7
0008,0016	SOP Class UID	Value: 1.2.840.10008.5.1.4.1.1.2
0008,0018	SOP Instance UID	created
0008,0020	Study Date	For existing studies their date and time entries are copied into the corresponding entries in a new image's header. If a new study is created the date and time entries from the first series of this new study will be used.
0008,0030	Study Time	

Tag	Name	Explanation
0008,0021 0008,0031	Series Date Series Time	For existing series their date and time entries are copied into the corresponding entries in a new image's header. If a new series is created the current real-world date and time will be used.
0008,0022 0008,0032	Acquisition Date Acquisition Time	Acquisition Date and Time is defined as the real-world beginning of the accumulation of data which contribute to a particular image. Due to the multi-slice technology several images may have the same Acquisition Date and Time.
0008,0023 0008,0033	Image (Content) Date Image (Content) Time	For all images which result from a reconstruction of acquired data, the time stamp is the same as Acquisition Date and Time. This is true for images that were reconstructed immediately after data acquisition as well as for images that were reconstructed at any time later. For all other images created by any other means the time stamp is derived from a point in time during the creation process of these images.
0008,0050	Accession Number	Input entered from MWL or during patient registration. May be null-length. NOTE: When Study Split is used, the value corresponding to the Requested Procedure Description selected in Exam UI will be sent
0008,0060	Modality	Value: CT
0008,0070	Manufacturer	Value: SIEMENS

Tag	Name	Explanation
0008,0080	Institution Name	Hospital name read from configuration data or user input entered during patient registration or examination setup
0008,0081	Institution Address	Hospital address read from configuration data. Default format is 4 lines containing Street, City, District and Country.
0008,0090	Referring Physician's Name	Input from MWL or entered during patient registration or examination setup. May be null-length.
0008,1010	Station Name	Name of the computer the examination is controlled with
0008,1030	Study Description	Is derived from information entered during patient registration or examination setup. Concatenated from Body Region and selected Scan Protocol name, separated by a "^" NOTE: When Study Split is used, the Requested Procedure Description selected in Exam UI will be sent
0008,1050	Performing Physician’s Name	Input entered from MWL or during patient registration.
0008,1070	Operator’s Name	According to user input
0008,1080	Admitting Diagnoses Description	Input entered from MWL or during patient registration.
0008,103E	Series Description	According to user input (system proposes <Range Name> <Slice Thickness> <Kernel>)
0008,1090	Manufacturer's Model Name	The Siemens product name

Tag	Name	Explanation
0008,1140	Referenced Image Sequence	
>0008,1150	Referenced SOP Class UID	SOP Class UID of Topogram used for planning
>0008,1155	Referenced SOP Instance UID	SOP Instance UID of Topogram used for planning
0008,2112	Source Image Sequence	
>0008,1150	Referenced SOP Class UID	SOP Class UID of Rawdata used for reconstruction
>0008,1155	Referenced SOP Instance UID	SOP Instance UID of Rawdata used for reconstruction
0008,2111	Derivation Description	Lossy Image Compression will be set to 01 for Extended Field of View because of low image quality. Derivation Description: "Reconstruction field larger than scan field"
0009,00xx	Private Creator	Value: SIEMENS CT VA1 DUMMY
0010,0010	Patient's Name	Input from MWL or entered during patient registration or examination setup.
0010,0020	Patient ID	Input from MWL or entered or generated during patient registration or examination setup.
0010,0030	Patient's Birth Date	Input from MWL or entered during patient registration or examination setup. May be calculated from age.
0010,0040	Patient's Sex	Input from MWL or entered during patient registration or examination setup.

<table>
<tr><th>Tag</th><th>Name</th><th>Explanation</th></tr>
<tr><td>0010,1010</td><td>Patient's Age</td><td>Input from MWL or entered during patient registration or examination setup. May be calculated from Patient’s Birth Date</td></tr>
<tr><td>0018,0010</td><td>Contrast/Bolus Agent</td><td>If present:
The attribute is filled with the value entered in the contrast card. If nothing was entered the attribute is filled with the fixed term "APPLIED".</td></tr>
<tr><td>0018,0015</td><td>Body Part Examined</td><td>The Body Part Examined is derived from the organ characteristic of the scan or directly entered by the operator, which overrides this default.
The organ characteristic parameter is contained in the scan protocol selected for examination during patient registration or examination setup and may vary for different scans within one protocol (use System/Run/List Scan Protocols column "OrgChar" for a list of values for specific scan protocols).
<table>
<tr><th>Organ Characteristic</th><th>Body Part Examined</th></tr>
<tr><td>Head</td><td>HEAD</td></tr>
<tr><td>Neck</td><td>NECK</td></tr>
<tr><td>Shoulder</td><td>SHOULDER</td></tr>
<tr><td>Thorax</td><td>CHEST</td></tr>
<tr><td>Abdomen</td><td>ABDOMEN</td></tr>
<tr><td>Spine</td><td>SPINE</td></tr>
<tr><td>Pelvis</td><td>PELVIS</td></tr>
<tr><td>Extremities</td><td>EXTREMITY</td></tr>
<tr><td>Cardio</td><td>HEART</td></tr>
<tr><td>Service</td><td>SERVICE</td></tr>
<tr><td>n. a.</td><td>UNKNOWN</td></tr>
</table>
</td></tr>
</table>

Tag	Name	Explanation
0018,0022	Scan Options	This field is used for storing cardiac information.
0018,0050	Slice Thickness	Resulting slice thickness. Not necessarily equal to collimated slice.
0018,0060	KVP	Voltage selected for scan.
0018,0090	Data Collection Diameter	
0018,1000	Device Serial Number	Serial number of the CT system's gantry.
0018,1020	Software Version(s)	Software Version of Somaris/7. Only one value is used.
0018,1030	Protocol Name	Name of Scan Protocol selected during patient registration or examination setup
0018,1100	Reconstruction Diameter	Field of View selected for reconstruction
0018,1110	Distance Source to Detector	
0018,1111	Distance Source to Patient	
0018,1120	Gantry/Detector Tilt	
0018,1130	Table Height	Table height as entered for scan
0018,1140	Rotation Direction	
0018,1150	Exposure Time	The exposure time for the respective image. For spiral scan or multiscan this corresponds to the rotation time.
0018,1151	X-ray Tube Current	Tube current used for scanning

Tag	Name	Explanation
0018,1152	Exposure	(Effective) mAs. For spiral images the product of exposure time and x-ray tube current is corrected with Table Feed per Rotation. Expressed in mAs.
0018,1160	Filter Type	0: No Filter, 1: Teflon Filter
0018,1170	Generator Power	
0018,1190	Focal Spots	Size of the focal spot actually used to generate x-ray radiation for a particular image.This is a single value expressed in mm.
0018,1200	Date of Last Calibration	Date of last Base Calibration
0018,1201	Time of Last Calibration	Time of last Base Calibration
0018,1210	Convolution Kernel	4 character code of convolution kernel
0018,5100	Patient Position	As entered for scan
0018,9306	Single Collimation Width	As entered for scan
0018,9307	Total Collimation Width	As entered for scan
0018,9309	Table Speed	The distance in mm that the table moves in one second during the gathering of data that resulted in this image.
0018,9310	Table Feed per Rotation	As entered for scan
0018,9311	CT Pitch Factor	As entered for scan
0018,9323	Exposure Modulation Type	As entered for scan

Tag	Name	Explanation
0018,9324	Estimated Dose Saving	calculated by the system
0018,9345	CTDIvol	calculated by the system
0019,00xx	Private Creator	Value: SIEMENS CT VA0 COAD
0019,xxB0	Feed per Rotation	Movement of table during one rotation in mm
0020,000D	Study Instance UID	From MWL or created NOTE: When Study Split is used, the value corresponding to the Requested Procedure Description selected in Exam UI will be sent
0020,000E	Series Instance UID	From MWL or created
0020,0010	Study ID	From MWL or created NOTE: When Study Split is used, the value corresponding to the Requested Procedure Description selected in Exam UI will be sent
0020,0011	Series Number	created
0020,0012	Acquisition Number	Scan number within this examination.
0020,0013	Instance Number	created; direction within range selectable by user
0020,0032	Image Position (Patient)	The x, y, and z coordinates of the center of the first pixel, in mm.
0020,0037	Image Orientation (Patient)	
0020,0052	Frame of Reference UID	created
0020,1040	Position Reference Indicator	null-length

Tag	Name	Explanation
0020,1041	Slice Location	Topogram: Slice Location is defined as the relative table position of the very beginning of the Topogram image expressed in mm. Tomogram: Slice Location is defined as the relative position of the intersection of the image's slice with the z-axis expressed in mm. This positions is relative to the current reference point and corresponds to the table position.
0020,4000	Image Comments	According to user input. 2 lines supported.
0021,00xx	Private Creator	Value: SIEMENS MED
0021,xx11	Target	Center x/y as entered for reconstruction
0028,0002	Samples per Pixel	Value: 1
0028,0004	Photometric Interpretation	Value: MONOCHROME2
0028,0010	Rows	
0028,0011	Columns	
0028,0030	Pixel Spacing	
0028,0100	Bits Allocated	Value: 16
0028,0101	Bits Stored	Value: 12
0028,0102	High Bit	Value: 11
0028,0103	Pixel Representation	Value: 0
0028,0106	Smallest Image Pixel Value	Calculated by examination
0028,0107	Largest Image Pixel Value	Calculated by examination

Tag	Name	Explanation
0028,1050	Window Center	Last windowing center saved. First window followed by second window.
0028,1051	Window Width	Last windowing width saved. First window followed by second window.
0028,1052	Rescale Intercept	Value -1024 for images without extended CT scale
0028,1053	Rescale Slope	Value 1 for images without extended CT scale
0028,1055	Window Center & Width Explanation	Value: "WINDOW1", "WINDOW2"
0028,2110	Lossy Image Compression	Lossy Image Compression will be set to 01 for Extended Field of View because of low image quality. Derivation Description: "Reconstruction field larger than scan field"
0029,xxxx	(private data)	see → page A.4–52, Privatizations
0029,xx40	Application Header Sequence	see → page A.4–52, Privatizations
>0029,00xx	Private Creator	"SIEMENS MEDCOM HEADER"
>0029,xx41	Application Header Type	"SOM 5 TPOS"
>0029,xx42	Application Header ID	"SOM 5 NULLPOSITION"
>0029,xx43	Application Header Version	"VB10A 20030626"
>0029,xx44	Application Header Info	Table Null Position coded as a null terminated character buffer

Tag	Name	Explanation
0032,1060	Requested Procedure Description	Input entered during patient registration or examination setup. NOTE: When Study Split is used, the value corresponding to the Requested Procedure Description selected in Exam UI will be sent
7FE0,0010	Pixel Data	

OOG, Overlays, High Bits

Graphics in Somaris/7 images are stored as Object Oriented Graphics (OOG) in private attributes (→ page A.4–63, *MEDCOM OOG Module*). Non *syngo* based systems are not expected to interpret this information.

In order to allow display access to graphics information for DICOM based systems private OOG information is converted on export into DICOM Overlay information stored in group 6000. This is the recommended way for a DICOM based system to access overlay graphics information.

The following attibutes are generated:

Overlay Rows (6000,0010)

Overlay Columns (6000,0011)

Number of Frames in Overlay (6000,0015)

Overlay Description (6000,0022) =
"Siemens MedCom Object Graphics"

Overlay Type (6000,0040) = "G"

Origin (6000,0050) = 1, 1

Image Frame Origin (6000,0051)

Overlay Bits Allocated (6000,0100)

Bit Position (6000,0102)

Overlay Data (6000,3000)

However, DICOM Overlay information stored in group 6000 is not supported by all systems that might be used to store Somaris/7 images. These systems may not be able to display Somaris/7 generated overlays. For a special group of these systems there is another way to provide graphical overlay information. A remote node can be configured to have overlay graphics converted into unused pixel data above High Bit (0028,0102) for images that fulfil the following condition:

❏ bits allocated (attribute 0028, 0100) = 16

❏ bits stored (attribute 0028,0101) = 12

❏ high bit (attribute 0028,0102) = 11

Some systems are known to support this coding; they are able to display this information with the images. Please note, however, that the proper and recommended way to store overlays with DICOM is the use of group 6000.

Privatizations

Private Elements for Storage SOP Classes

The following private attributes are defined for all Siemens *syngo* based applicarions:

Registry of DICOM Data Elements

Tag	Private Owner Code	Name	VR	VM
(0029,xx08)	SIEMENS CSA HEADER	CSA Image Header Type	CS	1
(0029,xx09)	SIEMENS CSA HEADER	CSA Image Header Version	LO	1
(0029,xx10)	SIEMENS CSA HEADER	CSA Image Header Info	OB	1
(0029,xx18)	SIEMENS CSA HEADER	CSA Series Header Type	CS	1
(0029,xx19)	SIEMENS CSA HEADER	CSA Series Header Version	LO	1
(0029,xx20)	SIEMENS CSA HEADER	CSA Series Header Info	OB	1
(0029,xx08)	SIEMENS CSA NON-IMAGE	CSA Data Type	CS	1
(0029,xx09)	SIEMENS CSA NON-IMAGE	CSA Data Version	LO	1
(0029,xx10)	SIEMENS CSA NON-IMAGE	CSA Data Info	OB	1
(0029,xx08)	SIEMENS CSA REPORT	*syngo* Report Type	CS	1
(0029,xx09)	SIEMENS CSA REPORT	*syngo* Report	LO	1
(0029,xx15)	SIEMENS CSA REPORT	SR Variant	US	1
(0029,xx17)	SIEMENS CSA REPORT	SC SOP Instance UID	UI	1
(0029,xx10)	SIEMENS CSA ENVELOPE	*syngo* Report Data	OB	1
(0029,xx11)	SIEMENS CSA ENVELOPE	*syngo* Report Presentation	OB	1

Tag	Private Owner Code	Name	VR	VM
(0029,xx08)	SIEMENS MEDCOM HEADER	MedCom Header Type	CS	1
(0029,xx09)	SIEMENS MEDCOM HEADER	MedCom Header Version	LO	1
(0029,xx10)	SIEMENS MEDCOM HEADER	MedCom Header Info	OB	1
(0029,xx20)	SIEMENS MEDCOM HEADER	MedCom History Information	OB	1
(0029,xx31)	SIEMENS MEDCOM HEADER	PMTF Information 1	LO	1
(0029,xx32)	SIEMENS MEDCOM HEADER	PMTF Information 2	UL	1
(0029,xx33)	SIEMENS MEDCOM HEADER	PMTF Information 3	UL	1
(0029,xx34)	SIEMENS MEDCOM HEADER	PMTF Information 4	CS	1
(0029,xx35)	SIEMENS MEDCOM HEADER	PMTF Information 5	UL	1
(0029,xx40)	SIEMENS MEDCOM HEADER	Application Header Sequence	SQ	1
(0029,xx41)	SIEMENS MEDCOM HEADER	Application Header Type	CS	1
(0029,xx42)	SIEMENS MEDCOM HEADER	Application Header ID	LO	1
(0029,xx43)	SIEMENS MEDCOM HEADER	Application Header Version	LO	1
(0029,xx44)	SIEMENS MEDCOM HEADER	Application Header Info	OB	1

Tag	Private Owner Code	Name	VR	VM
(0029,xx50)	SIEMENS MEDCOM HEADER	Workflow Control Flags	LO	8
(0029,xx51)	SIEMENS MEDCOM HEADER	Archive Management Flag Keep Online	CS	1
(0029,xx52)	SIEMENS MEDCOM HEAD	Archive Management Flag Do Not Archive	CS	1
(0029,xx53)	SIEMENS MEDCOM HEADER	Image Location Status	CS	1
(0029,xx54)	SIEMENS MEDCOM HEADER	Estimated Retrieve Time	DS	1
(0029,xx55)	SIEMENS MEDCOM HEADER	Data Size of Retrieved Images	DS	1
(0029,xx70)	SIEMENS MEDCOM HEADER	Siemens Link Sequence	SQ	1
(0029,xx71)	SIEMENS MEDCOM HEADER	Referenced Tag	AT	1
(0029,xx72)	SIEMENS MEDCOM HEADER	Referenced Tag Type	CS	1

Tag	Private Owner Code	Name	VR	VM
(0029,xx73)	SIEMENS MEDCOM HEADER	Referenced Value Length	UL	1
(0029,xx74)	SIEMENS MEDCOM HEADER	Referenced Object Device Type	CS	1
(0029,xx75)	SIEMENS MEDCOM HEADER	Referenced Object Device Location	OB	1
(0029,xx76)	SIEMENS MEDCOM HEADER	Referenced Object ID	OB	1
(0029,xx60)	SIEMENS MEDCOM HEADER2	Series Work Flow Status	LO	1
(0029,xx08)	SIEMENS MEDCOM OOG	MEDCOM OOG Type	CS	1
(0029,xx09)	SIEMENS MEDCOM OOG	MEDCOM OOG Version	LO	1
(0029,xx10)	SIEMENS MEDCOM OOG	MEDCOM OOG Info	OB	1
(7FE1,xx10)	SIEMENS CSA NON-IMAGE	CSA Data	OB	1

The next subsections will explain in which IODs these private data elements are used.

All syngo Supported Image SOP Classes

Extended Image IOD Module Table

IE	Module	Reference	Usage	Note
Patient	Patient	[1] PS 3.3 C.7.1.1	M	
Study	General Study	[1] PS 3.3 C.7.2.1	M	
	Patient Study	[1] PS 3.3 C.7.2.2	U	
Series	General Series	[1] PS 3.3 C.7.3.1	M	
Equipment	General Equipment	[1] PS 3.3 C.7.5.1	U	
Image	General Image	[1] PS 3.3 C.7.6.1	M	
	Image Pixel	[1] PS 3.3 C.7.6.3	M	
	IOD specific modules	[1] PS 3.3 C.8.2.1	M/U	depends on the IOD
	CSA Image Header	→ page A.4–57, CSA Image Header Module	U	
	CSA Series Header	→ page A.4–57, CSA Series Header Module	U	
	MEDCOM Header	→ page A.4–58, MEDCOM Header Module	U	private *syngo* information
	MEDCOM OOG	→ page A.4–63, MEDCOM OOG Module	U	if object graphics is attached to image
	SOP Common	[1] PS 3.3 C.12.1	M	

CSA Image Header Module The table in this section contains private IOD Attributes that describe the CSA Image Header.

Attribute Name	Tag	Private Creator	Type	Notes
CSA Image Header Type	(0029,xx08)	SIEMENS CSA HEADER	1	CSA Image Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4 SOM 5 = Somaris/5 or Somaris/7
CSA Image Header Version	(0029,xx09)	SIEMENS CSA HEADER	3	Version of CSA Image Header Info (0029,xx10) format.
CSA Image Header Info	(0029,xx10)	SIEMENS CSA HEADER	3	Manufacturer Model dependent information.

CSA Series Header Module The table in this section contains private IOD Attributes that describe the CSA Series Header.

Attribute Name	Tag	Private Creator	Type	Notes
CSA Series Header Type	(0029,xx08)	SIEMENS CSA HEADER	1	CSA Series Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4 SOM 5 = Somaris/5 or Somaris/7
CSA Series Header Version	(0029,xx19)	SIEMENS CSA HEADER	3	Version of CSA Series Header Info (0029,xx20) format.
CSA Series Header Info	(0029,xx20)	SIEMENS CSA HEADER	3	Manufacturer Model dependent information.

MEDCOM Header Module The table in this section contains private IOD Attributes that describe MEDCOM Header.

Attribute Name	Tag	Private Creator	Type	Notes
MedCom Header Type	(0029,xx08)	SIEMENS MEDCOM HEADER	1C	MedCom Header identification characteristics. Defined Terms: MEDCOM 1 Required if MedCom Header Info (0029,xx10) present.
MedCom Header Version	(0029,xx09)	SIEMENS MEDCOM HEADER	2C	Version of MedCom Header Info (0029,xx10) format. Required if MEDCOM Header Info (0029,xx10) present.
MedCom Header Info	(0029,xx10)	SIEMENS MEDCOM HEADER	3	Manufacturer model dependent information. The value of the attribute MedCom Header Info (0029,xx10) can be build up in each user defined format.
MedCom History Information	(0029,xx20)	SIEMENS MEDCOM HEADER	3	MedCom defined Patient Registration history information. See → page A.4–63, *MEDCOM History Information*.
PMTF Information 1	(0029,xx31)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 2	(0029,xx32)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 3	(0029,xx33)	SIEMENS MEDCOM HEADER	3	Transformation Information

Attribute Name	Tag	Private Creator	Type	Notes
PMTF Information 4	(0029,xx34)	SIEMENS MEDCOM HEADER	3	Transformation Information
Application Header Sequence	(0029,xx40)	SIEMENS MEDCOM HEADER	3	Sequence of Application Header Items. Zero or more Items shall be included in this sequence. Encoded as a sequence of items.
>Application Header Type	(0029,xx41)	SIEMENS MEDCOM HEADER	1C	Application Header identification characteristics. Required if Sequence is sent.
>Application Header ID	(0029,xx42)	SIEMENS MEDCOM HEADER	3	Identification of an application header.
>Application Header Version	(0029,xx43)	SIEMENS MEDCOM HEADER	3	Version of Application Header Info (0029,xx43) format.
>Application Header Info	(0029,xx44)	SIEMENS MEDCOM HEADER	3	Application dependent information.
Workflow Control Flags	(0029,xx50)	SIEMENS MEDCOM HEADER	3	Eight free definable flags.
Archive Management Flag Keep Online	(0029,xx51)	SIEMENS MEDCOM HEADER	3	Flag to control remote archive management system to keep the image always online (also when already archived). Enumerated Values: 00 = remote control not required, 01 = keep image online.

Attribute Name	Tag	Private Creator	Type	Notes
Archive Management Flag Do Not Archive	(0029,xx52)	SIEMENS MEDCOM HEADER	3	Flag to control remote archive management system not to archive the related image. Enumerated Values: 00 = remote control not required, 01 = don’t archive image.
Image Location Status	(0029,xx53)	SIEMENS MEDCOM HEADER	3	Image location status to control retrieving. Defined Terms: ONLINE = retrieving has to be done as usual, NEARLINE = move request to SCP and delay according to value of Estimated Retrieve Time (0029,xx54), OFFLINE = invoking a retrieve operation initiates an operator request, INVALID = invoking a retrieve operation would always result in an error.
Estimated Retrieve Time	(0029,xx54)	SIEMENS MEDCOM HEADER	3	Estimated retrieve time in seconds. A value less then zero (< 0) indicates location is OFFLINE or INVALID.
Data Size of Retrieved Images	(0029,xx55)	SIEMENS MEDCOM HEADER	3	Data size of images in MByte.
Siemens Link Sequence	(0029,xx70)	SIEMENS MEDCOM HEADER	3	Sequence of Link items. Each item identifies the location of the location of one missing tag. One or more items can be located in this sequence.
Referenced Tag	(0029,xx71)	SIEMENS MEDCOM HEADER	1	The referenced tag. The value of this tag is in the Child Data Object (CDO). Currently it is always Pixel Data (7FE0,0010).

Attribute Name	Tag	Private Creator	Type	Notes
Referenced Tag Type	(0029,xx72)	SIEMENS MEDCOM HEADER	1	The value representation (type) of the missing tag (e.g. OW). Enumerated values are all DICOM defined Value Representations.
Referenced Value Length	(0029,xx73)	SIEMENS MEDCOM HEADER	1	The length of the referenced tag value in bytes.

Referenced Object Device Type	(0029,xx74)	SIEMENS MEDCOM HEADER	1	The Device Type that stores the Child Data Object (CDO) with the referenced tag value. Currently it should be "SHMEM". In future, "SDM", "LOID" or "FILE" are also imaginable.
				Defined Terms are
				SHMEM = Shared Memory
				SDM = Series Data Management
				LOID = Database
				FILE

Referenced Object Device Location	(0029,xx75)	SIEMENS MEDCOM HEADER	2	The Location of the device that stores the Child Data Object (CDO) with the referenced tag value. For the "SHMEM" case, it is the shared memory directory. Can be empty, then the default directory will be taken. In future, for "SDM" this will be the SDM_ID, for FILE it will be the directory name and for "LOID" it will be the database name.

Attribute Name	Tag	Private Creator	Type	Notes
Referenced Object ID	(0029,xx76)	SIEMENS MEDCOM HEADER	1	The ID of the object that contains the Child Data Object (CDO) with the referenced tag value. In case of "SHMEM", it is the shared memory ID. In future, for "SDM" this will be a Sirius OID, for "FILE" the file name, for "DB" the LOID.
Series Work Flow Status	(0029,xx60)	SIEMENS MEDCOM HEADER2	3	*syngo* Patient Browser specific flags used for clinical work: - com = completed - rea = read - ver = verified

MEDCOM History Information

The value of the attribute MEDCOM History Information (0029,xx20) is defined in the following way:

Part	Name	Type	Bytes	Notes
header	Identifier	string	32	always "CSA HISTORY"
	Version	string	32	e.g. "V1.10"
n items	Class Name	string	64	
	Modification String	string	1024	

MEDCOM OOG Module

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

Attribute Name	Tag	Private Creator	Type	Notes
MedCom OOG Type	(0029,xx08)	SIEMENS MEDCOM OOG	1	MEDCOM Object Oriented Graphics (OOG) identification characteristics. Defined Terms: MEDCOM OOG 1
MedCom OOG Version	(0029,xx09)	SIEMENS MEDCOM OOG	3	Version of MEDCOM OOG Info (0029,xx10) format.
MedCom OOG Info	(0029,xx10)	SIEMENS MEDCOM OOG	3	MEDCOM Object Oriented Graphics (OOG) data.

The graphics objects are also stored in one Image overlay plane for compatibility with other products, which don’t support the MedCom OOG module. Any system which does not support this MedCom OOG module has to remove these private attributes when modifying the image overlay plane content.

syngo **Report Data**

The module contains private IOD Attributes that describe *syngo* reports. This module is used when *syngo* report data are added to DICOM SR and DICOM SC objects.

Attribute Name	Tag	Private Creator	Type	Notes
syngo Report Type	(0029,xx08)	SIEMENS CSA REPORT	1	*syngo* report characteristics, e.g. report creating application. Defined Terms: CT_CASCORING CT_CIRCULATION CT_LUNGCARE INSPACE MR_ARGUS This attribute value will be used to identify the corresponding application during generic extension dll management. A restricted character set is used: only A-Z and underscore are supported.
syngo Report Version	(0029,xx09)	SIEMENS CSA REPORT	3	Version of *syngo* Report Data (0029,xx10) format.
syngo Report Data	(0029,xx10)	SIEMENS CSA ENVELOPE	3	Application specific report related data
syngo Report Presentation	(0029,xx11)	SIEMENS CSA ENVELOPE	3	Application specific report related data

Attribute Name	Tag	Private Creator	Type	Notes
SR Variant	(0029,xx15)	SIEMENS CSA REPORT		DICOM SR Variant. Enumerated Values: 0 = Basic Text SR (1.2.840.1008.5.1.4.1.1.88.11) 1 = Enhanced SR (1.2.840.1008.5.1.4.1.1.88.22) 2 = Comprehensive SR (1.2.840.1008.5.1.4.1.1.88.33) 3 = Mammography CAD SR (1.2.840.1008.5.1.4.1.1.88.50) 4 = Key Object Selection Document (1.2.840.1008.5.1.4.1.1.88.59) 5 = Chest CAD SR (1.2.840.1008.5.1.4.1.1.88.65)
SC SOP Instance UID	(0029,xx17)	SIEMENS CSA REPORT	3	DICOM SOP Instance UID of *syngo* based SC image representing the *syngo* report object. This UID will be used to identify the Resulting SC object after SR to SC conversion.

Private Elements for CT Image Storage SOP Class

The following private attributes are defined by Somaris/7.

Registry of DICOM Data Elements

Tag	Private Owner Code	Name	VR	VM	Notes
(0019,xx90)	SIEMENS CT VA0 COAD	Osteo Offset	DS	1	Offset of the water equivalent material of the Siemens Osteo phantom to real water
(0019,xx92)	SIEMENS CT VA0 COAD	Osteo Regression Line Slope	DS	1	Slope of the regression line for the ESP (=European Spine Phantom) standardization
(0019,xx93)	SIEMENS CT VA0 COAD	Osteo Regression Line Intercept	DS	1	Intercept of the regression line for the ESP (= European Spine Phantom) standardization
(0019,xx96)	SIEMENS CT VA0 COAD	Osteo Phantom Number	IS	1	Number of the Siemens Osteo phantom
(0019,xxB0)	SIEMENS CT VA0 COAD	Feed per Rotation	DS	1	Som/4 style Feed per Rotation (Backwards Compatibility)

Tag	Private Owner Code	Name	VR	VM	Notes
(0019,xxBD)	SIEMENS CT VA0 COAD	Pulmo Trigger Level	IS	1	Spirometer trigger level used for the scan, given in percent of VC (= Vital Capacity) of the patient
(0019,xxBE)	SIEMENS CT VA0 COAD	Expiratoric Reserve Volume	DS	1	ERV (= Exspiratoric Reserve Volume) achieved by the patient
(0019,xxBF)	SIEMENS CT VA0 COAD	Vital Capacity	DS	1	VC (= Vital Capacity) achieved by the patient
(0019,xxC0)	SIEMENS CT VA0 COAD	Pulmo Water	DS	1	Density of the water insert of the Siemens Pulmo phantom
(0019,xxC1)	SIEMENS CT VA0 COAD	Pulmo Air	DS	1	Density of the air holes of the Siemens Pulmo phantom
(0019,xxC2)	SIEMENS CT VA0 COAD	Pulmo Date	DA	1	Date of the evaluation of the Siemens Pulmo phantom
(0019,xxC3)	SIEMENS CT VA0 COAD	Pulmo Time	TM	1	Time of the evaluation of the Siemens Pulmo phantom
(0021xx11)	SIEMENS MED	Target	DS	2	Som/4 style Target (Backwards Compatibility)

Tag	Private Owner Code	Name	VR	VM	Notes
(0009,00xx)	SIEMENS CT VA1 DUMMY	Private Creator Data Element	LO	1	1

Private SOP class CSA Non-Image

This chapter includes the definition of the Siemens AG B Med CSA defined private Non-Image Object (called CsaNonImage IOD). The focus of this private Non-Image Object is to address the requirement for non-image data sets found in *syngo* based applications.

The MedCom Non-Image Information Object Definition specifies data sets that are converted from a non-DICOM format to a modality independent DICOM format.

Examples of such manufacturer model dependent data sets are:

❏ Raw Data

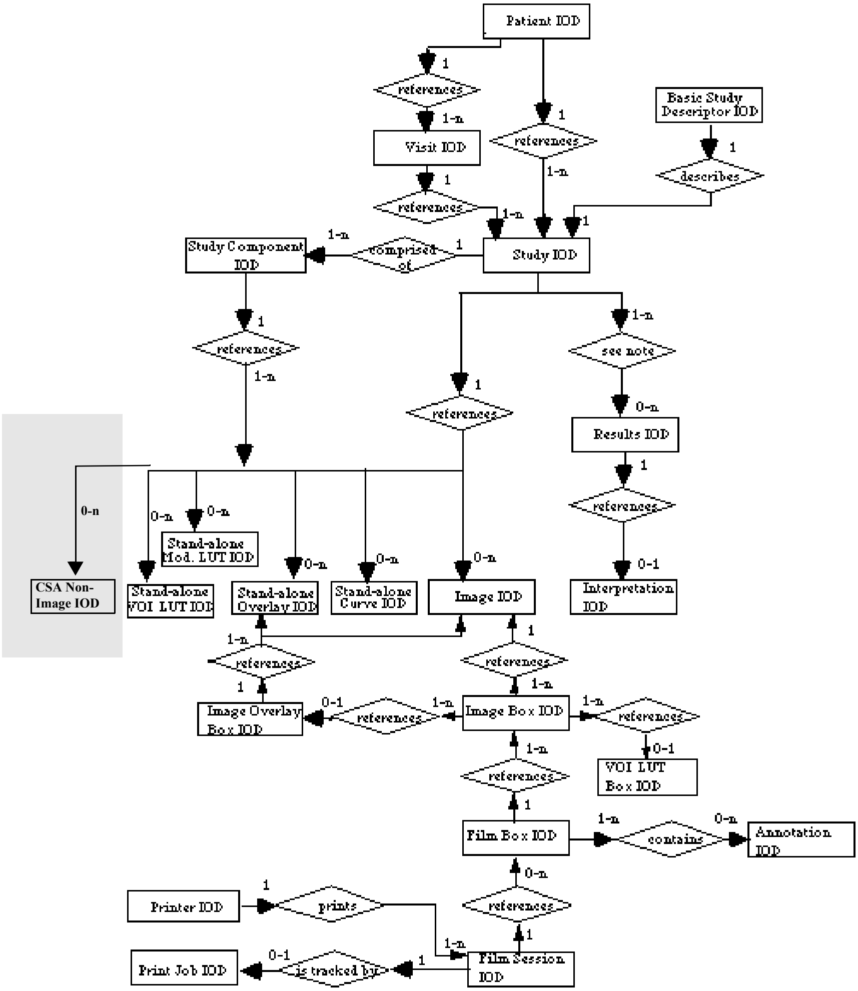
❏ CT Admin Data

❏ MR Spectroscopy Data

❏ etc.

CSA Non-Image IOD Entity Relationship Model

The E-R model in [DICOM] A.1.2 depicts those components of the DICOM Information Model which directly refer to the CSA Non-Image IOD. The frame of reference IE, overlay IE, modality look up table IE, VOI lookup table IE and curve IE are not components of the CSA Non-Image IOD.


Patient IOD
references
1
1-n
Visit IOD
references
1
1-n
Basic Study Descriptor IOD
describes
1
Study Component IOD
comprised of
1-n
1
Study IOD
references
1
1-n
see note
1-n
0-n
Results IOD
references
1
0-1
Interpretation IOD
references
1
CSA Non-Image IOD
0-n
Stand-alone VOI LUT IOD
0-n
Stand-alone Mod. LUT IOD
0-n
Stand-alone Overlay IOD
0-n
Stand-alone Curve IOD
0-n
Image IOD
0-n
references
1-n
1
Image Overlay Box IOD
references
0-1
1-n
Image Box IOD
references
1
1-n
references
1-n
0-1
VOI LUT Box IOD
references
1-n
1
Film Box IOD
contains
1-n
0-n
Annotation IOD
references
0-n
1
Printer IOD
prints
1
1-n
Film Session IOD
Print Job IOD
is tracked by
0-1
1

CSA Non-Image IOD Module Table

IE	Module	Reference	Usage
Patient	Patient	[1] PS 3.3 C.7.1.1	M
Study	General Study	[1] PS 3.3 C.7.2.1	M
	Patient Study	[1] PS 3.3 C.7.2.2	U
Series	General Series	[1] PS 3.3 C.7.3.1	M
Equipment	General Equipment	[1] PS 3.3 C.7.5.1	U
CSA	CSA Image Header	→ page A.4–57, CSA Image Header Module	U
	CSA Series Header	→ page A.4–57, CSA Series Header Module	U
	MEDCOM Header	→ page A.4–58, MEDCOM Header Module	U
	CSA Non-Image	→ page A.4–73, CSA Non-Image Module	M
	SOP Common	[1] PS 3.3 C.12.1	M

CSA Non-Image Module

The table in this section contains private IOD Attributes that describe CSA Non-Images.

Attribute Name	**Tag**	**Private Creator**	**Type**	**Notes**
Image Type	(0008,0008)	-	3	Image identification characteristics. See → page A.4–76, CT Extensions of the Non-Image Object
Acquisition Date	(0008,0022)	-	3	The date the acquisition of data that resulted in this data set started.
Acquisition Time	(0008,0032)	-	3	The time the acquisition of data that resulted in this data set started.
Conversion Type	(0008,0064)	-	3	Describes the kind of image conversion. Defined Terms: DV = Digitized Video, DI = Digital Interface, DF = Digitized Film, WSD = Workstation.
Referenced Image Sequence	(0008,1140)	-	3	A sequence which provides reference to a set of Image SOP Class/Instance identifying other images significantly related to this data set. Encoded as sequence of items: (0008,1150) and (0008,1155).
Derivation Description	(0008,2111)	-	3	A text description of how this data set was derived.
Source Image Sequence	(0008,2112)	-	3	A Sequence which identifies the set of Image SOP Class/Instance pairs of the Images which were used to derive this data set. Zero or more Items may be included in this Sequence. Encoded as sequence of items: (0008,1150) and (0008,1155).

Attribute Name	Tag	Private Creator	Type	Notes
Patient Position	(0018,5100)	-	3	Patient position descriptor relative to the equipment.
Acquisition Number	(0020,0012)	-	3	A number identifying the gathering of data over a period of time which resulted in this data set.
Instance Number	(0020,0013)	-	3	A number that identifies this data set.
Frame of Reference UID	(0020,0052)	-	3	Uniquely identifies the frame of reference for a Series.
Image Comments	(0020,4000)	-	3	User-defined comments about the image.
Quality Control Image	(0028,0300)	-	3	Indicates whether or not this image is a quality control or phantom image. If this Attribute is absent, then the image may or may not be a quality control or phantom image. Enumerated Values: YES, NO.
Burned In Annotation	(0028,0301)	-	3	Indicates whether or not image contains sufficient burned in annotation to identify the patient and date the image was acquired. If this Attribute is absent, then the image may or may not contain burned in annotation. Enumerated Values: YES, NO.
Lossy Image Compression	(0028,2110)	-	3	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression, 01 = Image has been subjected to lossy compression.

Attribute Name	Tag	Private Creator	Type	Notes
Lossy Image Compression Ratio	(0028,2112)	-	3	Describes the approximate lossy compression ratio(s) that have been applied to this image. May be multi valued if successive lossy compression steps have been applied.
CSA Data Type	(0029,xx08)	SIEMENS CSA NON-IMAGE	1	CSA Data identification characteristics. Defined Terms: RAW DATA NUM 4 = NUMARIS/4 Raw Data SPEC NUM 4 = NUMARIS/4 Spectroscopy RAW DATA SOM 5 = Somaris/5 Raw Data RAW DATA SOM 7 = Somaris/7 Raw Data BSR REPORT = BSR Study Report Data COL REPORT SOM5 = *syngo* Colonography Report Data
CSA Data Version	(0029,xx09)	SIEMENS CSA NON-IMAGE	3	Version of CSA Data Info (0029,xx10) format and CSA Non-Image Data (7FE1,xx10) format.
CSA Data Info	(0029,xx10)	SIEMENS CSA NON-IMAGE	3	Information to describe the CSA Data (7FE1,xx10). The value of the attribute CSA Data Info (0029,xx10) can be build up in each user defined format.
CSA Data	(7FE1,xx10)	SIEMENS CSA NON-IMAGE	1	Binary data as byte stream.

CT Extensions of the Non-Image Object

Somaris/7 uses the following defined term for Image Type (0008,0008):

- ❏ Value 1: ORIGINAL
- ❏ Value 2: PRIMARY
- ❏ Value 3: AXIAL, LOCALIZER, OTHER
- ❏ Value4: a CT_SOM5 * enumeration
- ❏ Value5: Somaris/7 specific enumeration

The following table lists the Somaris/7 non-image types and the corresponding combinations of the Image Type Attribute values.

Description	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5
CAD Results	DERIVED	SECONDARY	OTHER	CAD MARKS	none
Colonography Data	DERIVED	SECONDARY	OTHER	CT_SOM5 COL	none
Coronary Tree	DERIVED	SECONDARY	OTHER	CT_CIRCULATION	none
Raw Data	Same entries as for images				

Private SOP Classes

SOP Class Name	SOP Class UID
CSA Non-Image	1.3.12.2.1107.5.9.1

Private Transfer Syntaxes

Not applicable.

CHAPTER A.5 Configuration

AE Title / Presentation Address Mapping

To ensure unique identification the hostname should be part of the AE Titles (see examples below, hostname = station4). The string can be up to 16 characters long and must not contain any extended characters, only 7 bit ASCII characters (excluding control characters) are allowed according to DICOM standard. An example name is HRI_station4. Another common setting is the use of the hostname in capital letters, e.g. "STATION4".

> **Note**
>
> The current implementation does not support the full DICOM standard syntax. Spaces and special characters (like &<>") in the AE title string are not supported.

DICOM Verification

The Verification Service uses the AE configuration of the DICOM Service that is checked with the C-ECHO message. E.g. Verification will use the Storage AE, if initiated to check the configuration of a remote DICOM node.

DICOM Storage/StorageCommitment/QR AE Title

There is a common AE Title for Storage, Storage Commitment and Query/Retrieve. It can be configured via Service UI in Configuration/DICOM/General.

The port is set to the fixed value of 104.

DICOM Modality Worklist and MPPS AE Title

There is a common AE Title for Modality Worklist and MPPS. It can be configured via Service UI in Configuration/DICOM/General.

DICOM Print AE Title

There is a separate AE Title for Print application. It can be configured via Service UI in Configuration/DICOM/General.

No input of AETs starting with a numeric character is possible.

Remote AE Titles and Presentation Addresses

Remote AETs, host names, IP addresses and port numbers can be configured using the Service application. For each AET a list of supported services can be configured.

Configurable Parameters

The Application Entity Titles, host names and port numbers for remote AE are configured using the Somaris/7 Service/ Installation Tool. For each AET the list of services supported can be configured.

Storage, Storage Commitment and Query/Retrieve

- ☐ a quality factor which determines the proposed transfer syntax in case that an user has initiated the C-STORE. By convention, 0 means: Only Uncompressed Transfer Syntax(es) are proposed, 100 means: Lossless Transfer Syntax is proposed, and any other value between 1 and 99 means that an JPEG Lossy Transfer Syntax is proposed. One Uncompressed Transfer Syntax will be proposed in any case. This parameter is general for all destination nodes.
- ☐ a "compression type supported" which determines the proposed transfer syntax in case that the C-STORE was initiated as a sub-operation of an incoming C-MOVE-RQ. By convention, 0 means: Only Uncompressed Transfer Syntax(es) are proposed, 1 means: Lossless Transfer Syntax is proposed, and 2 means that an JPEG Lossy Transfer Syntax is proposed. One uncompressed transfer syntax will be proposed in any case. This parameter can be set for each configured destination node.

Note:

By default association requests are accepted by the SCP regardless of the value of DICOM Application Context Name set in the requests.

This behavior can be changed by modifying the value of the entry ACCEPT_ANY_CONTEXT _NAME in the configuration file mergecom.pro of MergeCOM-3 Tool Kit. If the value is FALSE, association requests are accepted only when DICOM Application Context Name is set to "1.2.840.10008.3.1.1.1" (see DICOM specification PS 3.7-2003, A.2.1)

Additional configurable parameters for Storage Commitment are:

When acting as SCU:

❑ Flag to indicate whether the association will be kept open to receive the response or to close the association and be prepared to receive the response on another association.

❑ Time-out which defines how long the association of N-ACTION is kept to receive a N-EVENT-REPORT on the same association. The same value is used to wait for a N-EVENT-REPORT on another association (applicability of transaction UID).
(default 1 h)

When acting as SCP:

flag to indicate whether an archive system is installed.

Print

The Service application can be used to configure the SCP (DICOM Printer).

These parameters are mandatory to be set:
❏ AET
❏ Host name
❏ IP address
❏ Port number

These parameters have defaults as per configuration file and can be changed:
❏ Default camera
❏ Pixel size
❏ Additional or changed film sheet formats (e.g. inch 14x14, inch 14x17, ...)
❏ List with mapping pixel size to each film sheet format
❏ Minimal density
❏ Stored printed film jobs
❏ Media type
❏ Film destination

Modality Worklist

The Service application can be used to set the AETs, port numbers, host names, IP addresses, capabilities, and time-outs for the remote nodes (SCPs).

Additional configurable parameters for Basic Worklist Query are:

- ❏ Query Waiting time - the time to wait for the C-FIND-RSP after sending the C-FIND-RQ (default 20 s)
- ❏ Max. Query Match Number - the maximum number of entries accepted in one worklist (default is 200)
- ❏ Query Interval - the time between two C-FIND-RQs to the Hospital Information System (default is 60 min)
- ❏ Broad Worklist Query behaviour: two values are defined:
  Set the AE Title search attribute to the own AE Title, and the Modality search attribute to "*".
  Set the Modality search attribute to the own modality and the AE Title search attribute to "*".

The sending of an empty Specific Character Set in a C-FIND-RQ can be omitted by configuration. However, this is not available in the Service application but must be set by a Siemens service technician.

Modality Performed Procedure Step

The Service application can be used to configure the Modality Worklist SCP to be a Modality Performed Procedure Step SCP also.

Additional configurable parameters for Modality Performed Procedure Step are:

- ❏ Default Catalog Name - (0008,0102) used for items entered in MPPS UI
- ❏ Default Catalog Version - (0008,0103) used for items entered in MPPS UI

Default Parameters

This configuration tool also uses some default parameters:

- ❏ maximal PDU size set to 262144 Bytes
- ❏ time-out for accepting/rejecting an association request: 60 s
- ❏ time-out for responding to an association open/close request: 60 s
- ❏ time-out for accepting a message over network: 60 s
- ❏ time-out for waiting for data between TCP/IP-packets: 60 s

The Time-outs for waiting for a service Request/Response message from the remote node are as follows:

- ❏ for Storage SCP/SCU: 600 s
- ❏ for Storage Commitment SCU:
  time-out for Response to N-ACTION: 600 s
  time-out for N-EVENT-REPORT: configurable, see → page A.5–3, *Configurable Parameters.*
- ❏ for Query/Retrieve SCP/SCU: 600 s
- ❏ for Modality Worklist SCU: configurable, see → page A.5–3, *Configurable Parameters.*
- ❏ for Print Management SCU:
  time-out for Response to N-SET-RQ: 240 s
  time-out for Response to other Requests: 60 s

CHAPTER

A.6

Support of Extended Character Sets

The Somaris/7 DICOM application supports the following character sets as defined in the four tables below:

The following is Single-Byte Character Sets without Code

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

Character Set Description	Defined Term	ISO Registration Number	Character Set
		ISO_IR 14	JIS X 0201:Romaji

The following table shows Single-Byte Character 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
Cyrillic	ISO 2022 IR 144	ISO 2022	ESC 02/13 04/12	ISO_IR 144	Supplementary set

Character Set Description	Defined Term	Standard for Code Extension	ESC Sequence	ISO Registration Number	Character Set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Arabic	ISO 2022 IR 127	ISO 2022	ESC 02/13 04/07	ISO_IR 127	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Greek	ISO 2022 IR 126	ISO 2022	ESC 02/13 04/06	ISO_IR 126	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Hebrew	ISO 2022 IR 138	ISO 2022	ESC 02/13 04/08	ISO_IR 138	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Latin alphabet No.5	ISO 2022 IR 148	ISO 2022	ESC 02/13 04/13	ISO_IR 148	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Japanese	ISO 2022 IR 13	ISO 2022	ESC 02/13 04/09	ISO_IR 13	JIS X 0201:Katakana
		ISO 2022	ESC 02/08 04/02	ISO_IR 14	JIS X 0201-1976:Romaji

The following table shows 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

Character Set Description	Defined Term	ISO Registration Number	Character Set
Chinese	GB18030	GB18030	GB 18030-2000 (China Association for Standardization)

The following table shows 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 87	ISO 2022	ESC 02/04 04/02	ISO_IR 87	JIS X 0208: Kanji
	ISO 2022 IR 159	ISO 2022	ESC 02/04 02/08 04/04	ISO_IR 159	JIS X 2012: Supplementary Kanji set
Chinese[a]	ISO 2022 IR 58	ISO 2022	ESC 02/04 04/01	ISO_IR 58	GB2312-80 (China Association for Standardization)

---

[a] This Character Set is an extension of DICOM for the chinese language.

When there is a mismatch between the SCS tags (0008,0005) and the characters in an IOD coming into the system, then the following measures are taken to make the characters DICOM conform:

- ❏ Try to import with ISO-IR 100. If ISO-IR 100 also fails convert each illegal character to'?'.

There are now 3 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 is not DICOM conform. As these kinds of inconsistencies cannot be recognized by the system, the IOD will not be rejected but the character data might be corrupted

Older versions of *syngo* do not support the newly introduced character sets ISO_IR 192 and GB18030 and their special encodings. That means, an IOD which contains one of these new character sets in (0008,0005) will be rejected by an older *syngo* system.

PART
B

DICOM Conformance Statement

Part II - Media Storage

This part contains the Conformance Statement to all "Offline Media Application Profiles (incl. private extensions)" supported by the Somaris/7 archive options.

The application profiles supported shall be:

❏ Standard Application Profiles

❏ Augmented Application Profiles

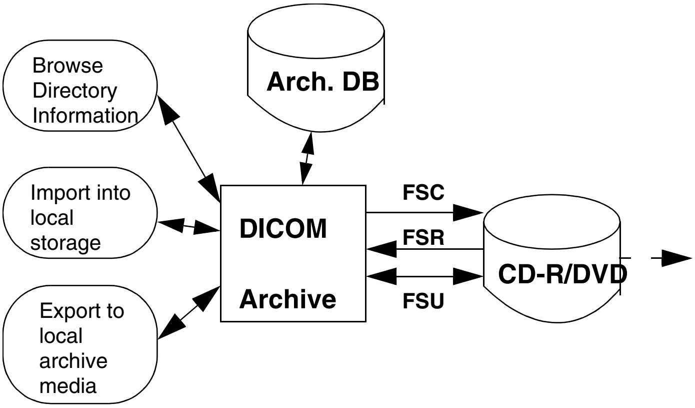
❏ *syngo* private Application Profiles

For general introductory topics see → page 5, *Introduction.*

CHAPTER
B.1

Implementation Model

Application Data Flow Diagram


Browse Directory Information
Import into local storage
Export to local archive media
Arch. DB
DICOM Archive
FSC
FSR
FSU
CD-R/DVD

The DICOM archive application will serve as an interface to the CD-R/DVD off-line medium device. It serves interfaces to include the off-line media directory into the browser and to copy SOP instances to a medium or retrieve SOP Instances from medium into local storage.

The DICOM Archive application will support 120 mm CD-R/DVD media (see Table → page B.2–1).

The FSU role will update new SOP Instances only to media with pre-existing File-sets conforming to the Application Profiles supported.

The contents of the DICOMDIR will be temporarily stored in Archive-Database.

Functional definitions of AE's

The Somaris/7 DICOM off-line media storage application consists of the DICOM Archive application entity serving all interfaces to access off-line media. The DICOM Archive application is capable of

✧ creating a new File-set onto an unwritten medium (Export to...)

✧ updating an existing File-set by writing new SOP Instances onto the medium

✧ importing SOP Instances from the medium onto local storage

✧ reading the File-set's DICOMDIR information temporarily into database and pass it to display applications.

Sequencing of Real-World Activities

The DICOM Archive application will not perform updates before the Directory information of the DICOMDIR is completely read.

When performing updates, the SOP instances are checked for existence before updating. Duplicate instances will be avoided.

File Meta Information Options

The Implementation Class UID is:

❏ "1.3.12.2.1107.5.1.4"

and an Implementation Version Name of

❏ "SIEMENS_S7VA20A"

CHAPTER B.2 AE Specifications

DICOM Archive Specification

The DICOM Archive provides Standard conformance to Media Storage Service Class (Interchange Option).

Application Profiles Supported	Real World Activity	Role	SC Option
PRI-SYNGO-CD PRI-SYNGO-DVD AUG-GEN-CD AUG-CTMR-CD[a] STD-XA1K-CD[a]	Browse Directory Information Import into local Storage Export to local archive media	FSR FSR FSC,FSU	Interchange Interchange Interchange
STD-GEN-CD STD-CTMR-CD STD-XABC-CD STD-XA1K-CD TD-US-zz-yF-xxxxxx[b]	Browse Directory Information Import into local Storage	FSR FSR	Interchange Interchange

[a] With no private SOP Class used, the PRI-SYNGO-CD profile definitions are appropriate to describe the augmentation of the related -STD Profiles.

[b] All combinations of the following values for zz, yF and xxxxxx are suported:
’yF’ can take two values: SF for Single Frame and MF for Multi Frame.
’zz’ can take three values: ID (Image Display), SC(Spatial Calibration) and CC (Combined Calibration)
xxxxxx can take 2 values: CDR and DVD

On synngo-based products the Private Extended *syngo* Profile (e.g. PRI-SYNGO-CD) will be preferrably used by the system. The General Purpose Interchange Profile (STD-GEN-CD), Ultrasound Profile (STD-US-xxx), CT and MR Image Profile (STD-CTMR-xxx), Waveform Interchange (STD-WVFM-xxx), Basic Cardiac Profile (STD-XABC-CD) and 1024 X-Ray Angiographic Profile (STD-XA1K-CD) will be supported with read capability of the related media.

File Meta Information for the Application Entity

The Source Application Entity Title is set by configuration. See → Chapter B.5, *Configuration* for details.

Real-World Activities for this Application Entity

Real-World Activity: Browse Directory Information

The DICOM Archive application acts as FSR using the interchange option when requested to read the media directory.

The DICOM archive application will read the DICOMDIR and insert that directory entries, that are valid for the application profiles supported, into a local database. The database can then be used for browsing media contents.

Note

Icon Image SQ is also supported in DICOMDIR. But only those Icon Images with Bits Allocated (0028,0100) equal to 8 and size 64 by 64 or 128 by 128 pixels are imported into database and are visible in PatientBrowser.

Application Profiles for the RWA: Browse Directory Information

See table → page B.2–1 for the Application Profiles listed that invoke this Application Entity for the Browse Directory Information RWA.

Real-World Activity: Import into local Storage

The DICOM Archive application acts as FSR using the interchange option when requested to read SOP Instances from the medium into the local storage.

The SOP Instance selected from the media directory will be copied into the local storage. Only SOP Instances, that are valid for the application profile supported and are listed as supported by the Storage SCP Conformance section (→ page A.2–4), can be retrieved from media storage.This is due to the fact that the Browse Directory Information will filter all SOP Instances not matching the Application profiles supported.

During operation no "Attribute Value Precedence" is applied to the SOP Instances. Detached Patient Management is not supported (please refer to DICOM part 11, Media Storage Application Profiles).

For media conforming to the STD-GEN-CD Profile the following SOP classes will be supported as a FSR:

Information Object Definitions	SOP Class UID	Transfer Syntax and UID
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

Information Object Definitions	SOP Class UID	Transfer Syntax and UID
MG Image - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
SC Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

Information Object Definitions	SOP Class UID	Transfer Syntax and UID
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Cardiac Elec-trophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
X-Ray Angigraphic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
X-Ray Radiofluoroscopic-Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

Information Object Definitions	SOP Class UID	Transfer Syntax and UID
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

Information Object Definitions	SOP Class UID	Transfer Syntax and UID
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Csa Non-Image	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

Application Profiles for the RWA: Import into local Storage

See table → page B.2–1 for the Application Profiles listed that invoke this Application Entity for the Import to Local Storage RWA.

Real-World Activity: Export to local Archive Media

The DICOM Archive 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 DICOM Archive application will receive a list of SOP Instances to be copied to the local archive medium. According to the state of the medium inserted (new medium, Medium with DICOM file-set) the validity of the SOP Instances according to the applicable profile is checked. Only valid SOP Instances are accepted.

When the DICOM archive application is requested to copy SOP Instances the preferred application profile according configuration will be used to validate and copy the referred SOP Instances. When creating a new file set no Descriptor File will be allocated and the related ID is not used.

The DICOM archive application will not close the medium.

Application Profiles for the RWA: Export to local Archive Media

See table → page B.2–1 for the Application Profiles listed that invoke this Application Entity for the Export to local Archive Media RWA.

CHAPTER
B.3

Augmented and Private Profiles

Augmented Application Profiles

AUG-GEN-CD

With no private Siemens Non-Images stored onto Medium, the definitions of the PRI-SYNGO-CD Profile are applicable to denote the augmentations for the STD-GEN-CD Standard Profile.

Storage of Private Information Objects will only be supported with reference to a Private Application Profile (see next section).

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

AUG-CTMR-xxxx

With no private Siemens Non-Images stored onto Medium, the definitions of the PRI-*SYNGO*-CD Profile are applicable to denote the augmentations for the and STD-CTMR-CD Standard Profiles.

Storage of Private Information Objects will only be supported with reference to a Private Application Profile (see next section).

AUG-XA1K-CD

With no private Siemens Non-Images stored onto Medium, the definitions of the PRI-SYNGO-CD Profile are applicable to denote the augmentations for the STD-XA1K-CD Standard Profile.

Storage of Private Information Objects will only be supported with reference to a Private Application Profile (see next section).

syngo® *private offline Media Application Profile*

This section will contain a *syngo* specific Application Profile.

Thel Structure of this Application Profile is defined in Part 11 of the 2000 DICOM Standard.

It is needed to describe the requirements for Offline Media Storage of the private IOD (Non-Image IOD).

Class and Profile Identification

This document defines an Application Profile class for "*syngo*® speaking[1]" modalities or applications.

The identifier for this class shall be PRI-SYNGO. This class is intended to be used for interchange of extended and private Information Objects via CD-R offline media between dedicated acquisition or workstation modalities built from a common *syngo* architecture.

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[1] '*syngo*' and '*We speak syngo*' are registered trademarks of Siemens AG

The specific application profiles in this class are shown in the table below:

Application Profile	**Identifier**	**Description**
"*syngo* speaking" System on CD-R	PRI-SYNGO-CD	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD)
"*syngo* speaking" System on DVD R	PRI-SYNGO-DVD	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD)

Equipment claiming conformance for this *syngo* Application Profile Class shall make a clear statement on handling of the private defined SOP Instances.

Clinical Context

This application profile facilitates the interchange of original acquired and derived images and private data related to them. Typical media interchange would be from in-lab acquisition equipment to dedicated workstations and archive systems with specific extensions to handle the private data objects (in both directions).

Additionally, images used to prepare procedures, multi-modality images (e.g. integrated US) and images derived from primary diagnostic images, such as annotations, quantitative analysis images, reference images, screen capture images may be interchanged via this profile.

Roles and Service Class Options

This Application Profile uses the Media Storage Service Class defines in PS 3.4 with the Interchange Option.

The Application Entity shall support one or more of the roles of File Set Creator (FSC), File Set Reader (FSR), and File Set Updater (FSU), defined in PS3.10.

File Set Creator

The Application Entity acting as File Set Creator generates a File Set under the PRI-SYNGO Application Profiles.

File Set Creators shall be able to generate the Basic Directory SOP Class in the DICOMDIR file with all the subsidiary Directory Records related to the Image SOP Classes and Private SOP Classes stored in the File Set.

In case of the PRI-SYNGO-CD and PRI-SYNGO-DVD profile, the FSC shall offer the ability to allow multi-session (additional information may be subsequently added to the disc). For both profiles a multi-session media can be finalized.

Note

A multiple volume (a logical volume that can cross multiple phydical media) is not supported by this Application Profile Class. If a set of Files, e.g., a Study, cannot be written entirely on one CD-R, the FSC will create multiple independent DICOM File Sets such that each File Set can reside on a single CD-R medium controlled by its individual DICOMDIR file. The user of the FSC can opt to use written labels on the discs to reflect that there is more than one disc for this set of files (e.g. a study).

File Set Reader

The role of the File Set Reader shall be used by Application Entities which receive the transferred File Set.

File Set Readers shall be able to read all the defined SOP Instances files defined for the specific Application Profiles to which a conformance claim is made, using all the defined Transfer Syntaxes.

File Set Updater

The role of the File Set Updater shall be used by Application Entities, which receive a transferred File Set and update it by the addition of processed information.

File Set Updaters shall be able to read and update the DICOMDIR file. File Set Updaters do not have to read the image/private information objects. File Set Updaters shall be able to generate any of the SOP Instance files defined for the specific Application Profiles to which a conformance claim is made, and to read and update the DICOMDIR file.

In case of the PRI-SYNGO-CD and PRI-SYNGO-DVD profile, the FSU shall offer the ability to allow multi-session (additional information can be subsequently added to the disc).

Note (for CD-R and DVD-R)

If the disc has not been finalized, the File Set Updater will be able to update information assuming there is enough space on the disc to write a new DICOMDIR file, the information, and the fundamental CD-R/DVD-R control structures. CD-R/DVD-R control structures are the structures that inherent to CD-R/DVD-R standards; see PS 3.12

PRI-SYNGO *Profiles*

SOP Classes and Transfer Syntaxes

These Application Profiles are based on the Media Storage Service Class with the Interchange Option. In the table below Transfer Syntax UID "RLE Lossless" applies ony for decompression.

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	M
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
CR Image	1.2.840.10008.5.1.4.1.1.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	O	O
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
DX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	O	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG Lossless 1.2.840.10008.1.2.90	O	O	O
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG Lossy 1.2.840.10008.1.2.91	O	O	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
MG Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
MG Image - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
MG Image - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
MG Image - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
MG Image - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
MG Image - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
MG Image - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossless 1.2.840.10008.1.2.90	O	O	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossy 1.2.840.10008.1.2.91	O	O	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	O	O
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	-	M	-
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	-	M	-
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	-	M	-

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	-	M	-
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	RLE Lossless 1.2.840.10008.1.2.5	-	M	-
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG 2000 Lossless 1.2.840.10008.1.2.90	-	M	-
US-MF image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG 2000 Lossy 1.2.840.10008.1.2.91	-	M	-
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG 2000 Lossy 1.2.840.10008.1.2.90	O	O	O
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	-	M	-

Information Object Definitions	**SOP Class UID**	**Transfer Syntax and UID**	**FSC**	**FSR**	**FSU**
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	-	M	-
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	-	M	-
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	-	M	-
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	RLE Lossless 1.2.840.10008.1.2.5	-	M	-
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG 2000 Lossless 1.2.840.10008.1.2.90	-	M	-
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG 2000 Lossy 1.2.840.10008.1.2.91	-	M	-
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
US Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
US Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
US Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
US Image	1.2.840.10008.5.1.4.1.1.6.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
US Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	M	O
US Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	M	O
SC Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
SC Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
SC Image	1.2.840.10008.5.1.4.1.1.7	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	O	O
Waveform Storage SOP Classes	1.2.840.10008.5.1.4.1.1.9.1.1 1.2.840.10008.5.1.4.1.1.9.1.2 1.2.840.10008.5.1.4.1.1.9.1.3 1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1 1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Waveform Storage SOP Classes	1.2.840.10008.5.1.4.1.1.9.1.1 1.2.840.10008.5.1.4.1.1.9.1.2 1.2.840.10008.5.1.4.1.1.9.1.3 1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1 1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O

Information Object Definitions	**SOP Class UID**	**Transfer Syntax and UID**	**FSC**	**FSR**	**FSU**
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	M	O
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O

Information Object Definitions	**SOP Class UID**	**Transfer Syntax and UID**	**FSC**	**FSR**	**FSU**
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	M	O
X-Ray Radioflouroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG 2000 Lossless 1.2.840.10008.1.2.91	O	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
NM Image	1.2.840.10008.5.1.4.1.1.20	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG 2000 Lossless 1.2.840.10008.1.2.91	O	O	O
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG Lossless Process 14 NON-HIER 1.2.840.10008.1.2.4.57	-	M	-
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O

Information Object Definitions	**SOP Class UID**	**Transfer Syntax and UID**	**FSC**	**FSR**	**FSU**
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG 2000 Lossless 1.2.840.10008.1.2.90	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG 2000 Lossy 1.2.840.10008.1.2.91	O	O	O
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Csa Non-Image	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O

FSC, FSR, FSU - denote the requirement for those roles

O - Optional

M - Mandatory

Physical Media and Formats

The PRI-SYNGO-CD Profile requires the 120mm CD-R physical media with the ISO/IEC 9660 Media Format, as defined in PS3.12.

The PRI-SYNGO-DVD Profile requires the 120mm DVD-R physical media with the UDF 2.01 Media Format, as defined in PS3.12.

Directory Information in DICOMDIR

Conforming Application Entities shall include in the DICOMDIR File the Basic Directory IOD containing Directory Records at the Patient and subsidiary levels appropriate to the SOP Classes in the File Set. All DICOM files in the File Set incorporating SOP instances defined for the specific Application Profile shall be referenced by Directory Records.

Note

DICOMDIRs with no directory information are not allowed by this Application Profile

Privately defined IODs will be referenced by "PRIVATE" Directory Records.

Basic Directory IOD Specification

This Application Profile makes use of optional attributes of the Basic Directory IOD to support recognition of Patient's Storage Service request results in spanning multiple volumes (file sets). Therefore the File Set Descriptor File can be used and is then referenced by optional Basic Directory IOD attributes. If existent, the specified Descriptor File may be used by FSR applications. Any FSU, FSC shall make a clear statement if the Descriptor File mechanism is used according to the specialization defined in this Application Profile.

The Descriptor Files shall have the following contents:

One single line without any control characters and according to the Basic Character Set having the following defined text:

"MULTIVOLUME: xx of yy"

xx, yy are replaced by the actual number of the volume (xx) and the total number of volumes in the set (yy).

If used, the Descriptor File shall have the File ID "README" and reside in the same directory level as the DICOMDIR. It is referenced by the attribute [0004,1141] File Set Descriptor File ID having the defined contents of "README".

Additional Keys

File Set Creators and Updaters are required to generate the mandatory elements specified in PS 3.3, Annex F of the DICOM Standard. Table below: PRI-SYNGO-CD Additional DICOMDIR Keys specifies the additional associated keys. At each directory record level other additional data elements can be added, but it is not required that File Set Readers be able to use them as keys. Refer to the Basic Directory IOD in PS 3.3.

Attribute Name	Tag	Directory Record Level	Type	Notes
Date Of Birth	(0010,0030)	PATIENT	2C	required, if present in SOP Instance
Patient’s Sex	(0010,0040)	PATIENT	2C	required, if present in SOP Instance
Series Date	(0008,0021)	SERIES	3	
Series Time	(0008,0031)	SERIES	3	
Institution Name	(0008,0080)	SERIES	2C	required, if present in SOP Instance
Institution Address	(0008,0081)	SERIES	2C	required, if present in SOP Instance
Series Description	(0008,103E)	SERIES	3	
Performing Physician’s Name	(0008,1050)	SERIES	2C	required, if present in SOP Instance
Image Type	(0008,0008)	IMAGE	1C	required, if present in SOP Instance
SOP Class UID	(0008,0016)	IMAGE	3	
SOP Instance UID	(0008,0018)	IMAGE	3	
Image Date	(0008,0023)	IMAGE	3	

Attribute Name	**Tag**	**Directory Record Level**	**Type**	**Notes**
Image Time	(0008,0033)	IMAGE	3	
Content Date	(0008,0023)	IMAGE	3	
Content Time	(0008,0033)	IMAGE	3	
Referenced Image Sequence	(0008,1140)	IMAGE	1C	required, if present in SOP Instance
> Referenced SOP Class UID	(0008,1150)			
> Referenced SOP Instance UID	(0008,1155)			
Image Position (Patient)	(00020,0032)	IMAGE	2C	required, if present in SOP Instance
Image Orientation (Patient)	(0020,0037)	IMAGE	2C	required, if present in SOP Instance
Frame Of Reference UID	(0020,0052)	IMAGE	2C	required, if present in SOP Instance
Rows	(0028,0010)	IMAGE	3	
Columns	(0028,0011)	IMAGE	3	
Pixel Spacing	(0028,0030)	IMAGE	1C	C
Calibration Image	(0050,0004)	IMAGE	2C	required, if present in SOP Instance
Icon Image Sequence	(0088,0200)	IMAGE	3	required for Image SOP Classes
> Samples per Pixel	(0028,0002)			1

Attribute Name	Tag	Directory Record Level	Type	Notes
> Photometric Interpretation	(0028,0004)			MONOCHROME2
> Rows	(0028,0010)			128 for XA IOD, 64 otherwise
> Columns	(0028,0011)			128 for XA IOD, 64 otherwise
> Bits Allocated	(0028,0100)			8
> Bits Stored	(0028,0101)			8
> High Bit	(0028,0102)			7
> Pixel Representation	(0028,0103)			0 (unsigned)
> Pixel Data	(7FE0,0010)			Icon Image pixel data
Curve Number	(0020,0024)	CURVE	1C	required, if present in SOP Instance

Private Directory Record Keys	Private Directory Records are supproted by this Application Profile Class at the following level: IMAGE The PRIVATE Directory Records will have required elements in addition to the mandatory elements specified in PS 3.3. The following table will list the additional required keys for PRIVATE Directory Records.

Attribute Name	Tag	Directory Record Level	Type	Notes
Private Record UID	(0004, 1432)	PRIVATE	1	See Conformance Statement
SOP Class UID	(0008, 0016)	PRIVATE	1C	required, if present in SOP Instance
SOP Instance UID	(0008, 0018)	PRIVATE	1C	required, if present in SOP Instance
Image Type	(0008, 0008)	PRIVATE	3	identification characteristics
Acquisition Date	(0008, 0022)	PRIVATE	3	
Acquisition Time	(0008, 0032)	PRIVATE	3	
Acquisition Number	(0020, 0012)	PRIVATE	3	
CSA Data Type	(0029, xx08)	PRIVATE	1	private owner code = SIEMENS CSA NON-IMAGE
CSA Data Version	(0029, xx09)	PRIVATE	3	private owner code = SIEMENS CSA NON-IMAGE

Icon Images

Directory Records of type SERIES or IMAGE may include Icon Images. The Icon Image Pixel data shall be as specified in PS 3.3 "Icon Imge Key Definition", and restricted such, that Bits Allocated (0028,0100) and Bits Stored (0028,0101) shall be equal to 8, an d Rows (0028,0010) and Columns (0028, 0011) shall be equal to 128 for XA Images and 64 for all other images. The Photometric interpretation (0028,0004) shall always be restricted to "MONOCHROME2".

PRIVATE Directory Records will not contain Icon Image information.

Other Parameters

This section defines other parameters common to all specific Application Profiles in the PRI-SYNGO class which need to be specified in order to ensure interoperable media interchange.

Multiframe JPEG Format

The JPEG encoding of pixel data shall use Interchange Format (with table specification) for all frames.

CHAPTER
B.4

Extensions, Specializations and Privatizations of

SOP Classes and Transfer Syntaxes

The SOP Classes listed refer in majority to those created by the equipment to which this Conformance Statement is related to. For SOP classes not listed in this section, please refer to the Storage section of the DICOM Conformance Statement of the product. This will include all SOP Instances that can be received and displayed and therefore will be included into offline media storage even though these SOP Instances are not created by the equipment serving the Media Storage Service.

SOP Specific Conformance Statement for Basic Directory

Extension, Specialization for SIEMENS Non-Image Objects

According to the PRI-SYNGO Application Profile Class the usage of the Private Creator UIDs and further optional keys for the Directory Records referring to SIEMENS Non-Image Objects are listed in the following table.

Attribute	**Tag**	**Value used**
Private Record UID	(0004,1432)	1.3.12.2.1107.5.9.1
SOP Class UID	(0008,0016)	1.3.12.2.1107.5.9.1

For the Non-Images no Icon Image Sequence will be generated.

CHAPTER

B.5 Configuration

AE Title Mapping

DICOM Media Storage AE Title

The DICOM Storage application (Image Manager) provides the application entity title:

CsaImageManager

CHAPTER
B.6

Support of Extended Character Sets

The Somaris/7 DICOM application supports the following character sets as defined in the four tables below:

The following table shows Single_Byte Character Sets without Code Extenension:

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

Character Set Description	Defined Term	ISO Registration Number	Character Set
		ISO_IR 14	JIS X 0201:Romaji

The following table shows Single-Byte Character 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

Character Set Description	Defined Term	Standard for Code Extension	ESC Sequence	ISO Registration Number	Character Set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Cyrillic	ISO 2022 IR 144	ISO 2022	ESC 02/13 04/12	ISO_IR 144	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Arabic	ISO 2022 IR 127	ISO 2022	ESC 02/13 04/07	ISO_IR 127	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Greek	ISO 2022 IR 126	ISO 2022	ESC 02/13 04/06	ISO_IR 126	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Hebrew	ISO 2022 IR 138	ISO 2022	ESC 02/13 04/08	ISO_IR 138	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Latin alphabet No.5	ISO 2022 IR 148	ISO 2022	ESC 02/13 04/13	ISO_IR 148	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO_IR 6	ISO 646
Japanese	ISO 2022 IR 13	ISO 2022	ESC 02/13 04/09	ISO_IR 13	JIS X 0201:Katakana
		ISO 2022	ESC 02/08 04/02	ISO_IR 14	JIS X 0201-1976:Romaji

The following table shows 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)

The following table shows 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 87	ISO 2022	ESC 02/04 04/02	ISO_IR 87	JIS X 0208: Kanji
	ISO 2022 IR 159	ISO 2022	ESC 02/04 02/08 04/04	ISO_IR 159	JIS X 2012: Supplementary Kanji set
Chinese[a]	ISO 2022 IR 58	ISO 2022	ESC 02/04 04/01	ISO_IR 58	GB2312-80 (China Association for Standardization)

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[a] This Character Set is an extension of DICOM for the chinese language.

When there is a mismatch between the SCS tags (0008,0005) and the characters in an IOD coming into the system, then the following measures are taken to make the characters DICOM conform:

❑ Try to import with ISO-IR 100. If ISO-IR 100 also fails convert each illegal character to'?'.

There are now 3 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 is not DICOM conform. As these kinds of inconsistencies cannot be recognized by the system, the IOD will not be rejected but the character data might be corrupted

Older versions of *syngo* do not support the newly introduced character sets ISO_IR 192 and GB18030 and their special encodings. That means, an IOD which contains one of these new character sets in (0008,0005) will be rejected by an older *syngo* system.

ANNEX

Annex

Siemens Private Non-Image IOD

Please see section
→ page A.4–70, *Private SOP class CSA Non-Image*.

Siemens Standard Extended Modules

Please see section
→ page A.4–56, *All syngo Supported Image SOP Classes*.

Siemens Standard Extended Modules

Please see section
→ page A.4–52, *Registry of DICOM Data Elements*
and → page A.4–67, *Registry of DICOM Data Elements*.

Standard Extensions of all SOP Classes

Please see section
→ page A.4–1, *Standard Extensions of all SOP Classes*.

DICOM Print SCU - detailed status displays

Please see section
→ page A.2–118, *DICOM Print SCU - detailed status displays*.

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