

DICOM Conformance Statement

PRIMUS 200

Version 2.2

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1 Conformance Statement Overview

The PRIMUS 200 instrument is used for in-vivo viewing of axial cross sections of anterior & posterior ocular structures and measurement of posterior ocular structures.

The PRIMUS 200 instrument is a non-contact, high resolution tomographic and biomicroscopic imaging device. It is indicated for in-vivo viewing, axial cross-sectional imaging and measurement of posterior ocular structures, including retina, retinal nerve fiber layer, macula, and optic nerve head as well as imaging of anterior ocular structures, including the cornea.

It is intended for use as a diagnostic device to aid in the detection and management of ocular diseases including, but not limited to, macular holes, cystoid macular edema, diabetic retinopathy, age-related macular degeneration, and glaucoma.

PRIMUS 200 implements one single DICOM Application Entity which allows to:

- query modality worklist
- query for patients
- archive evidence reports

This document is structured as suggested in the DICOM Standard (PS 3.2: Conformance).

Table 1-1 Network Services Supported

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Encapsulated PDF Storage	Yes	No
Workflow Management		
Storage Commitment Push Model SOP Class	Yes	No
Modality Worklist Information Model - FIND	Yes	No
Query / Retrieve		
Patient Root Query/Retrieve Information Model – FIND	Yes	No
Study Root Query/Retrieve Information Model – FIND	Yes	No

The PRIMUS 200 does not support Media Interchange.

2 Table of Contents

1	Conformance Statement Overview	2
2	Table of Contents	3
3	Introduction	5
3.1	Revision History	5
3.2	Audience	5
3.3	Remarks	5
3.4	Definitions and Terms	5
3.5	Abbreviations	7
3.6	References	8
4	Networking	9
4.1	Implementation Model	9
4.1.1	Application Data Flow	9
4.1.2	Functional Definition of AEs	10
4.1.2.1	Functional Definition of PRIMUS 200	10
4.1.3	Sequencing of Real-World Activities	10
4.1.3.1	Acquisition Modality activities	11
4.1.3.2	Scheduled case with Acquisition Modality	12
4.1.3.3	Unscheduled case	13
4.2	AE Specifications	14
4.2.1	PRIMUS 200 AE Specification	14
4.2.1.1	SOP Classes	14
4.2.1.2	Associations Policies	14
4.2.1.2.1	General	14
4.2.1.2.2	Number of Associations	14
4.2.1.2.3	Asynchronous Nature	14
4.2.1.2.4	Implementation Identifying Information	15
4.2.1.3	Association Initiation Policy	15
4.2.1.3.1	Activity – Verify Communication	15
4.2.1.3.2	Activity – Query Modality Worklist	16
4.2.1.3.3	Activity - Query remote AE for patients	23
4.2.1.3.4	Activity – Acquire data	30
4.2.1.3.5	Activity – Analyze data	30
4.2.1.3.6	Activity – Store reports to remote AE	30
4.2.1.3.7	Activity – Delete data	34
4.2.1.4	Association Acceptance Policy	34
4.2.1.4.1	Activity – Verify Communication	34
4.2.1.4.2	Activity – Archive data	35
4.3	Network Interfaces	37
4.3.1	Physical Network Interface	37
4.3.2	Additional Protocols	37
4.3.3	IPv4 and IPv6 Support	37
4.4	Configuration	37
4.4.1	AE Title/Presentation Address Mapping	37
4.4.1.1	Local AE Titles	37
4.4.1.2	Remote AE Titles	37
4.4.2	Parameters	37
4.4.2.1	General Parameters	37
5	Media Interchange	39
6	Support of Character Sets	40
7	Security	41
8	Annexes	42

8.1	IOD Contents.....	42
8.1.1	Created SOP Instance(s)	42
8.1.1.1	Encapsulated PDF Information Object Definition.....	43
8.1.2	Usage of Attributes from Received IOD's	50
8.1.3	Attribute Mapping.....	50
8.1.4	Coerced/Modified Files	51
8.2	Data Dictionary of Private Attributes	51
8.3	Coded Terminology and Templates	51
8.4	Greyscale Image Consistency	51
8.5	Standard Extended / Specialized/ Private SOP Classes.....	51
8.6	Private Transfer Syntaxes	51

3 Introduction

3.1 Revision History

Document Version	Date	Author	Changes
1.0	2014-12-18	Divyamol .K. C	Initial version
1.1	2015-06-11	Divyamol .K. C	Updated Encapsulated PDF IOD Module Overview Inserted final software version for PRIMUS 2.0: 2.0.634.0
1.2	2015-07-16	Divyamol K. C.	Update on chapter 1 and 4.1.2.1
1.3	2015-11-12	Divyamol K. C.	Modified for PRIMUS 2.2 release. Updated functional description in chapter 1 and 4.1.2.1 Updated software version from 2.0.634.0 to 2.2.30.0.

3.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. The reader should have a basic understanding of DICOM.

3.3 Remarks

If another device matches this conformance statement based on the comparison with its own conformance statement, there is a chance, but no guarantee, that they interoperate. DICOM deals only with communication; it does not specify what is needed for certain applications to run on a device.

3.4 Definitions and Terms

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax

The information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class.

Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE)

An end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title

The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.

Application Context

The specification of the type of communication used between Application Entities.

Example: DICOM network protocol.

Association

A network communication channel set up between Application Entities.

Attribute

A unit of information in an object definition; a data element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower level data elements.

Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD)

The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).

Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG)

Set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile

The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

Module

Set of Attributes within an Information Object Definition that are logically related to each other.

Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation

First phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context

The set of DICOM network services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.

Protocol Data Unit (PDU)

A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Query Key

Input value for a query process. Query Keys denote the set of DICOM tags that are sent from the SCU to SCP and thus control the query result.

Security Profile

A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data

Service Class Provider (SCP)

Role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User).

Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU)

Role of an Application Entity that uses a DICOM network service; typically, a client.

Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)

Service/Object Pair (SOP) Class

The specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification.

Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance

An information object; a specific occurrence of information exchanged in a SOP Class.

Examples: a specific x-ray image.

Tag

A 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the “group” and the “element”. If the “group” number is odd, the tag is for a private (manufacturer-specific) data element.

Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax

The encoding used for exchange of DICOM information objects and messages.

Examples: JPEG compressed (images), little endian explicit value representation.

Unique Identifier (UID)

a globally unique “dotted decimal” string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier.

Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR)

The format type of an individual DICOM data element, such as text, an integer, a person’s name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5 Abbreviations

Table 3-1 Abbreviations used in this document

Abbreviation	Definition
ANAP	Attribute is not always present - applicable for type 3 attributes
AE	Application Entity
AET	Application Entity Title
APP	Application
AUTO	Automatically generated, cannot be modified by the operator
BRQ	Broad Query mode of Modality Worklist Query
CONFIG	Configurable parameter
CZM	Carl Zeiss Meditec
DEF	Default Value
DICOM	Digital Imaging and Communications in Medicine
ELE	Explicit Little Endian
ILE	Implicit Little Endian
IM	Information Model
IOD	Information Object Definition
JPG-1	JPEG Coding Process 1 transfer syntax; JPEG Baseline; ISO 10918-1
JPG-LL	JPEG Lossless
J2K	JPEG 2000 Image Compression
J2K-LL	JPEG 2000 Image Compression (Lossless Only)

RLE-LL	Run Length Encoding Lossless
MWL	Modality Worklist
MPG2	Motion Picture Expert Group 2; Abbreviation and synonym for video encoding and compression transfer syntax.
MPG2 – ML	MPEG2 Main Profile @ Main Level
MPG2 – HL	MPEG2 Main Profile @ High Level
OD	Oculus Dexter, the right eye
OS	Oculus Sinister, the left eye
OU	Oculus Uterque, both eyes
PBQ	Patient Based Query mode of Modality Worklist Query
PL	Pick list
PLD	Pick list item details
PRQ	Patient Root Query
RNG	Range of values
SCP	Service Class Provider
SCU	Service Class User
SEL	Selection from a list of values
SOP	Service Object Pair, union of a specific DICOM service and related IOD.
SRQ	Study Root Query
TCP/IP	Transmission Control Protocol / Internet Protocol
UID	Unique Identifier
USER	User input
VNAP	Value not always present (attribute sent zero length if no value is present) - applicable for type 2 and 2C attributes

3.6 References

NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at <http://medical.nema.org/>)

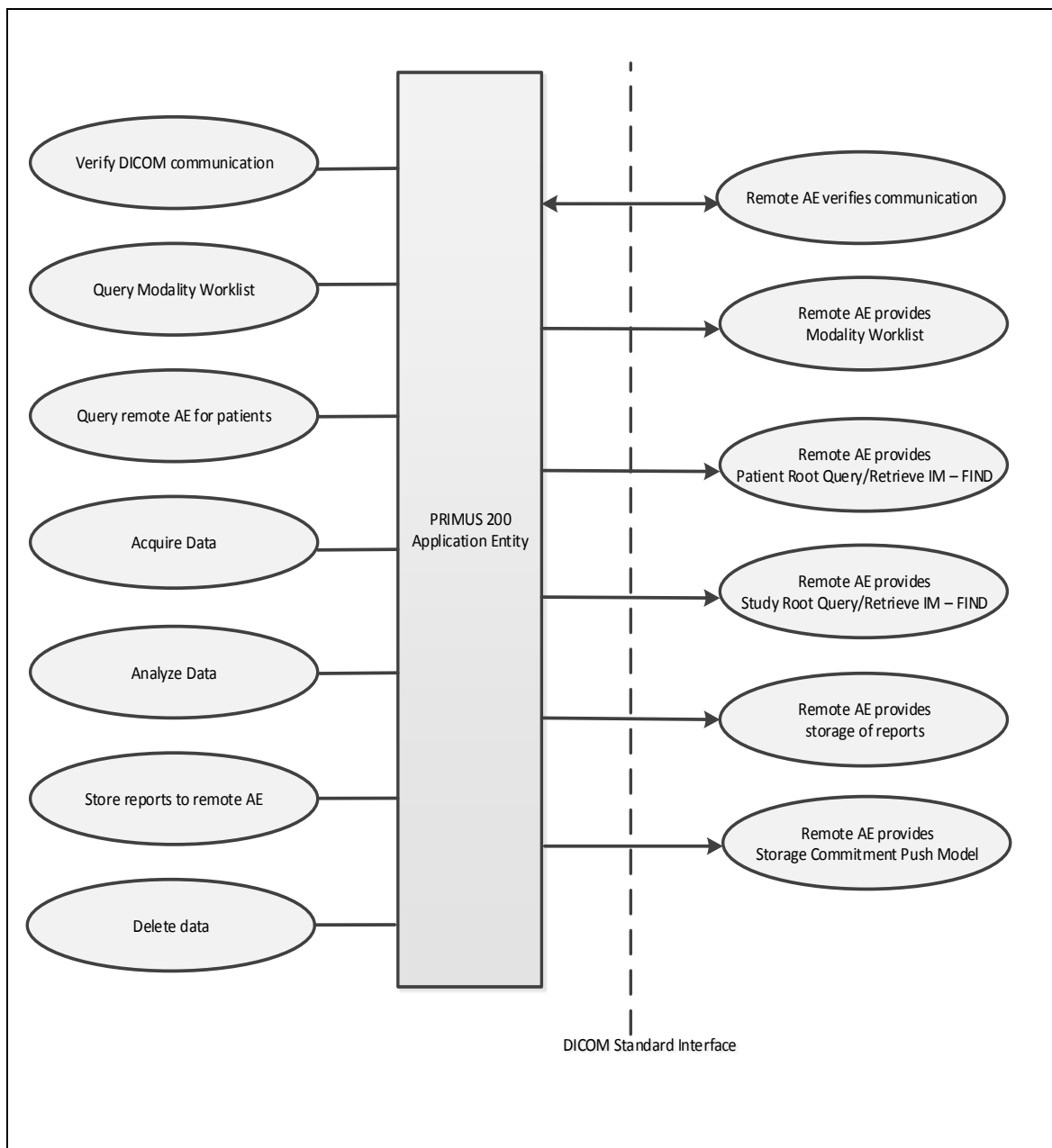
Integrating the Healthcare Enterprise (IHE) EYECARE Technical Framework, rev 3.7, 2010 (available free at http://www.ihe.net/Technical_Framework/index.cfm)

4 Networking

4.1 Implementation Model

4.1.1 Application Data Flow

Figure 4-1 PRIMUS 200 Application Software as Acquisition Modality



4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of PRIMUS 200

The PRIMUS 200 instrument is used for in-vivo viewing of axial cross sections of anterior & posterior ocular structures and measurement of posterior ocular structures.

The PRIMUS 200 instrument is a non-contact, high resolution tomographic and biomicroscopic imaging device. It is indicated for in-vivo viewing, axial cross-sectional imaging and measurement of posterior ocular structures, including retina, retinal nerve fiber layer, macula, and optic nerve head as well as imaging of anterior ocular structures, including the cornea.

It is intended for use as a diagnostic device to aid in the detection and management of ocular diseases including, but not limited to, macular holes, cystoid macular edema, diabetic retinopathy, age-related macular degeneration, and glaucoma.

PRIMUS 200 implements one single DICOM Application Entity which allows to:

- query modality worklist
- query for patients
- archive evidence reports

PRIMUS 200 implements a Service Class User (SCU) for the following DICOM Services:

- Verification
- Modality Worklist Information Model – FIND
- Patient Root Query/Retrieve Information Model – FIND
- Study Root Query/Retrieve Information Model - FIND
- Encapsulated PDF Storage
- Storage Commitment Push Model

PRIMUS 200 implements a Service Class Provider (SCP) for the following DICOM Services:

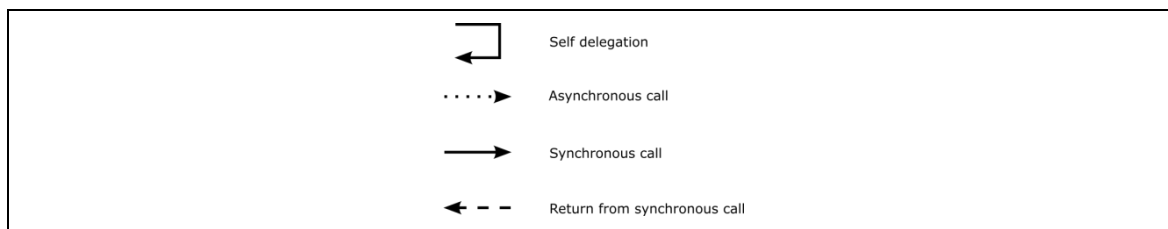
- Verification

The PRIMUS 200 application software allows performing a verification of the configured AEs. The result of this verification contains information about the supported SOP Classes and Transfer Syntaxes of the remote AEs.

The PRIMUS 200 software logs extensive information about the DICOM operations to its log file.

4.1.3 Sequencing of Real-World Activities

To realize the real world activities, the different entities work together. The sequence diagrams shall depict the intended workflow.



The diagrams use slightly modified UML symbols. The asynchronous call is not depicted as suggested in UML. Some objects do have more than one dashed line. It symbolizes more than one thread.

4.1.3.1 Acquisition Modality activities

Query Modality Worklist

When the patient arrives at the PRMIUS 200, the operator queries the worklist. The user can invoke this by refreshing the Today's patient list in the main view which lists all patients scheduled for today for this instrument (identified by the instrument's AE Title and Scheduled procedure step start date from today). For more specific worklist queries the "Advanced" and then "Scheduled Patients" tab can be used.

In either way the operator can select a patient from the result list and furthermore select a requested procedure to proceed with data acquisition.

Query remote AE for patients

When the patient arrives at the PRIMUS 200, the operator can search patients from a remote AE. This can be done by using the "Quicksearch" in the main screen or by using "Advanced" and then the "All Patients" tab for a more detailed search. Any matching results will be listed in the patient list.

This activity generates an unscheduled case.

Afterwards the operator can select the patient for data acquisition or analysis.

Acquire data

When a patient or worklist item is selected the operator selects a scan acquisition protocol and then performs the scan on patient's eye. The Application Software allows the user to review the acquired scan data before permanently saving the scan result.

This activity creates scan data.

Analyze data

Analysis of acquired scan data can be initiated either from the review screen of acquisition or by selecting the exam from Today's/Previous reports in main view.

Store reports to remote AE

This activity is triggered manually by the operator from the analysis view. During this activity, evidence reports are transferred to the configured Storage Provider.

After a configurable amount of time, the Application Software asks the configured Storage Commitment Provider to take over responsibility on data persistence for the data previously transferred by the "Store reports to remote AE" activity. The storage committed instances will be removed from the modality once the exam cache time is over. This is a background activity. This will be done in the shutdown routine.

Delete data from local AE

Automatic invocation:

When connected to a DICOM network, the activity "Delete data" is triggered automatically by application software.

Automatically triggered deletion is done during the shutdown process and will be performed for any instance where the storage to a remote AE is successfully completed and committed. Storage committed instance will be considered for deletion only if the instance is older than exam cache time.

When connected to a DICOM network, a patient will not be removed from the modality until the storage of all related instances to a remote AE is successfully completed and committed.

Furthermore the software application provides configurable options for automatic deletion of data in case of certain error conditions.

Note: Manual invocation of patient deletion is possible only in standalone mode. In standalone mode, operator can delete a patient from the device. Deletion of a patient will delete all the associated exam data of that patient.

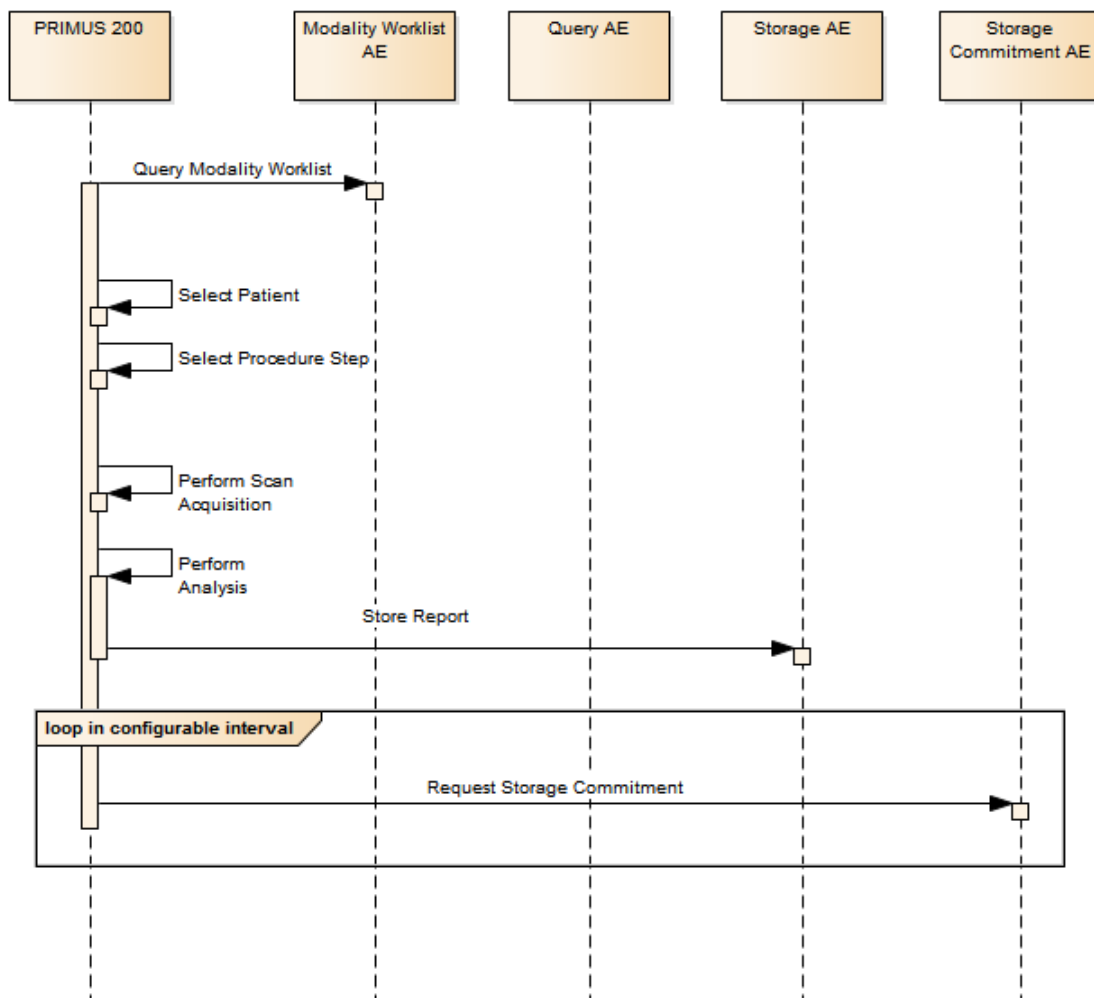
4.1.3.2 Scheduled case with Acquisition Modality

The normal case is that the patient arrives at the front desk. There could be two possibilities at this point:

- The examination can be scheduled for the instrument.
- The examination was scheduled in advance.

In either case all patient and study related information is available at the day the examination takes place. On the PRIMUS 200 these patients appear in the “Today’s” list in the main screen. This information is used to take the examination.

Figure 4-2 Scheduled Case

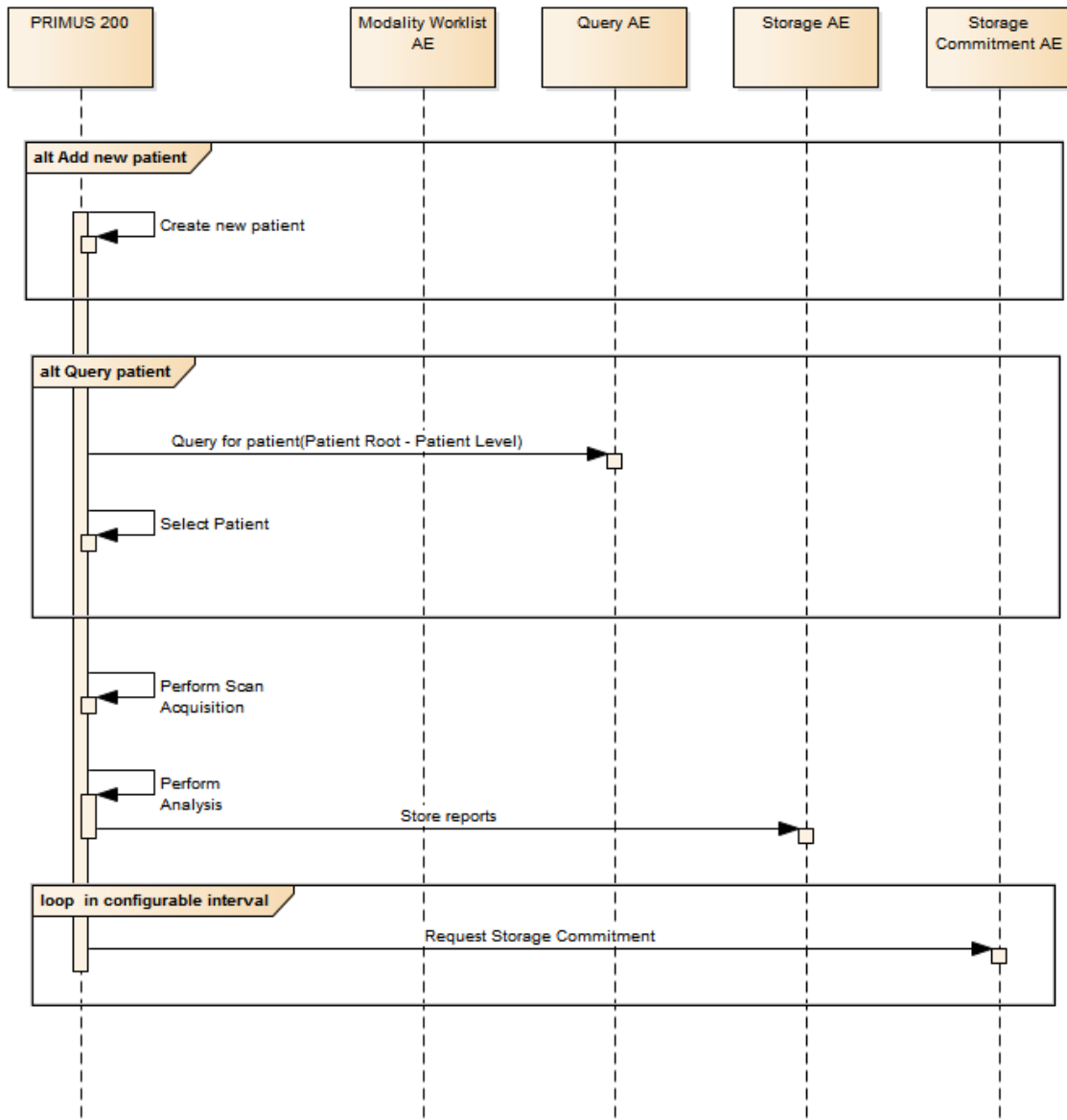


4.1.3.3 Unscheduled case

In the unscheduled case the patient arrives immediately at the instrument, so that the patient was not registered at the front desk or the software does not support DICOM Modality Worklist. Thus the examination is not scheduled in the Modality Worklist. Patient demographics and study specific information has to be generated at the instrument itself. The situation is akin to the case if the Modality Worklist AE could not be reached due to network issues.

Patient demographics can be queried from the Query Service Class Provider. However, this should be considered as an exceptional way to obtain patient demographics.

Figure 4-3 Unscheduled Case



4.2 AE Specifications

4.2.1 PRIMUS 200 AE Specification

4.2.1.1 SOP Classes

Table 4-1 SOP Classes for PRIMUS 200 AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	No
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No See Note 1
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No

Note 1: The networking interface proposes more presentation contexts than actually supported by the application. Lines in grey are not supported by the PRIMUS 200.

4.2.1.2 Associations Policies

4.2.1.2.1 General

The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Table 4-2 DICOM Application Context

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

4.2.1.2.2 Number of Associations

The number of simultaneous associations depends on the usage profile. At a certain point of time there might be active simultaneously:

- 1 association for Verification
- 1 association for Storage
- 1 association for Storage Commitment
- n associations for Modality Worklist - FIND, depending on whether search criteria are changed while a previous query is still active (no response yet)
- n associations for Query/Retrieve - FIND, depending on whether search criteria are changed while a previous query is still active (no response yet)

Table 4-3 Number of associations

Maximum number of simultaneous associations	50
---	----

4.2.1.2.3 Asynchronous Nature

PRIMUS 200 Application Software does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.1.2.4 Implementation Identifying Information

Table 4-4 DICOM implementation class and version

Implementation Class UID	1.2.276.0.75.2.5.20
Implementation Version Name	NIM-2.8.0

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Verify Communication

4.2.1.3.1.1 Description and Sequencing of Activities

This activity is available during the configuration phase. It facilitates the setup and management of the DICOM Application Entities.

The user can test the application level communication between instrument's software Application Entity and its peer DICOM Application Entities. During one test call, all peer DICOM Application Entities are contacted.

In the association request PRIMUS 200 Application Software proposes not only Verification SOP Class, but also all other SOP Classes as supported by the instrument's DICOM interface.

The association is established when the peer DICOM entity accepts the verification related presentation context. In a sub-subsequent step a C-ECHO message is exchanged.

The results of the "Verify Communication" activity are shown to the user as success or failure. For e. g. a Storage Provider not only the Verification information is evaluated, but also the acceptance of the proposed presentation context comprising the respective Storage SOP Classes.

4.2.1.3.1.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

- Verification with Transfer Syntax ILE as SCU

Table 4-5 Presentation Contexts proposed by the PRIMUS 200 AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		
Verification	1.1	ILE	1.2	BOTH	No
Storage Commitment Push Model	1.20.1	ILE	1.2	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve IM – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - MOVE	5.1.4.1.2.2.2	ILE	1.2	SCU	No See Note 2
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: C-FIND extended negotiation is offered. Relational-query support is required by the SCP.

Note 2: The networking interface proposes more presentation contexts than actually supported by the application. All lines in grey are not supported by the PRIMUS 200.

4.2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

The PRIMUS 200 Application Software provides standard conformance.

4.2.1.3.2 Activity – Query Modality Worklist

The worklist contains scheduling information for patients. Query Modality Worklist is used to search for the right scheduling information for this instrument. An operator has two options to perform this activity.

4.2.1.3.2.1 Description and Sequencing of Activities

Option “Today’s Patients query”

In this case, the Application Software performs a query with predefined query keys.

The operator cannot change the query key values. The applied query keys are:

Table 4-6 Modality Worklist Query for Today's Patients

Tag	Attribute Name	Description
(0040,0100)	Scheduled Procedure Step Sequence	
>(0040,0001)	Scheduled Station Application Entity Title	Uses the value as configured for the PRIMUS 200instrument.
>(0040,0002)	Scheduled procedure Step Start Date	Uses the date of today.

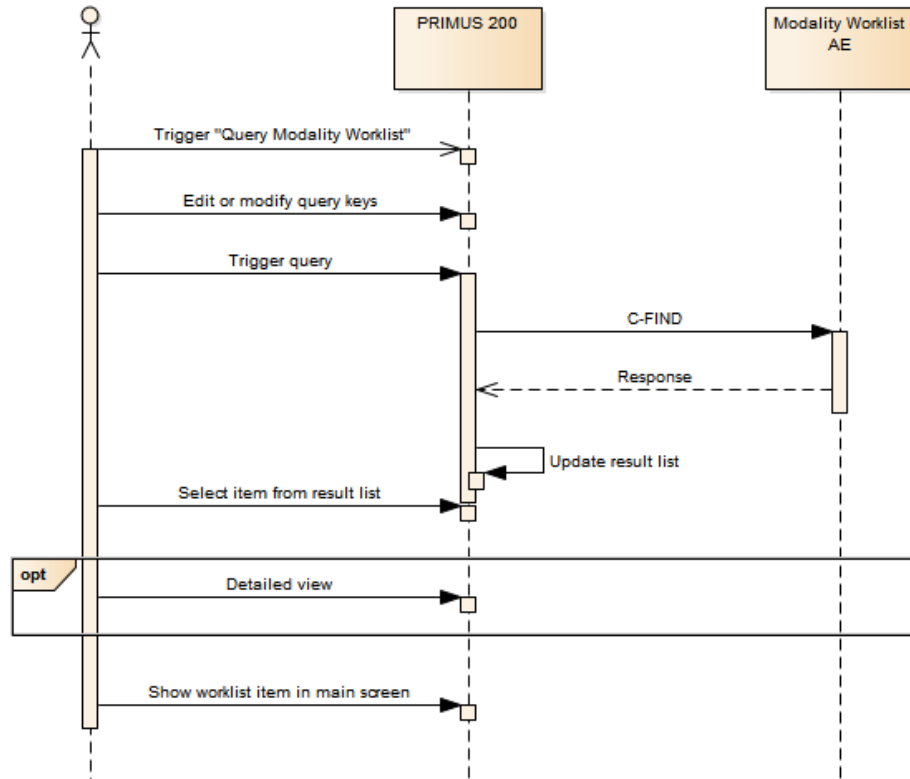
All matching worklist items are subject to be imported into the local database.

This default query can be manually triggered by simply pressing the refresh button in the header of the “Today” list. This default query is also triggered automatically in a configurable interval to keep the "Today" List up to date.

Option “Interactive query”

The query keys of the “Interactive query” can be modified by the operator. To modify the query key the operator has to use “Advanced” in the main screen and use the tab “Scheduled Patients”. This screen will provide all available search fields for the Modality Worklist search.

Figure 4-4 Interactive Query



Trigger “Query Modality Worklist”

The activity “Query Modality Worklist” can be triggered by operator at any time if no other activity is in progress. To invoke the query the operator has to use “Advanced” in the main screen and use the tab “Scheduled Patients”. It is meaningful to perform the query when the patient arrives at the modality. Then the worklist contains latest information.

Edit or modify query keys

The Modality Worklist query offers a GUI for interactive query. The “Station” is prefilled with the instrument AE title and the “Schedule date” is predefined with today. All predefined values can be changed. The operator can change or fill in search criteria in the shown dialog. For instance, the incomplete patient name or the patient ID can be used.

Trigger query

The operator triggers the search after he filled in search criteria. The Application Software sends a DICOM C-FIND request, which contains the search criteria. The Application Software waits for the response from the partner Application Entity. Application Software will accept up to a configurable number of matches. The Application Software checks whether the number of received worklist items overstepped the configurable limit. If the number of received worklist items overstepped the limit, then the Application Software sends a C-CANCEL-RQ, then an

A-RELEASE-RQ to the service provider and a message is displayed. Despite this warning, the operator gets result in the result-list.

After receiving the response, the pick-list is updated. The result-list provides the most important information for a quick overview (see section 4.2.1.3.2.3 for the supported set of tags).

The operator can start over, redefine query keys and trigger the query again. This can be performed as often as required, until he or she finds the correct worklist item.

Select item in result-list

The operator can select one worklist item in the pick-list. The selected item becomes subject for a detailed view that can be imported into the Application Software.

Activate detailed view

The detailed view allows a closer look to the currently selected worklist item. Thus the operator can see more information about patient information and schedule information.

Show worklist item in main screen

The operator can take over the selected item at any time. Once the patient is selected for examination, all associated worklist items of that patient will be listed on a drop down list in the detailed patient information view. Operator can choose the work item from this list and continue with scan acquisition. The Application persist worklist item until instance is stored successfully.

4.2.1.3.2.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

- "Modality Worklist IM - FIND" with Transfer Syntax ILE as SCU

Table 4-7 Proposed Presentation Contexts by the PRIMUS 200 AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		
Verification	1.1	ILE	1.2	BOTH	No
Storage Commitment Push Model	1.20.1	ILE	1.2	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve IM – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - MOVE	5.1.4.1.2.2.2	ILE	1.2	SCU	No See Note 2
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: C-FIND extended negotiation is offered. Relational-query support is required by the SCP.

Note 2: The networking interface proposes more presentation contexts than actually supported by the application. All lines in grey are not supported by the PRIMUS 200.

4.2.1.3.2.3

SOP Specific Conformance for Modality Worklist SOP Class

Table 4-8 Modality Worklist C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Failure	Refused: Out of Resources	A700	Log message and display user alert message.
Failure	Identifier Does Not Match SOP Class	A900	Log message and display user alert message.
Failure	Unable to process	C000-CFFF	Log message and display user alert message.
Failure	Refused: SOP class not supported	0122	Log message and display user alert message.
Cancel	Matching terminated due to Cancel request	FE00	Log message
Success	Matching is complete	0000	The Software Application stops receiving worklist items. It finally updates the pick list.
Pending	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Log message. The Application Software checks whether the number of received worklist items overstepped the configurable limit. If the number of received worklist items overstepped the limit, then the Application Software sends a C-CANCEL-RQ, then an A-RELEASE-RQ to the service provider and a message is displayed.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and / or matching for this Identifier	FF01	Log message. The Application Software checks whether the number of received worklist items overstepped the configurable limit. If the number of received worklist items overstepped the limit, then the Application Software sends a C-CANCEL-RQ, then an A-RELEASE-RQ to the service provider and a message is displayed.
Unknown	All other responses with unknown code meaning	xxxx	Log message and display user alert message

Table 4-9 Attributes involved in Modality Worklist C-FIND request and response

Tag	Tag Name	Query Key	Imported	Displayed	Modifiable	SOP Instance
Scheduled Procedure Step (SPS)						
(0040,0100)	Scheduled Procedure Step Sequence					
>(0040,0001)	Scheduled Station Application Entity Title	BRQ,DEF	X	PLD		X
>(0040,0003)	Scheduled Procedure Step Start Time		X	PLD		X
>(0040,0002)	Scheduled Procedure Step Start Date	BRQ, DEF	X	PLD		X
>(0008,0060)	Modality	BRQ	X	PLD		X
>(0040,0006)	Scheduled Performing Physicians Name					
>(0040,0007)	Scheduled Procedure Step Description		X	PLD		X
>(0040,0010)	Scheduled Station Name					
>(0040,0011)	Scheduled Procedure Step Location					
>(0040,0008)	Scheduled Protocol Code Sequence		X			X
>>(0008,0100)	Code Value		X			X
>>(0008,0102)	Coding Scheme Designator		X			X
>>(0008,0103)	Coding Scheme Version		X			X
>>(0008,0104)	Code Meaning		X	PLD		X
>(0040,0012)	Pre-Medication					
>(0040,0009)	Scheduled Procedure Step ID		X			X
>(0032,1070)	Requested Contrast Agent					
Requested Procedure						
(0040,1001)	Requested Procedure ID	PBQ	X	PLD		X
(0032,1060)	Requested Procedure Description		X	PLD		X
(0032,1064)	Requested Procedure Code Sequence		X			X
>(0008,0100)	Code Value		X			X
>(0008,0102)	Coding Scheme Designator		X			X
>(0008,0103)	Coding Scheme Version		X			X
>(0008,0104)	Code Meaning		X	PLD		X
(0020,000D)	Study Instance UID		X			X
(0008,1110)	Referenced Study Sequence		X			X
>(0008,1150)	Referenced SOP Class UID		X			X
>(0008,1155)	Referenced SOP Instance UID		X			X
(0040,1003)	Requested Procedure Priority					
(0040,1004)	Patient Transport Arrangements					
(0040,1400)	Requested Procedure Comments		X	PLD		X
Imaging Service Request						
(0008,0050)	Accession Number	PBQ	X	PLD		X

(0032,1032)	Requesting Physician		X			X
(0008,0090)	Referring Physicians Name		X	PLD		X
Visit Identification						
(0038,0010)	Admission ID					
Visit Status						
(0038,0300)	Current Patient Location					
Visit Relationship						
(0008,1120)	Referenced Patient Sequence					
>(0008,1150)	Referenced SOP Class UID					
>(0008,1155)	Referenced SOP Instance UID					
Patient Identification						
(0010,0010)	Patients Name ¹	PBQ	X	PL, PLD, APP		X
(0010,0020)	Patients ID	PBQ	X	PL, PLD, APP		X
(0010,0021)	Issuer of Patient ID		X			X
(0010,1000)	Other Patient IDs		X			X
Patient Demographic						
(0010,0030)	Patients Birth Date		X	PL, PLD, APP		X
(0010,0040)	Patients Sex		X	PL, PLD, APP		X
(0010,1030)	Patients Weight					
(0040,3001)	Confidentiality Constraint on Patient Data Description					
(0010,4000)	Patients Comments		X			X
Patient Medical						
(0038,0500)	Patient State					
(0010,21C0)	Pregnancy Status					
(0010,2000)	Medical Alerts					
(0038,0050)	Special Needs					

Note 1: If the multicomponent name representation is enabled then the name components with Priority 1 and Priority 2 are shown in the PL, the name components with Priority 1 is shown in the PLD and the name component what have been entered as query key will be always sent in the Alphabetic group of the C-Find-RQ (see section 4.4.2.1 for the setting of multicomponent group names).

Values of column "Query Key":

PBQ

A tag that is marked with PBQ is used as query key in the Patient Based Query mode of the interactive Modality Worklist Query Dialog.

BRQ

A tag that is marked with BRQ is used as query key in the Broad Query mode of the interactive Modality Worklist Query Dialog.

DEF

A tag that is marked with DEF has a value assigned when the interactive Modality Worklist Query Dialog is shown the first time or when the Reset button is pushed.

Default values can get modified. The modifications will be stored for next use of Modality Worklist Query Dialog.

RNG

The operator can apply a range as value for the query key.

SEL

The operator can select a value from a given list of values.

Values of column “Imported”:**X**

The value gets imported in the application. Thus this value may have influence in Information Objects which will be created as a result of the performed examination.

Values of column “Displayed”:**PL**

Values of this tag are instantly visible in the pick list.

PLD

Values of this tag are visible in the details dialog of the current selected pick list item.

APP

Values of this tag are visible in the application.

Values of column “Modifiable”:**X**

A value which has been imported to the application might be modified inside the application.

Values of column SOP Instance:**X**

Values of marked tags will be stored in created SOP Instances. See section 8.1 “mapping of attributes” in 8.1.3Attribute Mapping.

Following set of tags can be used as query key in the so called “**Patient Based Query**”. The Patient Based Query is a working mode of the Modality Worklist Query Dialog.

Table 4-10 Modality Worklist query key details - Patient Based Query

Tag	Tag Name	Description
(0010,0010)	Patients Name ¹	The PRIMUS 200Application Software supports family name and given name only. A “*” wildcard will automatically added at the end.
(0010,0020)	Patient ID	The operator can enter a string which conforms to the Value Representation LO.
(0008,0050)	Accession Number	The operator can enter a string which conforms to the Value Representation SH.
(0040,1001)	Requested Procedure ID	The operator can enter a string which conforms to the Value Representation SH.

Note 1: If the multicomponent name representation is enabled than the name component what have been entered as query key (Alphabetic, Ideographic or Phonetic) will be always sent in the Alphabetic group of the C-Find-RQ (see section 4.4.2.1 for the setting of multicomponent group names).

Following set of tags can be used as query key in the so called “**Broad Query**”. The Broad Query is a working mode of the Modality Worklist Query Dialog.

Table 4-11 Modality Worklist query key details - Broad Query

Tag	Tag Name	Description
(0040,0100)	Scheduled Procedure Step Sequence	This attribute is the container for the tags as listed below. The sequence contains one item.
>(0040,0002)	Scheduled Procedure Step	The default value is today’s date.

	Start Date	The operator can change the value to tomorrow, week and can even enter date ranges.
>(0008,0060)	Modality	The operator can change the value and select one value of a predefined set of values including an empty string. Possible values are "OAM", "OP", "OPM", "OPT", "OPV", "IOL".
>(0040,0001)	Scheduled Station AE Title	The default value is set by configuration. The operator can enter the AE Title of another device or leave the field empty.

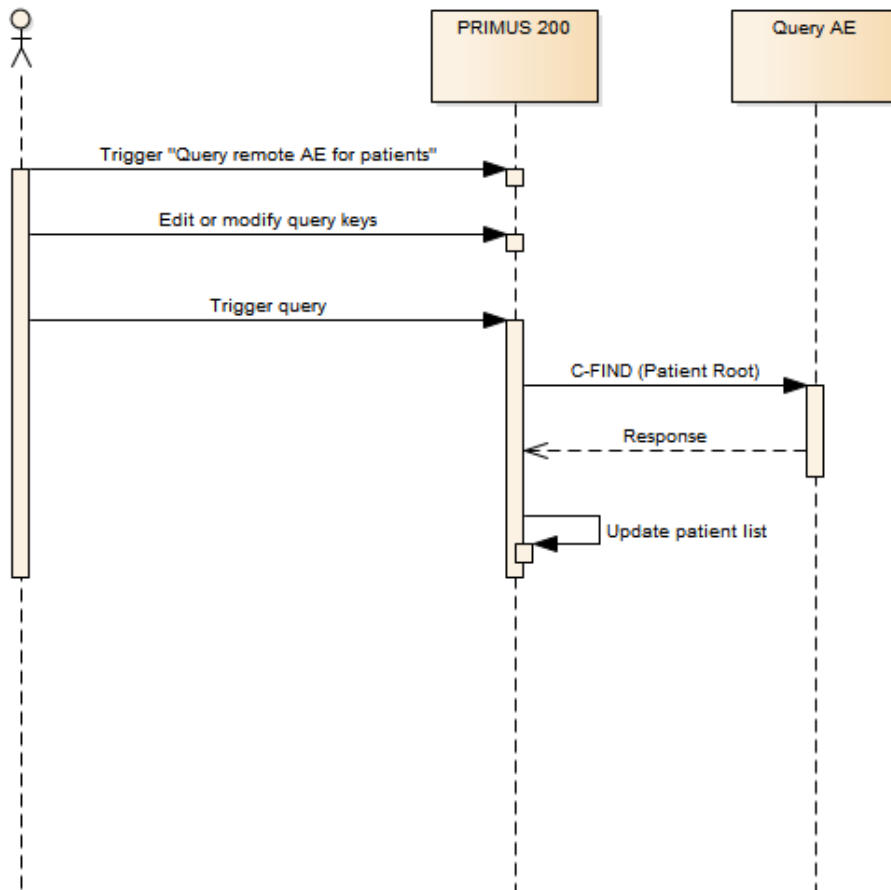
4.2.1.3.3 Activity - Query remote AE for patients

Query is used to get patient information on a DICOM server.

4.2.1.3.3.1 Description and Sequencing of Activities

There are two ways for the user to trigger a query request. The "Quick Search" in the main screen will search in "Patient Given Name", "Patient Last Name", "Patient ID" and "Patient Birth Date" in parallel. The second way is the "Advanced" search. The user can select this search by clicking the "Advanced" button in the main screen.

Figure 4-5 Query for patients



Trigger “Query remote AE for patients”

The activity “Query remote AE for patients” can be triggered by the operator by using the “Quicksearch” or change to the “Advanced” screen.

Edit or modify query keys

The “Advanced” screen offers a GUI for interactive query. The operator can change or fill in search criteria in the shown search fields.

The top-most search field in the main screen is the “Quicksearch” field. Any value entered here is applied to

- (0010,0010) Patient’s Name – Family Name
- (0010,0010) Patient’s Name – Given Name
- (0010,0020) Patient ID
- (0010,0030) Patient’s Birth Date (only if the value entered is a date, date format depends on the locale settings configuration)

and issued as four separate requests. The entered value has automatically a trailing wildcard to fulfill the ‘contains’ condition.

For more details on supported query keys see Table 4-18 Query key details.

Trigger query

The operator triggers the search after he or she filled in search criteria by either pressing the “Enter” key or click on the “Search button”. The Application Software sends a Patient Root based DICOM C-FIND request which contains the entered

search criteria. The Application Software waits for the response from the Query AE and accepts up to a configurable number of matches. If the number of matches exceeds this limit, the Application Software shows information about truncated search results and a request to apply more specific query keys. Despite this warning, the operator gets results in the pick-list.

After receiving the response, the patient pick-list is updated. The patient pick-list provides the most important information for a quick overview.

The operator can start over, redefine query keys and trigger the query again. This can be performed as often as required, until he or she finds the correct patient entry.

Important note: For this activity it is required that the SCP supports the Relational query model since Application Software does not use the Hierarchical model.

4.2.1.3.3.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

- "Patient Root Query/Retrieve Information Model - FIND" with Transfer Syntax ILE as SCU
- "Study Root Query/Retrieve Information Model - FIND" with Transfer Syntax ILE as SCU

Important note: For this activity it is required that the SCP supports the Relational query model since Application Software does not use the Hierarchical model.

Table 4-12 Proposed Presentation Contexts by the PRIMUS 200 AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		
Verification	1.1	ILE	1.2	BOTH	No
Storage Commitment Push Model	1.20.1	ILE	1.2	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve IM – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - MOVE	5.1.4.1.2.2.2	ILE	1.2	SCU	No See Note 2
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: C-FIND extended negotiation is offered. Relational-query support is required by the SCP.

Note 2: The networking interface proposes more presentation contexts than actually supported by the application. All lines in grey are not supported by the PRIMUS 200.

4.2.1.3.3.3

SOP Specific Conformance for Patient Root and Study Root Query/Retrieve SOP Class as SCU

Table 4-13 Query C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Failure	Refused: Out of Resources	A700	Log message and display user alert.
Failure	Identifier does not match SOP Class	A900-A9FF	Log message and display user alert.
Failure	Unable to process	C000-CFFF	Log message and display user alert.
Failure	Refused: SOP class not supported	0122	Log message and display user alert
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete – No final Identifier is supplied	0000	The Software Application stops receiving worklist items. It finally updates the pick list.
Pending	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Log message. The Application Software checks whether the number of received worklist items overstepped the configurable limit. If the number of received worklist items overstepped the limit, then the Application Software sends a C-CANCEL-RQ, then an A-RELEASE-RQ to the service provider and a message is displayed.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and / or matching for this Identifier.	FF01	Log message. The Application Software checks whether the number of received worklist items overstepped the configurable limit. If the number of received worklist items overstepped the limit, then the Application Software sends a C-CANCEL-RQ, then an A-RELEASE-RQ to the service provider and a message is displayed.
Unknown	All other responses with unknown code meaning	xxxx	Log message and display user alert

Table 4-14 PATIENT level keys for the Patient Root Query/Retrieve Information Model (request and response)

Tag	Tag Name	Query Key	Imported	Displayed	Modifiable	SOP Instance
(0010,0010)	Patient's Name ¹	X	X	X		
(0010,0020)	Patient ID	X	X	X		

(0010,0021)	Issuer of Patient ID		X			
(0010,0030)	Patient's Birth Date	RNG	X	X		
(0010,0032)	Patient's Birth Time		X			
(0010,0040)	Patient's Sex		X	X		
(0010,1000)	Other Patient IDs		X			
(0010,2160)	Ethnic Group		X			
(0010,4000)	Patient Comments		X			

¹Note: If the multicomponent name representation is enabled then the name components with Priority 1 and Priority 2 are displayed and the name component what have been entered as query key (Alphabetic, Ideographic or Phonetic) will be always sent in the Alphabetic group of the C-Find-RQ (see section 4.4.2.1 for the setting of multicomponent group names).

Table 4-15 STUDY level keys for the Patient Root Query/Retrieve Information Model (request and response)

Tag	Tag Name	Query Key	Imported	Displayed	Modifiable	SOP Instance
(0008,0020)	Study Date					
(0008,0030)	Study Time					
(0008,0050)	Accession Number	X				
(0008,0061)	Modalities in Study					
(0008,0090)	Referring Physician's Name	X				
(0008,0090)	Study Description					
(0008,1080)	Admitting Diagnoses Description					
(0020,0010)	Study ID					
(0020,000D)	Study Instance UID					

Table 4-16 SERIES level keys for the Patient Root Query/Retrieve Information Model (request and response)

Tag	Tag Name	Query Key	Imported	Displayed	Modifiable	SOP Instance
(0008,0021)	Series Date					
(0008,0031)	Series Time					
(0008,0060)	Modality	SEL				
(0008,103E)	Series Description					
(0008,1050)	Performing Physician's Name					
(0008,1090)	Manufacturer's Model Name					
(0020,000E)	Series Instance UID					
(0020,0011)	Series Number					

(0020,0060)	Laterality					
(0040,0244)	Performed Procedure Step Start Date					
(0040,0245)	Performed Procedure Step Start Time					
(0040,0275)	Request Attributes Sequence					

Table 4-17IMAGE level keys for the Patient Root Query/Retrieve Information Model (request and response)

Tag	Tag Name	Query Key	Imported	Displayed	Modifiable	SOP Instance
(0008,0008)	Image Type					
(0008,0012)	Instance Creation Date					
(0008,0013)	Instance Creation Time					
(0008,0016)	SOP Class UID					
(0008,0018)	SOP Instance UID					
(0008,002A)	Acquisition DateTime	RNG				
(0008,114A)	Referenced Instance Sequence					
>(0008,1150)	Referenced SOP Class UID					
>(0008,1155)	Referenced SOP Instance UID					
(0020,0013)	Instance Number					
(0020,0062)	Image Laterality					

Values of column “Query Key”:

RNG

The operator can apply a range as value for the query key.

SEL

The operator can select a value from a given list of values.

X

The value is included in the query request if not empty.

AUTO

The value cannot be modified by the operator.

Values of column “Imported”:

X

The value gets imported in the application. Thus this value may have influence in Information Objects which will be created as a result of the performed examination.

Values of column “Displayed”:

X

Values of this tag are instantly visible in the pick list.

Values of column “Modifiable”:**X**

A value which has been imported to the application might be modified inside the application.

Values of column SOP Instance:**X**

Values of marked tags will be stored in created SOP Instances. See section “mapping of attributes” in 8.1.3Attribute Mapping.

Table 4-18 Query key details

Tag	Tag Name	Description
(0010,0010)	Patient's Name ¹	The default value is empty string. Only family name and given name can be used as query keys. The operator can use '*' or '?' as wild cards. This is a DICOM Standard query key on Patient level.
(0010,0020)	Patient ID	The default value is empty string. The operator can enter each value that conforms to the Value Representation LO. This is a DICOM Standard query key on Patient level.
(0010,0030)	Patient's Birth Date	The default value is empty date. The operator can enter a specific value that conforms to the Value Representation DA. The operator can also select from a range of dates. This is a DICOM Optional query key on Patient level, thus the effect of this query key on the query depends on Service Provider implementation.
(0008,0050)	Accession Number	The default value is empty string. The operator can enter each value that conforms to the Value Representation SH. This is a DICOM Standard query key on Study level.
(0008,0090)	Referring Physician's Name ²	The default value is empty string. Only family name can be used as query key. This is a DICOM Optional query key on Study level, thus the effect of this query key on the query depends on Service Provider implementation.
(0008,0060)	Modality	The default value is empty string. The operator can select from a list of pre-defined values and the application software will convert the selection to a value that conforms to the Value Representation CS. This is a DICOM Standard query key on Series level.

Note 1: If the multicomponent name representation is enabled then the name component what have been entered as query key (Alphabetic, Ideographic or Phonetic) will be always sent in the Alphabetic group of the C-Find-RQ (see section 4.4.2.1 for the setting of multicomponent group names).

Note 2: Only Alphabetic part of the multicomponent group name is used as query key

4.2.1.3.4 Activity – Acquire data

Once the patient is selected for examination, operator can choose a scan acquisition protocol and perform 'Acquire'. This activity has no direct relation to DICOM messaging.

During this activity, the Application Software creates scan data and stores it locally.

4.2.1.3.5 Activity – Analyze data

Analysis of acquired scan data can be initiated either from the review screen of acquisition or by selecting the exam from Today's/Previous reports in main view.

This activity has no direct relation to DICOM messaging.

4.2.1.3.6 Activity – Store reports to remote AE

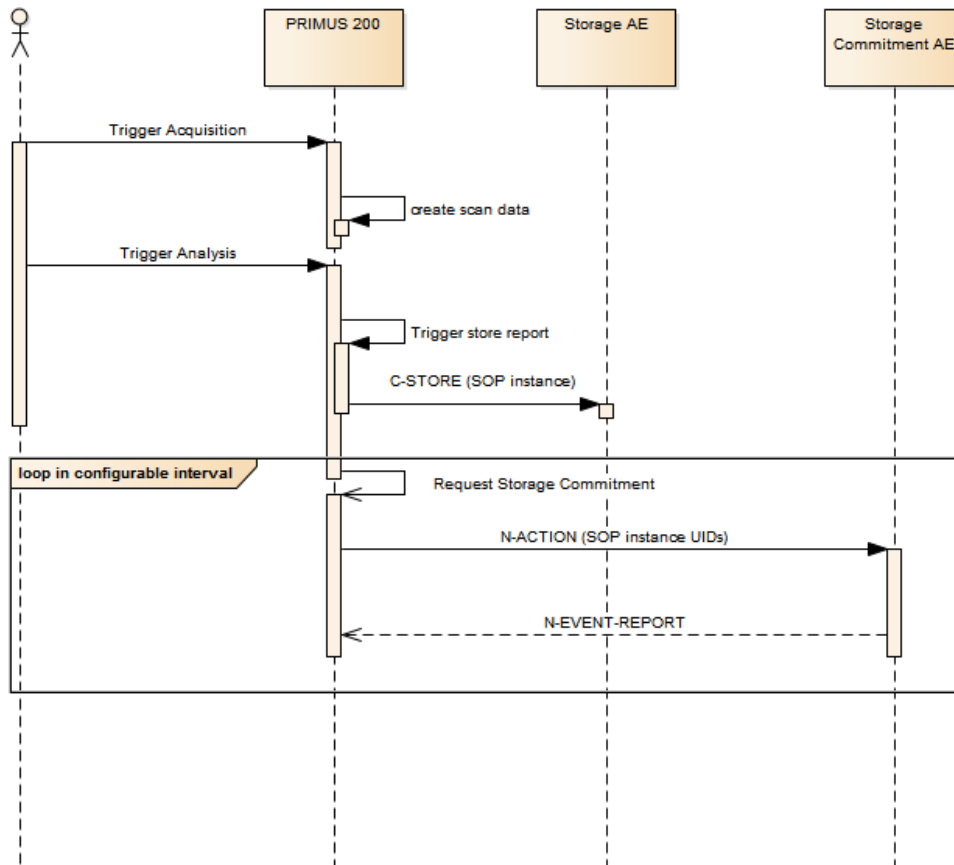
This activity is triggered manually by the operator from the analysis view. During this activity, evidence reports are transferred to the configured Storage Provider.

Note: Currently, PRIMUS 200 application software does not support archival of raw data instances. Therefore the acquired scan data and analysis data will remain on the device.

After a configurable amount of time, the Application Software asks the configured Storage Commitment Provider to take over responsibility on data persistence for the data previously transferred by the "Store reports to remote AE" activity. The storage committed instances will be removed from the modality. This is a background activity. This will be done in the shutdown routine.

4.2.1.3.6.1 Description and Sequencing of Activities

Figure 4-6 Archive data



Trigger “storage”

This activity is triggered manually by the operator from the analysis view by clicking “Export to Dicom” button.

Request Storage Commitment

To verify that the data has been safely archived, the Application Software can be set up to request the configured Storage Commitment AE in a configurable interval to commit the storage of instances.

Data that has been successfully archived (stored and successfully committed) might be subject to be deleted at shutdown after a configurable caching time.

4.2.1.3.6.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

- Encapsulated PDF with Transfer Syntax ELE (Transfer Syntax ILE as fallback) as SCU
- Storage Commitment Push Model with Transfer Syntax ILE as SCU

Table 4-19 Presentation Contexts proposed by PRIMUS 200 AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		

Verification	1.1	ILE	1.2	BOTH	No
Storage Commitment Push Model	1.20.1	ILE	1.2	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve IM – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	Yes See Note 1
Study Root Query/Retrieve IM - MOVE	5.1.4.1.2.2.2	ILE	1.2	SCU	No See Note 2
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: C-FIND extended negotiation is offered. Relational-query support is required by the SCP.

Note 2: The networking interface proposes more presentation contexts than actually supported by the application. All lines in grey are not supported by the PRIMUS 200.

4.2.1.3.6.3 SOP Specific Conformance for Storage SOP Classes

Table 4-20 Storage C-STORE Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Failure	Refused: Out of Resources	A700-A7FF	Log message and retry c-store. If error persists then message to user.
Failure	Error: Data Set does not match SOP Class	A900-AFF	Log message and do not retry. Message to user.
Failure	Error: Cannot understand	C000-CFFF	Log message and do not retry. Message to user.
Failure	Refused: SOP class not supported	0122	Log message and show user alert.
Warning	Coercion of data Elements	B000	The Application Software logs this event.
Warning	Data Set does not match SOP Class	B007	The Application Software logs this event.
Warning	Elements Discarded	B006	The Application Software logs this event.
Success	Successful Storage	0000	Message to user.
Unknown	All other responses with unknown code	xxxx	Log message and do not retry. Message to user.

4.2.1.3.6.4 SOP Specific Conformance for Storage Commitment SOP Class

4.2.1.3.6.4.1 Storage Commitment Operations (N-ACTION)

The Application Software will request storage commitment for instances of Encapsulated PDF Image Storage if the Remote AE is configured as Storage Commitment Provider and a presentation context for the Storage Commitment Push Model has been accepted.

The Storage Commitment Request addresses at least one SOP Instance and at maximum 500 SOP instances.

The behavior of the Application Software when encountering status codes in an N-ACTION response is summarized in the table below:

Table 4-21 Storage Commitment N-ACTION Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Failure	Class-instance conflict	0119	Log message and display user alert.
Failure	Duplicate invocation	0210	Log message.
Failure	Invalid argument value	0115	Log message and display user alert.
Failure	Invalid SOP Instance	0117	Log message and display user alert.
Failure	Mistyped argument	0212	Log message and display user alert.
Failure	No such action	0123	Log message and display user alert.
Failure	No such argument	0114	Log message and display user alert.
Failure	No such SOP class	0118	Log message and display user alert.
Failure	No such SOP Instance	0112	Log message.
Failure	Processing failure	0110	Log message and display user alert.
Failure	Resource limitation	0213	Log message.
Failure	Unrecognized operation	0211	Log message and display user alert.
Success	Success	0000	The Application Software will wait for an incoming N-EVENT-REPORT.
Unknown	All other responses with unknown code meaning.	xxxx	Log message and display user alert.

4.2.1.3.6.4.2 Storage Commitment Communication Failure Behaviour

If the Application Software runs in a timeout or if the association is aborted by the provider or network layer, or if waiting duration for Storage Commitment N-EVENT-REPORT oversteps a configurable time limit then the related SOP Instance is considered as not being committed. Then the SOP Instance is subject of a future Storage Commitment service call. It will be included again within next call of this activity.

In addition to that, the Application Software writes the SOP Instance UID to the log file, together with the failure reason.

4.2.1.3.7 Activity – Delete data

Automatic invocation:

When connected to a DICOM network, the activity "Delete data" is triggered automatically by application software.

Automatically triggered deletion is done during the shutdown process and will be performed for any instance where the storage to a remote AE is successfully completed and committed.

When connected to a DICOM network, a patient will not be removed from the modality until the storage of all related instances to a remote AE is successfully completed and committed.

Note: Manual invocation of patient deletion is possible only in standalone mode. In standalone mode, operator can delete a patient from the device. Deletion of a patient will delete all the associated exam data of that patient.

Furthermore the software application provides configurable options for automatic deletion of data in case of certain error conditions:

Delete Exam when "Instance not found": When configured with Delete Exam, the affected instance that cannot be found anymore on the remote AE is flagged for deletion as soon as the Storage Commitment report contains a failure reason "instance not found" for this particular instance. The deletion of the instance happens on next shutdown.

Re-Archive when "Instance not found": When configured with Re-Archive, the affected instance is re-archived immediately when storage commitment reports a failure reason "Instance not found". New Storage Commitment will be requested in a future Storage Commitment call. In case the new Storage Commitment fails again it will be retried until the maximum number of retries (3 Storage Commitment calls) is reached.

Delete when "Failed Instances": When the user hits the Delete Button all instances which are in Storage Commitment error status (any error or failure reason other than "Instance not found") will be marked for deletion when the maximum number of retries (3 Storage Commitment calls) is reached. Deletion happens on next shutdown.

Reset when "Failed Instances": When the user hits the Reset Button all instances which are in Storage Commitment error status (any error or failure reason other than "Instance not found") will be marked as already archived, but not storage committed.

The status for these instances will be reset as if no storage commitment has been ever requested before. In a future Storage Commitment call the Application Software will request again storage commitment for these particular instances and retries any future failed storage commitment until the maximum number of retries (3 Storage Commitment calls) is reached.

4.2.1.4 Association Acceptance Policy

4.2.1.4.1 Activity – Verify Communication

The activity can be performed at any time. The service is available as soon as the Application Software has been started.

4.2.1.4.1.1 Description and Sequencing of Activities

The Software AE responds to verification requests made by remote AEs.

4.2.1.4.1.2 Accepted Presentation Contexts

Table 4-22 Presentation Context accepted by the PRIMUS 200 AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		
Verification	... 1.1	ILE	... 1.2	BOTH	No

4.2.1.4.1.3 SOP Specific Conformance for Verification SOP Class as SCP

The Application Software AE provides standard conformance.

4.2.1.4.2 Activity – Archive data

This chapter describes the aspect of association acceptance of the activity “Store reports to remote AE”. The activity stores evidence reports created at the modality and requests a storage commitment afterwards.

4.2.1.4.2.1 Description and Sequencing of Activities

The description and sequencing of activities is covered by chapter “4.2.1.3.6 Activity – Store reports to remote AE”.

4.2.1.4.2.2 Accepted Presentation Contexts

Table 4-23 Presentation Contexts accepted by the PRIMUS 200 AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		
Verification	1.1	ILE	1.2	BOTH	No
Storage Commitment Push Model	1.20.1	ILE	1.2	SCU	No

4.2.1.4.2.3 SOP Specific Conformance for Storage SOP Class as SCP

The Application Software AE provides standard conformance.

4.2.1.4.2.4 SOP Specific Conformance for Storage Commitment SOP Class

4.2.1.4.2.4.1 Storage Commitment Operations (N-EVENT-REPORT)

The Application Software is capable of receiving an N-EVENT-REPORT notification if it has successfully negotiated a Presentation Context for the Storage Commitment Push

The behavior of Application Software when receiving Event Types within the N-EVENT-REPORT is summarized in the table below.

Table 4-24 Storage Commitment N-EVENT-REPORT Request Failure Reasons

Service Status	Further Meaning	Status Code	Behavior
Failure	Processing Failure	0110	The SOP Instance is also considered as not being committed. For a configurable amount of re-trials the SOP Instance is subject of a future Storage Commitment service request. It will be included again within next call of these activities. In addition, the application software writes the SOP Instance UID to the log file with the failure reason.
Failure	No such object instance	0112	The SOP Instance is also considered as not being committed. The application will repeat the storage or delete the local instance based on a setting (see section 4.4.2.1 General Parameters). The default setting is to re-archive the exam. In addition, the application software writes the SOP Instance UID to the log file with the failure reason.
Failure	Resource limitation	0213	The SOP Instance is also considered as not being committed. For a configurable amount of re-trials the SOP Instance is subject of a future Storage Commitment service request. It will be included again within next call of these activities. In addition, the application software writes the SOP Instance UID to the log file with the failure reason.
Failure	Referenced SOP Class not supported	0122	The application software writes the SOP Instance UID to the log file with the failure reason.
Failure	Class / Instance conflict	0119	The application software writes the SOP Instance UID to the log file with the failure reason.
Failure	Duplicate transaction UID	0131	The SOP Instance is also considered as not being committed. For a configurable amount of re-trials the SOP Instance is subject of a future Storage Commitment service request. It will be included again within next call of these activities. In addition, the application software writes the SOP Instance UID to the log file with the failure reason.
Unknown	All other responses with unknown code meaning	xxxx	Log message and retry storage commit for failed sop instance(s).

If the N-EVENT-REPORT contains failed instances the behavior of the application depends on the failure reason associated with the failed instances (see table above). In general retry means a retry for 2 times, no retry will set the error counter to maximum. A reset of the error counter is possible in the application settings screen.

4.3 Network Interfaces

4.3.1 Physical Network Interface

The physical network interface is not visible for the instrument application. The instrument application uses the communication stack as offered by the Operating System.

4.3.2 Additional Protocols

Both IP addresses and host names are supported and get resolved. Else no additional protocols are supported.

4.3.3 IPv4 and IPv6 Support

The PRIMUS 200 application software supports only IPv4 and does not support IPv6 Addresses.

4.4 Configuration

Local application entity and remote application entity information can be configured in the Networking section of the software application's "Settings" dialog. This dialog does also allow other networking and DICOM related settings like networking timeouts; worklist and patient query item limit parameters. Institution related settings like Institution Name, address etc can be set from the "General" section of the "Settings" dialog.

4.4.1 AE Title/Presentation Address Mapping

The mapping from AE Title to TCP/IP addresses and ports is configurable and set at the time of installation by Installation Personnel.

4.4.1.1 Local AE Titles

The IP can be configured to be set up manually or to be administered by the Operating System. The Application Entity Title as well as the port number is configurable. The default port number is 11112.

4.4.1.2 Remote AE Titles

The mapping of external AE Titles to TCP/IP addresses and ports is configurable. The PRIMUS 200 Application Software allows setting up a remote Application Entity for each service. For all Application Entities, the host name or IP, the Port and the Application Entity Title must be known. Mapping of DICOM services to remote AE can be done either manually or by using the "Auto Connect" feature.

4.4.2 Parameters

4.4.2.1 General Parameters

The general parameters are shared for associations to any of the configured AE.

Table 4-25 Configuration Parameters Table

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
DIMSE RSP Timeout	Yes (10 – 60 sec.)	20 sec
Network Timeout	Yes (5-20 sec.)	20 sec.

Max. Association Idle Time	Yes (10 – 60 sec.)	30 sec
Network log level	Yes	Warning
Storage Commitment for failed instances	Yes	Re-archive
(0008,0080) Institution Name	Yes	EMPTY
(0008,1040) Institutional Department Name	Yes	EMPTY
(0008,0081) Institution Address	Yes	EMPTY
(0008,1010) Station Name	Yes	EMPTY
(0010,0021) Issuer of Patient ID	Yes	PRIMUS 200
Other configurable parameters ?		
AE Specific Parameters		
Number of simultaneous Associations by Service and/or SOP Class ?	No	50
Verification SCU Parameters		
No specific configuration required		
Modality Worklist SCU Parameters		
Maximum Query Responses (Modality Worklist IM, Patient Root Q/R IM and Study Root Q/R IM)	Yes (10-999)	200
Automatic MWL update	Yes	Enabled
Today's Patient List Refresh Rate (Modality Worklist Polling Interval)	Yes (Min. – Max.)	5 min.
Scheduled Station AE Title	Yes	EMPTY
Patient Root Q/R and Study Root Q/R SCU Parameters		
Maximum Query Responses (Modality Worklist IM, Patient Root Q/R IM and Study Root Q/R IM)	Yes (10-999)	200
Extended Negotiation – relational query support negotiation (Patient Root Q/R IM)	Yes	Yes
Storage Commitment SCU Parameters		
Storage Commitment enable/disable	Yes	Disabled
Storage commitment interval	No	15 min
Number of retrials on error	Yes	3
Storage SCU Parameters		
Interval of automatic storage of non-archived instances	Yes	5
Verification SCP Parameters		
No specific configuration required The configuration of port number and Application Entity Title are part of the Local Application Entity setup (see 4.4.1.1Local AE Titles).		

5 Media Interchange

Media Interchange is not scope of this document since Media Interchange is not supported by PRIMUS 200 Application Software.

6 Support of Character Sets

All application entities described in the previous chapters support UTF-8 character set.

Table 6-1 Supported Character Set

Supported Specific Character Set	
Character Set Description	Defined Term
UTF-8 encoded Unicode	ISO_IR 192

7 Security

The DICOM capabilities of the PRIMUS 200 Application Software do not support any specific security measures.

It is assumed that PRIMUS 200 Application Software is used within a secured environment. It is assumed that a secured environment includes at a minimum:

- Firewall or router protections to ensure that only approved external hosts have network access to PRIMUS 200 Application Software
- Firewall or router protections to ensure that PRIMUS 200 Application Software only has network access to approved external hosts and services.
- Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

8 Annexes

8.1 IOD Contents

8.1.1 Created SOP Instance(s)

Abbreviations used for presence of values:

VNAP

Value Not Always Present (attribute sent zero length if no value is present) – Applicable for Type 2, 2C.

ANAP

Attribute is not always present – Applicable for Type 3

ALWAYS

Attribute is always present with a value – Applicable for Type 1

EMPTY

Attribute is sent without a value – Applicable for Type 2

Abbreviations used for sources of data:

USER

The attribute value source is from User input

AUTO

The attribute value is generated automatically

MWL, MPPS, etc.

The attribute value is the same as the value received using a DICOM service such as Modality Worklist, Modality Performed Procedure Step, etc.

CONFIG

The attribute value source is a configurable parameter

ACQUISITION

The sources of data come from data acquisition process. Include Image and data relate to Image

ANALYSIS

The sources of data come from data generate by application or add/edit/update by user when images are analyzed.

SRQ

The attribute value is same as the value received using a DICOM service such as Study Root Query.

8.1.1.1 Encapsulated PDF Information Object Definition

IE	Module	Usage
Patient		
	Patient	ALWAYS
Study		
	General Study	ALWAYS
Series		
	Encapsulated Document Series	ALWAYS
Equipment		
	General Equipment	ALWAYS
	Sc Equipment	ALWAYS
EncapsulatedDocument		
	Encapsulated Document	ALWAYS
	Sop Common	ALWAYS

Table 8-1 Encapsulated Pdf IOD - Module "Patient"

Tag	Type	VR	Name	Description	PoV	Source
(0010,0010)	2	PN	Patient's Name	Patient's full name.	VNAP	USER, MWL, SRQ
(0010,0020)	2	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	USER, MWL, SRQ
(0010,0021)	3	LO	Issuer of Patient ID	Identifier of the Assigning Authority (system, organization, agency, or department) that issued the Patient ID. Note: Equivalent to HL7 v2 CX component 4 subcomponent 1.	ANAP	CONFIG, MWL, SRQ
(0010,0030)	2	DA	Patient's Birth Date	Birth date of the patient.	VNAP	USER, MWL, SRQ
(0010,0040)	2	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	USER, MWL, SRQ
(0010,1000)	3	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient.	ANAP	MWL, SRQ
(0010,2160)	3	SH	Ethnic Group	Ethnic group or race of the patient.	ANAP	MWL, SRQ
(0010,4000)	3	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, SRQ,

Table 8-2 Encapsulated Pdf IOD - Module "General Study"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. Always start with "1.2.276.0.75.2.6.10.1.1"	ALWAYS	MWL, AUTO
(0008,0020)	2	DA	Study Date	Date the Study started.	ALWAYS	AUTO
(0008,0030)	2	TM	Study Time	Time the Study started.	ALWAYS	AUTO
(0008,0090)	2	PN	Referring Physician's Name	Name of the patient's referring physician	VNAP	MWL
(0020,0010)	2	SH	Study ID	User or equipment generated Study identifier. In scheduled case, same as Requested Procedure ID. For unscheduled case, it indicates the study date time in seconds.	ALWAYS	AUTO, MWL
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study. For the scheduled case this value is filled via MWL. For the unscheduled case this will be empty.	VNAP	MWL
(0008,1030)	3	LO	Study Description	Institution-generated description or classification of the Study (component) performed. In scheduled case, same as Requested Procedure Description. Will not be present otherwise.	ANAP	MWL
(0008,1110)	3	SQ	Referenced Study Sequence	A sequence that provides reference to a Study SOP Class/Instance pair. One or more Items are permitted in this Sequence.	ANAP	MWL
>(0008,1150)	1	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class.	ALWAYS	MWL
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance.	ALWAYS	MWL
(0008,1032)	3	SQ	Procedure Code Sequence	A Sequence that conveys the type of procedure performed. One or more Items are permitted in this Sequence.	ANAP	MWL
>(0008,0100)	1	SH	Code Value	See NEMA PS3.3 Section 8.1.	ALWAYS	MWL
>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2.	ALWAYS	MWL
>(0008,0103)	1C	SH	Coding Scheme Version	See NEMA PS3.3 Section 8.2. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously. May be present otherwise.	ANAP	MWL
>(0008,0104)	1	LO	Code Meaning	See NEMA PS3.3 Section 8.3.	ALWAYS	MWL

Table 8-3 Encapsulated Pdf IOD - Module "Encapsulated Document Series"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0060)	1	CS	Modality	The modality appropriate for the encapsulated document. This Type definition shall override the definition in the SC Equipment Module. See NEMA PS3.3 Section C.7.3.1.1.1 for Defined Terms. Value is always OPT	ALWAYS	AUTO
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series. Always start with "1.2.276.0.75.2.6.10.1.2"	ALWAYS	AUTO
(0020,0011)	1	IS	Series Number	A number that identifies the Series. Always 1.	ALWAYS	AUTO
(0018,1030)	3	LO	Protocol Name	Description of the conditions under which the Series was performed. Always same as series description.	ANAP	AUTO
(0008,103E)	3	LO	Series Description	Description of the Series Internally generated value based on scan patterns. Can have the following values, Macular Cube 512x32, Optic Disc Cube 128x128, HD 1 Line, HD 5 Line Raster, HD Anterior Cornea, HD Anterior Angle View	ANAP	AUTO
(0040,0275)	3	SQ	Request Attributes Sequence	Sequence that contains attributes from the Imaging Service Request. One or more Items are permitted in this sequence.	ANAP	MWL
>(0040,1001)	1C	SH	Requested Procedure ID	Identifier that identifies the Requested Procedure in the Imaging Service Request. Required if procedure was scheduled. May be present otherwise. Note: The condition is to allow the contents of this macro to be present (e.g., to convey the reason for the procedure, such as whether a mammogram is for screening or diagnostic purposes) even when the procedure was not formally scheduled and a value for this identifier is unknown, rather than making up a dummy value.	ALWAYS	MWL
>(0032,1060)	3	LO	Requested Procedure Description	Institution-generated administrative description or classification of Requested Procedure.	ANAP	MWL
>(0032,1064)	3	SQ	Requested Procedure Code Sequence	A sequence that conveys the Procedure Type of the requested procedure. Only a single Item is permitted in this sequence.	ANAP	MWL
>>(0008,0100)	1	SH	Code Value	See NEMA PS3.3 Section 8.1.	ALWAYS	MWL
>>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2.	ALWAYS	MWL
>>(0008,0103)	1C	SH	Coding Scheme Version	See NEMA PS3.3 Section 8.2. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously. May be present otherwise.	ANAP	MWL
>>(0008,0104)	1	LO	Code Meaning	See NEMA PS3.3 Section 8.3.	ALWAYS	MWL

>(0040,0009)	1C	SH	Scheduled Procedure Step ID	Identifier that identifies the Scheduled Procedure Step. Required if procedure was scheduled. Note: The condition is to allow the contents of this macro to be present (e.g., to convey the reason for the procedure, such as whether a mammogram is for screening or diagnostic purposes) even when the procedure step was not formally scheduled and a value for this identifier is unknown, rather than making up a dummy value.	VNAP	MWL
>(0040,0007)	3	LO	Scheduled Procedure Step Description	Institution-generated description or classification of the Scheduled Procedure Step to be performed.	ANAP	MWL
>(0040,0008)	3	SQ	Scheduled Protocol Code Sequence	Sequence describing the Scheduled Protocol following a specific coding scheme. One or more Items are permitted in this sequence.	ANAP	MWL
>>(0008,0100)	1	SH	Code Value	See NEMA PS3.3 Section 8.1.	ALWAYS	MWL
>>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2.	ALWAYS	MWL
>>(0008,0103)	1C	SH	Coding Scheme Version	See NEMA PS3.3 Section 8.2. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously. May be present otherwise.	ANAP	MWL
>>(0008,0104)	1	LO	Code Meaning	See NEMA PS3.3 Section 8.3.	ALWAYS	MWL
(0040,0244)	3	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started. Same as Acquisition DateTime	ALWAYS	AUTO
(0040,0245)	3	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started. Same as Acquisition DateTime	ALWAYS	AUTO
(0040,0254)	3	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed. Copied from Series Description	ANAP	MWL

Table 8-4 Encapsulated Pdf IOD - Module "General Equipment"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0070)	2	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances. Always "Carl Zeiss Suzhou Co.,Ltd"	ALWAYS	AUTO
(0008,0080)	3	LO	Institution Name	Institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
(0008,0081)	3	ST	Institution Address	Mailing address of the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG

(0008,1010)	3	SH	Station Name	User defined name identifying the machine that produced the composite instances.	ANAP	CONFIG
(0008,1040)	3	LO	Institutional Department Name	Department in the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
(0008,1090)	3	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances. Always PRIMUS 200	ALWAYS	CONFIG
(0018,1000)	3	LO	Device Serial Number	Manufacturer's serial number of the equipment that produced the composite instances. Note: This identifier corresponds to the device that actually created the images, such as a CR plate reader or a CT console, and may not be sufficient to identify all of the equipment in the imaging chain, such as the generator or gantry or plate.	ALWAYS	CONFIG
(0018,1020)	3	LO	Software Version(s)	Manufacturer's designation of software version of the equipment that produced the composite instances. See NEMA PS3.3 Section C.7.5.1.1.3. The attribute will have two values, <acquisition software version>\<DICOM export SW version>, where acquisition software version being the version on which the raw data is generated. Value for DICOM export SW version: "2.2.30.0" or higher versions of "2.2.x.y".	ALWAYS	CONFIG

Table 8-5 Encapsulated Pdf IOD - Module "Sc Equipment"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0064)	1	CS	Conversion Type	Describes the kind of image conversion. Defined Terms : DV = Digitized Video DI = Digital Interface DF = Digitized Film WSD = Workstation SD = Scanned Document SI = Scanned Image DRW = Drawing SYN = Synthetic Image Always "SYN" for Synthetic Image	ALWAYS	AUTO

Table 8-6 Encapsulated Pdf IOD - Module "Encapsulated Document"

Tag	Type	VR	Name	Description	PoV	Source
(0020,0013)	1	IS	Instance Number	A number that identifies this SOP Instance. The value shall be unique within a series. Always 1	ALWAYS	AUTO
(0008,0023)	2	DA	Content Date	The date the document content creation was started.	ALWAYS	AUTO
(0008,0033)	2	TM	Content Time	The time the document content creation was started.	ALWAYS	AUTO
(0008,002A)	2	DT	Acquisition Datetime	The date and time that the original generation of the data in the document started.	ALWAYS	AUTO
(0020,0062)	3	CS	Image Laterality	Laterality of the (possibly paired) body part that is the subject of the encapsulated document. Enumerated Values: R = right L = left U = unpaired B = both left and right	ALWAYS	AUTO

(0028,0301)	1	CS	Burned In Annotation	Indicates whether or not the encapsulated document contains sufficient burned in annotation to identify the patient and date the data was acquired. Enumerated Values: YES NO Identification of patient and date as text in an encapsulated document (e.g., in an XML attribute or element) is equivalent to "burned in annotation". A de-identified document may use the value NO. Always "YES"	ALWAYS	AUTO
(0042,0013)	1C	SQ	Source Instance Sequence	A sequence that identifies the set of Instances that were used to derive the encapsulated document. One or more Items shall be included in this Sequence. Required if derived from one or more DICOM Instances. May be present otherwise.	ANAP	AUTO
>(0008,1150)	1	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class.	ALWAYS	AUTO
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance.	ALWAYS	AUTO
(0042,0010)	2	ST	Document Title	The title of the document. Note: In the case of a PDF encapsulated document, this may be the value of the "Title" entry in the "Document Information Directory" as encoded in the PDF data. Attribute can have following values, OU ONH and RNFL OU Analysis, OS ONH and RNFL OU Analysis, OD ONH and RNFL OU Analysis, OS Macular Thickness Analysis, OD Macular Thickness Analysis, OS 5 Line High Definition Images, OD 5 Line High Definition Images, OS 1 Line High Definition Images, OD 1 Line High Definition Images, OD Cornea Analysis, OS Cornea Analysis, OD Angle View Analysis, OS Angle View Analysis	ALWAYS	AUTO
(0040,A043)	2	SQ	Concept Name Code Sequence	A coded representation of the document title. Zero or one Item shall be included in this sequence.	EMPTY	AUTO
(0042,0012)	1	LO	MIME Type of Encapsulated Document	The type of the encapsulated document stream described using the MIME Media Type (see RFC 2046). Always "application/pdf"	ALWAYS	AUTO
(0042,0011)	1	OB	Encapsulated Document	Encapsulated Document stream, containing a document encoded according to the MIME Type.	ALWAYS	AUTO

Table 8-7 Encapsulated Pdf IOD - Module "Sop Common"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0016)	1	UI	SOP Class UID	Uniquely identifies the SOP Class. See C.12.1.1.1 for further explanation. See also PS 3.4.	ALWAYS	AUTO
(0008,0018)	1	UI	SOP Instance UID	Uniquely identifies the SOP Instance. See C.12.1.1.1 for further explanation. See also PS 3.4.	ALWAYS	AUTO
(0008,0005)	1C	CS	Specific Character Set	Character Set that expands or replaces the Basic Graphic Set. Required if an expanded or replacement character set is used. See C.12.1.1.2 for Defined Terms. Always "ISO_IR 192" for UTF-8 encoded Unicode	ALWAYS	AUTO
(0008,0012)	3	DA	Instance Creation Date	Date the SOP Instance was created.	ALWAYS	AUTO
(0008,0013)	3	TM	Instance Creation Time	Time the SOP Instance was created.	ALWAYS	AUTO

8.1.2 Usage of Attributes from Received IOD's

The usage of attributes of Modality Worklist IODs is described in chapter 4.2.1.3.2 Activity – Query Modality Worklist.

8.1.3 Attribute Mapping

In scheduled case, the following attributes are mapped from Modality Worklist to instances of Encapsulated PDF IOD.

Modality Worklist		Instance IOD		Editable
(0010,0010)	Patient's Name	(0010,0010)	Patient's Name	No
(0010,0020)	Patient ID	(0010,0020)	Patient ID	No
(0010,0021)	Issuer of Patient ID	(0010,0021)	Issuer of Patient ID	No
(0010,1000)	Other Patient IDs	(0010,1000)	Other Patient IDs	No
(0010,0030)	Patient's Birth Date	(0010,0030)	Patient's Birth Date	No
(0010,0040)	Patient's Sex	(0010,0040)	Patient's Sex	No
(0010,2160)	Ethnic Group	(0010,2160)	Ethnic Group	No
(0010,4000)	Patient Comments	(0010,4000)	Patient Comments	No
(0008,0050)	Accession Number	(0008,0050)	Accession Number	No
(0008,0090)	Referring Physicians Name	(0008,0090)	Referring Physicians Name	No
(0040,1001)	Requested Procedure ID	(0020,0010)	Study ID	No
		(0040,0275)>(0040,1001)	Request Attributes Sequence >Requested Procedure ID	No
(0032,1060)	Requested Procedure Description	(0008,1030)	Study Description	No
		(0040,0275)>(0032,1060)	Request Attributes Sequence > Requested Procedure Description	No
(0032,1064)	Requested Procedure Code Sequence	(0008,1032)	Procedure Code Sequence	No
>(0008,0100)	Code Value	>(0008,0100)	Code Value	No
>(0008,0102)	Coding Scheme Designator	>(0008,0102)	Coding Scheme Designator	No
>(0008,0103)	Coding Scheme Version	>(0008,0103)	Coding Scheme Version	No
>(0008,0104)	Code Meaning	>(0008,0104)	Code Meaning	No
(0020,000D)	Study Instance UID	(0020,000D)	Study Instance UID	No
(0008,1110)	Referenced Study Sequence	(0008,1110)	Referenced Study Sequence	No
>(0008,1150)	Referenced Sop Class UID	>(0008,1150)	Referenced Sop Class UID	No
>(0008,1155)	Referenced Sop Instance UID	>(0008,1155)	Referenced Sop Instance UID	No
(0040,0100)	Scheduled Procedure Step Sequence			No

>(0040,0007)	Scheduled Procedure Step Description	(0040,0275)>(0040,0007)	Request Attributes Sequence > Scheduled Procedure Step Description	No
>(0040,0008)	Scheduled Protocol Code Sequence	(0040,0275)>(0040,0008)	Request Attributes Sequence > Scheduled Protocol Code Sequence	No
>>(0008,0100)	Code Value	>(0008,0100)	Code Value	No
>>(0008,0102)	Coding Scheme Designator	>(0008,0102)	Coding Scheme Designator	No
>>(0008,0103)	Coding Scheme Version	>(0008,0103)	Coding Scheme Version	No
>>(0008,0104)	Code Meaning	>(0008,0104)	Code Meaning	No
>(0040,0009)	Scheduled Procedure Step ID	(0040,0275)>(0040,0009)	Request Attributes Sequence > Scheduled Procedure Step ID	No

8.1.4 Coerced/Modified Files

Those tags are listed in chapter 4.2.1.3.2Activity – Query Modality Worklist. Other attributes get lost and are not available in the PRIMUS 200 Application Software.

8.2 Data Dictionary of Private Attributes

The Application Software AE does not define Private Attributes of interest.

8.3 Coded Terminology and Templates

The Application Software AE does not uses any custom coded terminology.

8.4 Greyscale Image Consistency

Not applicable.

8.5 Standard Extended / Specialized/ Private SOP Classes

Not applicable.

8.6 Private Transfer Syntaxes

No Private Transfer Syntax is supported.

The product meets the essential requirements stipulated in Annex I of the 93/42/EEC Directive governing medical devices. The product is labeled with:



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