CARL ZEISS MEDITEC

DICOM Conformance Statement

VISUCONNECT 500

Version 1.0.6

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1 Conformance Statement Overview

VISUCONNECT 500 converts the serial data stream from the devices of the ZEISS Essential Line into a data format that can be read and stored by DICOM-compatible systems or by a patient management system (PMS).

VISUCONNECT 500 itself implements one single DICOM Application Entity. For functionalities such as:

- query modality worklist
- query patients
- archive measurement data (SRF, AR, KER, LEN)

a separate Application Entity for each connected device is required.

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		
Raw Data Storage (IOP Measurements)	Yes	No
Autorefraction Measurements Storage	Yes	No
Keratometry Measurements Storage	Yes	No
Lensometry Measurements Storage	Yes	No
Encapsulated PDF Storage	Yes	No
Workflow Management		
Verification	Yes	Yes
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

The VISUCONNECT 500 does not support Media Interchange.

2 Table of Contents

3 Introduction

3.1 Revision History

Document Version	Date	Author	Changes
1.0	17.09.2015	M. Hebebrand	Initial Release
1.1	01.10.2015	M. Hebebrand	Updated DCS
1.2	20.10.2015	M. Hebebrand	Updated DCS

3.2 Audience

This document is written for the people that need to understand how VISUCONNECT 500 will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product. This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between VISUCONNECT 500 and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

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.

Module

a 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.

PACS

Picture Archive and Communciation System

PMS

Patient Management System

Presentation Context

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

Query Key

A 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.

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
AE	Application Entity
AET	Application Entity Title
ANAP	Attribute is not always present - applicable for type 3 attributes
APP	Application
AR	Autorefraction
AUTO	Automatically generated, cannot be modified by the operator
BRQ	Broad Query mode of Modality Worklist Query
CCH	Cache
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
KER	Keratometry
LEN	Lensometry
MWL	Modality Worklist
OD	Oculus Dexter, the right eye
OS	Oculus Sinister, the left eye
OU	Oculus Uterque, both eyes

Abbreviation	Definition
PL	Pick list
PLD	Pick list item details
QR	Query
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.
SRF	Subjective Refraction
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/)

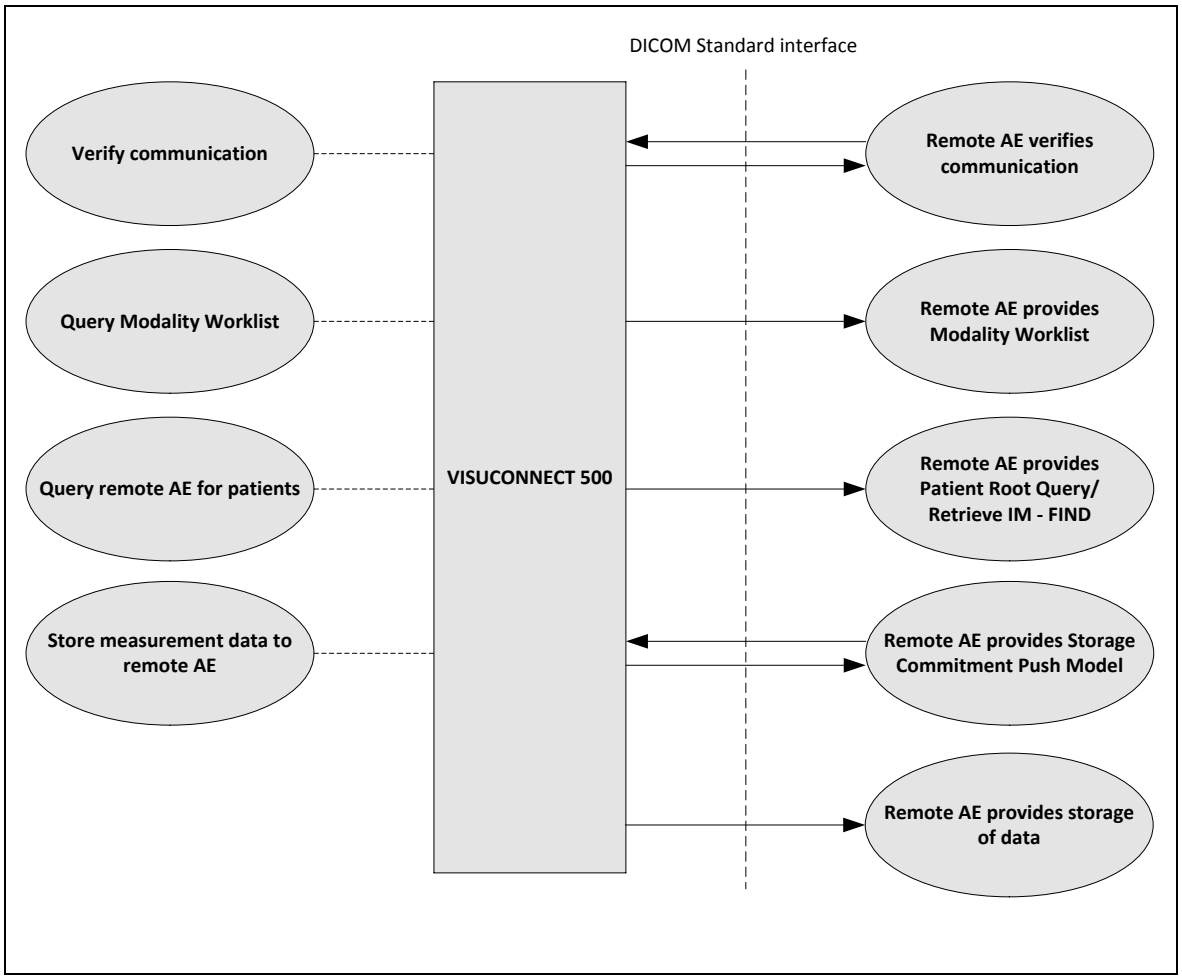
Integrating the Healthcare Enterprise (IHE) EYECARE Technical Framework, rev 3.7, 2010 (available free at http://www.ihe.net/Technical_Framework/index.cfm

4 Networking

4.1 Implementation Model

4.1.1 Application Data Flow

Figure 4-1 VISUCONNECT 500 Software as Acquisition Modality



4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of VISUCONNECT 500

VISUCONNECT 500 converts the serial data stream from the devices of the ZEISS Essential Line into a data format that can be read and stored by DICOM-compatible systems or by a patient management system (PMS).

VISUCONNECT 500 itself implements one single DICOM Application Entity. For functionalities such as:

- query modality worklist
- query patients
- archive measurement data (SRF, AR, KER, LEN)

a separate Application Entity for each connected device is required.

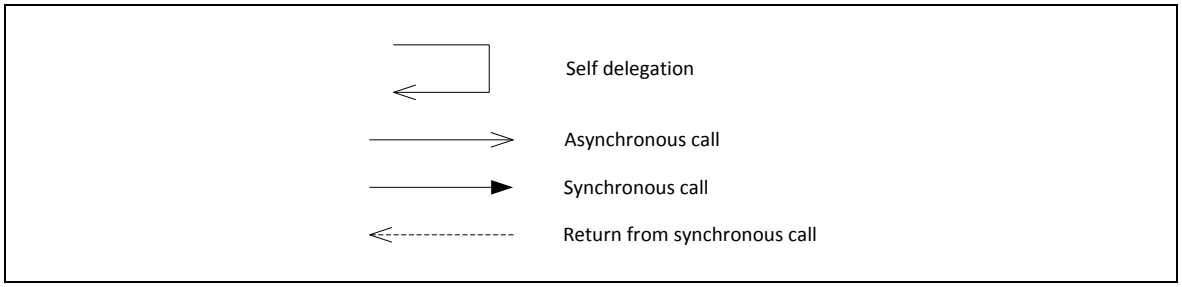
The VISUCONNECT 500 software allows performing a verification of the configured AE. The result of this verification contains information about the supported SOP Classes and Transfer Syntaxes.

All DICOM functionalities have been integrated into the application user interface and will not require any manual invoking of DICOM specific user interface.

The VISUCONNECT 500 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 user starts VISUCONNECT 500, the worklist for all connected essential line diagnostic devices is queried automatically. The user can also invoke this by simply clicking the Load MWL button in the patient screen. The patient list lists all patients scheduled for today for the modalities “Autorefraction” (AR), “Lensometry” (LEN) and “Intra Ocular Pressure” (IOP) .

In either way the operator can select a patient from the result list

The VISUCONNECT 500 can’t handle multiple Scheduled Procedure Steps in one Scheduled Procedure.

Query remote AE for patients

The operator can search patients stored at a remote AE. This can be done by using the “Search field” in the “Patient” screen. Any matching results will be listed in patient list. Only data supported by VISUCONNECT 500 will be listed.

This activity generates an unscheduled case.

The operator can then select the patient.

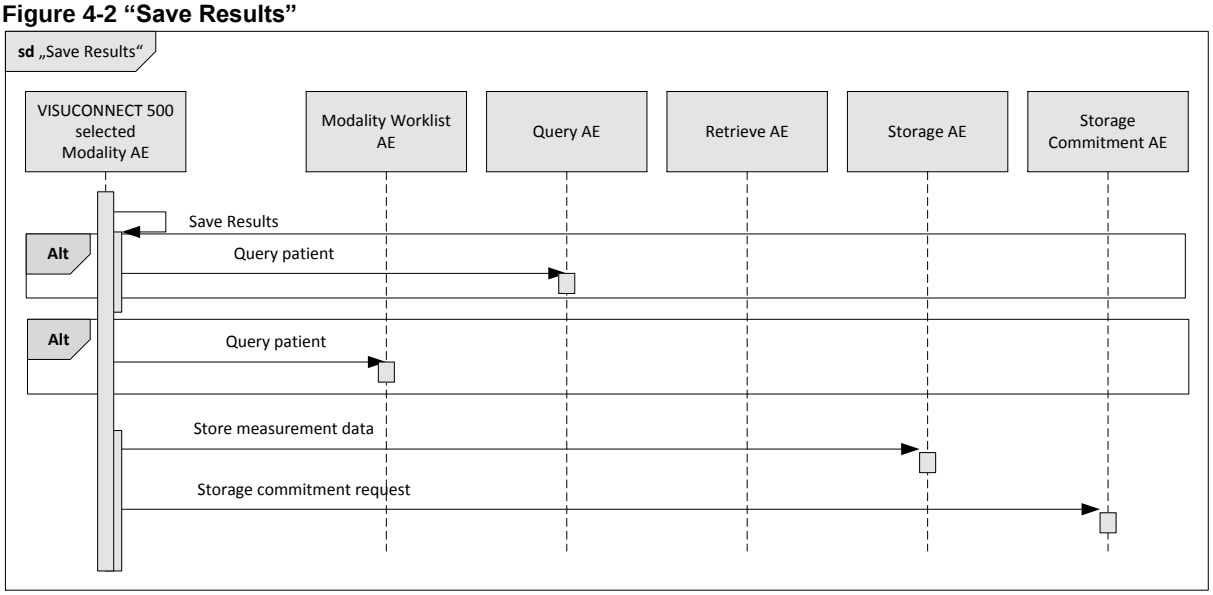
Store measurement data to remote AE

This activity is triggered by the “Save” button in the “Result” screen. During this activity acquired measurement data are transferred to the configured Storage Provider. To ensure data consistency a new patient query is issued.

After the storage, the Software asks the configured Storage Commitment Provider to take over responsibility on data persistence for the data previously transferred.

4.1.3.2 Common sequences

Figure 4-2 “Save Results”



VISUCONNECT 500 reacts only as DICOM broker. Several Apllication Entities communicate through one DICOM instance. Hence, received measurement results are transferred through VISUCONNECT 500 software to the connected data archive with repect to the selected device type, i.e. LEN for Lensometry measurements.

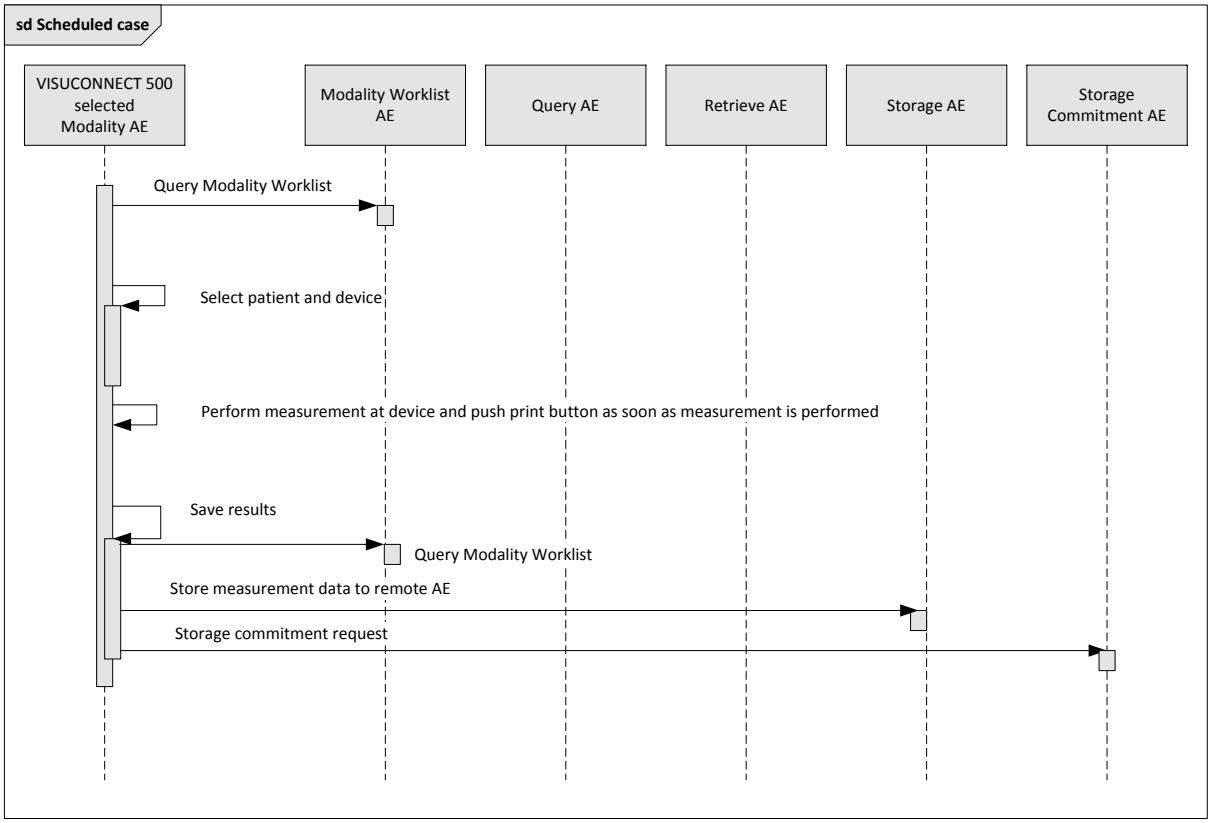
4.1.3.3 Scheduled case with Acquisition Modality

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 a supported essential line diagnostic device (VISULENS 500, VISUREF 100, and VISUPLAN 500).
- 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 VISUCONNECT 500 these patients appear in the patient list in the main screen. This information is used to take the examination.

Figure 4-3 Scheduled Case

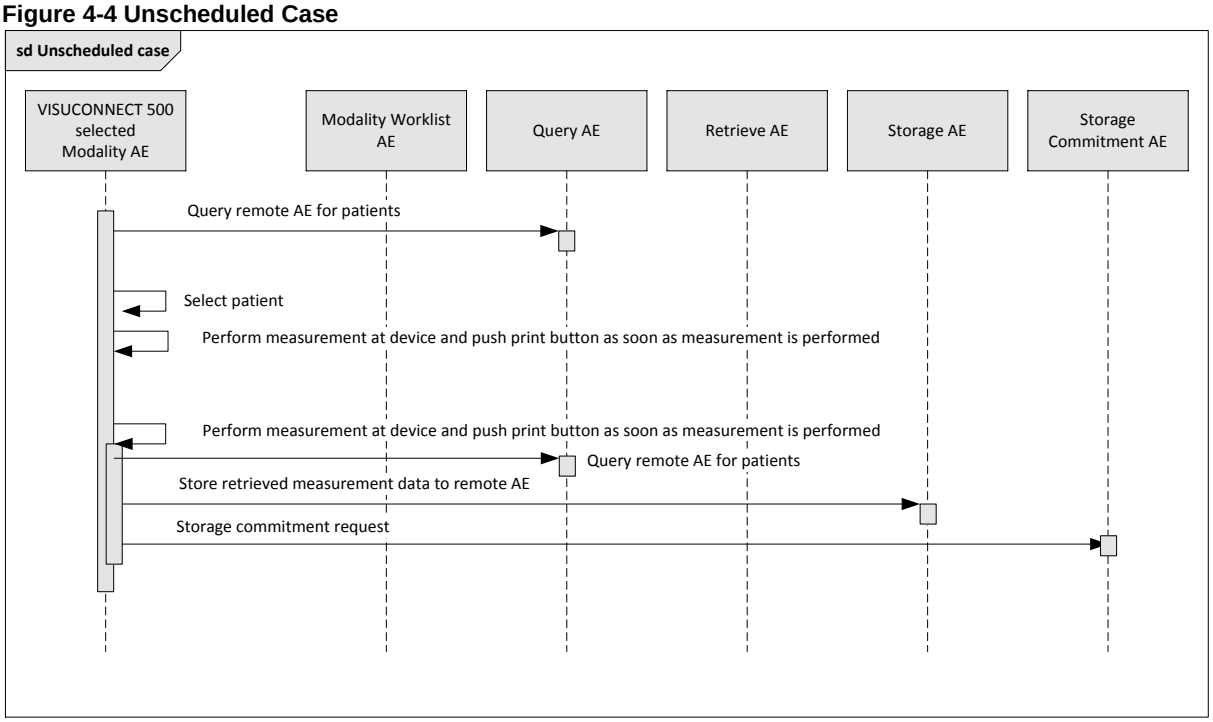


4.1.3.4 Unscheduled case

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 4-4 Unscheduled Case



4.2 AE Specifications

4.2.1 VISUCONNECT 500 AE Specification

4.2.1.1 SOP Classes

Table 4-1 SOP Classes for VISUCONNECT 500 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
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1	Yes	No
Autorefraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2	Yes	No
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3	Yes	No
Raw Data Storage	1.2.840.10008. 5.1.4.1.1.66	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
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No

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

VISUCONNECT 500 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

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 device startup phase. It facilitates the setup and management of the DICOM Application Entities.

In the association request VISUCONNECT 500 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-sequent step a C-ECHO message is exchanged.

If the “Verify Communication” activity fails, no database connection will be established on the VISUCONNECT 500 software.

4.2.1.3.1.2 Proposed Presentation Contexts

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

- Verification with Transfer Syntax ILE as SCU

Table 4-5 Presentation Contexts proposed by the VISUCONNECT 500 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
Lensometry Measurements Storage	5.1.4.1.1.78.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Autorefraction Measurements Storage	5.1.4.1.1.78.2	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Keratometry Measurements Storage	5.1.4.1.1.78.3	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Raw Data Storage[1]	5.1.4.1.1.66	ILE	1.2	SCU	No
		ELE	1.2.1	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
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: SOP Classes is negotiated and used for Intra Ocular Pressure Measurments.

4.2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

The VISUCONNECT 500 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.

4.2.1.3.2.1 Description and Sequencing of Activities

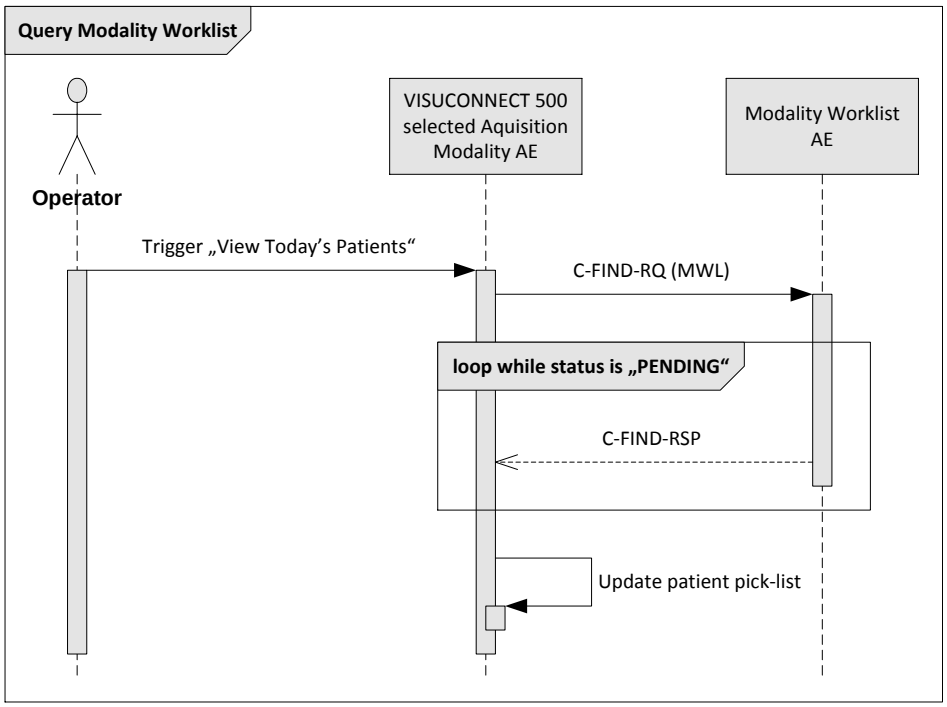
VISUCONNECT 500 performs a query with predefined query keys. The operator cannot change the query key values. The applied query keys are:

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

Tag	Attribute Name	Description
(0040,0100)	Scheduled Procedure Step Sequence	
>(0008,0060)	Modality	Uses the modality as configured for the VISUCONNECT 500 instrument.
>(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.

Figure 4-5 Interactive Query



Trigger "View Today's Patients"

The activity "Query Modality Worklist" can be triggered by operator if the search text field is empty by simply click the "Load MWL" button in the patient screen. It is meaningful to perform the query when the patient arrives at the modality. Then the patient list contains the latest information.

4.2.1.3.2.2 Proposed Presentation Contexts

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

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

Table 4-7 Proposed Presentation Contexts by the VISUCONNECT 500 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
Lensometry Measurements Storage	5.1.4.1.1.78.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Autorefraction Measurements Storage	5.1.4.1.1.78.2	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Keratometry Measurements Storage	5.1.4.1.1.78.3	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Raw Data Storage[1]	5.1.4.1.1.66	ILE	1.2	SCU	No
		ELE	1.2.1	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
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: Raw Data Storage is used for Intra Ocular Pressure Measurements.

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
Failure	Identifier Does Not Match SOP Class	A900	Log message
Failure	Unable to process	C000-CFFF	Log message
Failure	Refused: SOP class not supported	0122	Log 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.

Service Status	Further Meaning	Error Code	Behavior
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 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 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 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 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

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		X			X
>(0040,0003)	Scheduled Procedure Step Start Time		X			X
>(0040,0002)	Scheduled Procedure Step Start Date	BRQ	X			X
>(0008,0060)	Modality	BRQ	X			X
>(0040,0006)	Scheduled Performing Physicians Name					
>(0040,0007)	Scheduled Procedure Step Description		X			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			X
>(0040,0012)	Pre-Medication					
>(0040,0009)	Scheduled Procedure Step ID		X			X
>(0032,1070)	Requested Contrast Agent					

Tag	Tag Name	Query Key	Imported	Displayed	Modifiable	SOP Instance
Requested Procedure						
(0040,1001)	Requested Procedure ID		X			X
(0032,1060)	Requested Procedure Description		X			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			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			X
Imaging Service Request						
(0008,0050)	Accession Number		X			X
(0032,1032)	Requesting Physician		X			X
(0008,0090)	Referring Physicians Name		X			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]		X	PL		X
(0010,0020)	Patients ID		X	PL		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		X
(0010,0040)	Patients Sex		X	PL		X
(0010,1030)	Patients Weight					
(0040,3001)	Confidentiality Constraint on Patient Data Description					

Tag	Tag Name	Query Key	Imported	Displayed	Modifiable	SOP Instance
(0010,4000)	Patients Comments		X	APP		X
Patient Medical						
(0038,0500)	Patient State					
(0010,21C0)	Pregnancy Status					
(0010,2000)	Medical Alerts					
(0038,0050)	Special Needs					

Note 1: 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. The priority order is: ideographic, phonetic, alphabetic.

Values of column "Query Key":

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.

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.

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 8.1.3 Attribute Mapping. These values are used for Storage.

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 4-10 Modality Worklist query key details - Broad Query

Tag	Tag Name	Description
(0040,0100)	Scheduled Procedure Step	This attribute is the container for the tags as listed below. The sequence contains one item.

	Sequence	
>(0040,0002)	Scheduled Procedure Step Start Date	The value is today's date.
>(0008,0060)	Modality	The value is "LEN", "AR", and "IOP".

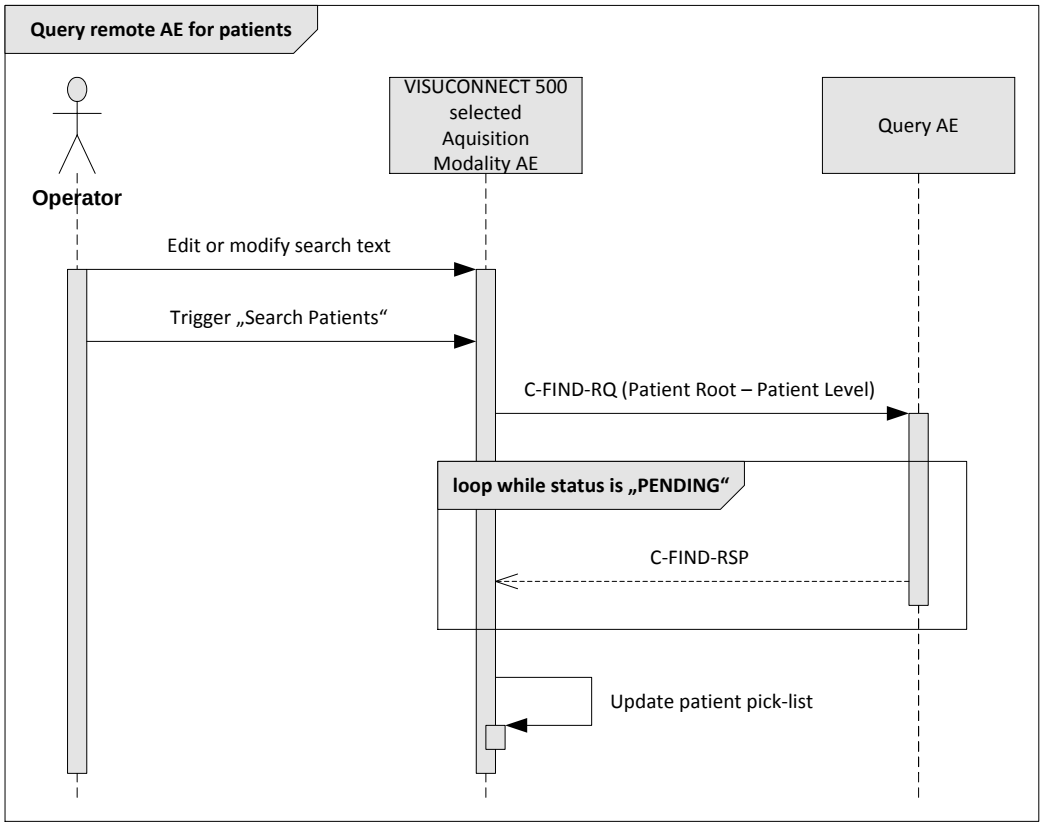
4.2.1.3.3 Activity – Query remote AE for patients

Query is used to get patient information and meta data of instances on a DICOM server.

4.2.1.3.3.1 Description and Sequencing of Activities

In the patient screen the user can trigger a search in "Patient Family Name" and/or in "Patient Given Name" in parallel or in "Patient ID".

Figure 4-6 Query for patients



Edit or modify search text

There is only one edit field to enter the search text.

The syntax of the search text is “[<Patient Family Name>][,<Patient Given Name>]” for name search and “#id” for Patient ID search. The search for Patient Name is case insensitive and has automaticalle a trailing wildcard (*) to fulfil the ‘starts with’ condition.

- (0010,0010) Patient’s Name – Family Name
- (0010,0010) Patient’s Name – Given Name
- (0010,0020) Patient ID

For more details on supported query keys see Table 4-14 Query key details.

Trigger “Search Patients”

The operator triggers the search after he or she filled in search criteria by pressing the “Enter” key. The Software sends a Patient Root based DICOM C-FIND request which contains the entered search criteria. The Software waits for the response from the Query AE and accepts up to a configurable number of matches.
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.

4.2.1.3.3.2 Proposed Presentation Contexts

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

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

Table 4-11 Proposed Presentation Contexts by the VISUCONNECT 500 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
Lensometry Measurements Storage	5.1.4.1.1.78.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Autorefraction Measurements Storage	5.1.4.1.1.78.2	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Keratometry Measurements Storage	5.1.4.1.1.78.3	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Raw Data Storage[1]	5.1.4.1.1.66	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID 1.2.840.10008. ...**	**Name List**	**UID List 1.2.840.10008. ...**		
Patient Root Query/Retrieve IM – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	Yes
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: More SOP Classes are negotiated by application then are used.

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

Table 4-12 Query C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Failure	Refused: Out of Resources	A700	Log message.
Failure	Identifier does not match SOP Class	A900-A9FF	Log message.
Failure	Unable to process	C000-CFFF	Log message.
Failure	Refused: SOP class not supported	0122	Log message.
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 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 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 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 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.

Table 4-13 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		X	X		
(0010,0032)	Patient's Birth Time					
(0010,0040)	Patient's Sex		X	X		
(0010,1000)	Other Patient IDs					
(0010,2160)	Ethnic Group					
(0010,4000)	Patient Comments		X	X		

[1] Note: 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. The priority order is: ideographic, phonetic, alphabetic. The name what have been entered as query key will be always sent in the Alphabetic group of the C-Find-RQ.

Values of column "Query Key":

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 8.1.3 Attribute Mapping.

Table 4-14 Query key details

Tag	Tag Name	Description
(0010,0010)	Patient's Name	The default value is empty string. Only family name and given name can be used as query keys. The search use always a trailing '*' as wild card. This is a DICOM Standard query key on Patient level.
(0010,0020)	Patient ID	The operator can enter each value that conforms to the Value Representation LO. This is a DICOM Standard query key on Patient level.

4.2.1.3.4 Activity – Perform measurments

Operator can trigger a measurement as soon as a patient and a corresponding ZEISS essential line diagnostic devices is selected by clicking the "Start measurement" button in the patient screen.

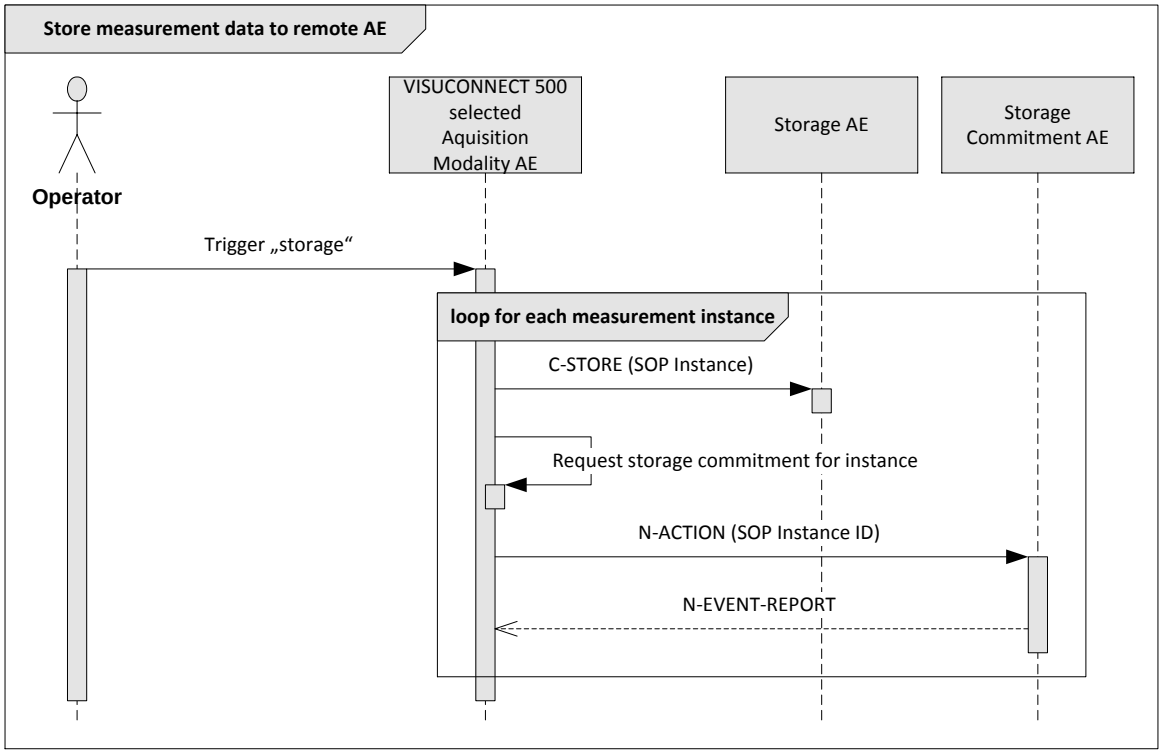
This activity has no direct relation to DICOM messaging.

During this activity, the VISUCONNECT 500 software creates measurement data. Measurement data will be stored as Autorefraction (AR), Keratoemtry (KER) or Lensometry (LEN) or Intra Ocular Pressure (RAW) SOP Instances, respectively. The received data is subject to be archived within next "Store measurement"-activity call.

4.2.1.3.5 Activity – Store measurement data to remote AE

4.2.1.3.5.1 Description and Sequencing of Activities

Figure 4-7 Store measurement data



Trigger "storage"

Pressing the 'Save measurement" button on the user interface, where measurement data are displayed, triggers a Storage request. Any Storage request triggers automatically a subsequent Storage Commitment request.

Request Storage Commitment

To verify that the data has been safely archived, the Software request the configured Storage Commitment AE after each storage request to commit the storage of instances.

4.2.1.3.5.2 Proposed Presentation Contexts

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

- Storage Commitment Push Model with Transfer Syntax ILE as SCU

Table 4-15 Presentation Contexts proposed by VISUCONNECT 500 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
Lensometry Measurements Storage	5.1.4.1.1.78.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Autorefraction Measurements Storage	5.1.4.1.1.78.2	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Keratometry Measurements Storage	5.1.4.1.1.78.3	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Raw Data Storage[1]	5.1.4.1.1.66	ILE	1.2	SCU	No
		ELE	1.2.1	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
Modality Worklist IM – FIND	5.1.4.31	ILE	1.2	SCU	No

Note 1: More SOP Classes are negotiated by application then are used.

4.2.1.3.5.3 SOP Specific Conformance for Storage SOP Classes

Table 4-16 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.

Service Status	Further Meaning	Status Code	Behavior
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 do not retry. Message to user.
Warning	Coercion of data Elements	B000	Log message and do not retry. Message to user.
Warning	Data Set does not match SOP Class	B007	Log message and do not retry. Message to user.
Warning	Elements Discarded	B006	Log message and do not retry. Message to user.
Success	Successful Storage	0000	None
Unknown	All other responses with unknown code	xxxx	Log message and do not retry. Message to user.

4.2.1.3.5.4 SOP Specific Conformance for Storage Commitment SOP Class

4.2.1.3.5.4.1 Storage Commitment Operations (N-ACTION)

All storage requests to the DICOM archive are automatically followed by a Storage Commitment request.

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

Table 4-17 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 and display user alert.
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 and display user alert.
Failure	Unrecognized operation	0211	Log message and display user alert.
Success	Success	0000	The Software will wait for an incoming N-EVENT-REPORT.

Service Status	Further Meaning	Status Code	Behavior
Unknown	All other responses with unknown code meaning.	xxxx	Log message and display user alert.

4.2.1.3.5.4.2 Storage Commitment Communication Failure Behaviour

If the 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 Software writes the SOP Instance UID to the log file, together with the failure reason.

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 Software has been started.

The FORUM driver can respond to a Verification command coming from another DICOM component, for instance coming from FORUM.

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 4-18 Presentation Context accepted by the VISUCONNECT 500 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 Software AE provides standard conformance.

4.2.1.4.2 Activity – Store measurement data to remote AE

The software uses a Storage function for measurement data. There is no Storage of images.

4.2.1.4.2.1 Description and Sequencing of Activities

4.2.1.4.2.2 Accepted Presentation Contexts

Table 4-19 Presentation Contexts accepted by the VISUCONNECT 500 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 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 Software is capable of receiving an N-EVENT-REPORT notification if it has successfully negotiated a Presentation Context for the Storage Commitment Push

In the current release of VISUCONNECT 500 the failed instances in the N-EVENT-REPORT are not considered for retry of Storgae Commitment.

4.3 Network Interfaces

4.3.1 Physical Network Interface

The instrument application uses the communication stack as offered by the Operating System.

4.3.2 Additional Protocols

IP addresses are supported and get resolved.

Multicast messages are supported to find the serial-to-ethernet adapter.

Bonjour webservice is supported for FORUM autoconnect freature.

No additional protocols are supported.

4.3.3 IPv4 and IPv6 Support

The VISUCONNECT 500 supports IPv4 as well as IPv6 Addresses to access the web interface. Adapter communication is limited to IPv4 networks.

4.4 Configuration

The VISUCONNECT 500 settings page contains a screen to configure the parameters listed in a later section named “Parameters”.

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 operator once.

4.4.1.1 Local AE Titles

The IP is not configurable by the Configuration Tool. The IP is administrated 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 VISUCONNECT 500 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.

4.4.2 Parameters

4.4.2.1 General Parameters

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

Table 4-20 Configuration Parameters Table

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
DIMSE RSP Timout	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	Error
Storage Commitment for failed instances	No	
(0008,0080) Institution Name	No	
(0008,1040) Institutional Department Name	No	
(0008,0081) Institution Address	No	
(0008,1010) Station Name	No	
(0010,0021) Issuer of Patient ID	No	
Use multiple character sets	No	
Modality Worklist SCU Parameters		
Maximum Query Responses (Modality Worklist IM, Patient Root Q/R IM and Study Root Q/R IM)	Yes (10-999)	999
Patient Root Q/R SCU Parameters		

Parameter	Configurable (Yes/No)	Default Value
Maximum Query Responses (Modality Worklist IM, Patient Root Q/R IM)	Yes (10-999)	999
Storage Commitment SCU Parameters		
Storage Commitment is always enabled		
Max, Repetition Steps	No	2
Repetition interval	No	3 sec
Storage SCU Parameters		
No specific configuration required		
Storage SCP Parameters		
No specific configuration required The configuration of port number and Application Entity Title are part of the Local Application Entity setup (see 4.4.1.1 Local AE Titles).		
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 4.4.1.1 Local AE Titles).		

5 Media Interchange

Media Interchange is not scope of this document since Media Interchange is not supported by VISUCONNECT 500 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 VISUCONNECT 500 software do not support any specific security measures.

It is assumed that VISUCONNECT 500 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 VISUCONNECT 500 software

Firewall or router protections to ensure that VISUCONNECT 500 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.

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

8.1.1.1 Autorefraction Measurements Information Object Definition

IE	Module	Usage
Patient		
	Patient	ALWAYS
Study		
	General Study	ALWAYS
Series		
	General Series	ALWAYS
	Autorefraction Measurements Series	ALWAYS
Equipment		
	Enhanced General Equipment	ALWAYS
Measurements		
	General Ophthalmic Refractive Measurements	ALWAYS
	Autorefraction Measurements	ALWAYS
	Sop Common	ALWAYS

Table 8-1 Autorefraction Measurements IOD - Module "Patient"

Tag	Type	VR	Name	Description	PoV	Source
(0010,0010)	2	PN	Patient's Name	Patient's full name.	ALWAYS	MWL, QR
(0010,0020)	2	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL, QR

Tag	Type	VR	Name	Description	PoV	Source
(0010,0021)	3	LO	Issuer of Patient ID	The issuer of patient ID is mandatory and required. MWL and Query responses are rejected in case Issuer of Patient ID is empty.	ALWAYS	MWL, QR
(0010,0030)	2	DA	Patient's Birth Date	Birth date of the patient.	ALWAYS	MWL, QR
(0010,0040)	2	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	ALWAYS	MWL, QR
(0010,1000)	3	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient.	ALWAYS	MWL, QR
(0010,2160)	3	SH	Ethnic Group	Ethnic group or race of the patient.	ANAP	MWL, QR
(0010,4000)	3	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, QR

Table 8-2 Autorefraction Measurements IOD - Module "General Study"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. ID-Root = 1.2.276.0.75.2	ALWAYS	AUTO
(0008,0020)	2	DA	Study Date	Date the Study started.	ALWAYS	ACQUISITION
(0008,0030)	2	TM	Study Time	Time the Study started.	ALWAYS	ACQUISITION
(0008,0090)	2	PN	Referring Physician's Name	Name of the patient's referring physician	EMPTY	AUTO
(0020,0010)	2	SH	Study ID	User or equipment generated Study identifier. ID-Root = 0	ALWAYS	MWL, AUTO
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study.	EMPTY	AUTO
(0008,1030)	3	LO	Study Description	Institution-generated description or classification of the Study (component) performed.	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

Tag	Type	VR	Name	Description	PoV	Source
>(0008,1150)	1	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class.	ANAP	MWL
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance.	ANAP	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.	ANAP	MWL
>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2.	ANAP	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.	ANAP	MWL

Table 8-3 Autorefraction Measurements IOD - Module "General Series"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series.	ALWAYS	AUTO
(0020,0011)	2	IS	Series Number	A number that identifies this Series. ID-Root = 0	ALWAYS	AUTO
(0008,0021)	3	DA	Series Date	Date the Series started.	ALWAYS	AUTO
(0008,0031)	3	TM	Series Time	Time the Series started.	ALWAYS	AUTO
(0018,1030)	3	LO	Protocol Name	User-defined description of the conditions under which the Series was performed. Value=Routine diagnostics measurement	ALWAYS	AUTO
(0008,103E)	3	LO	Series Description	Description of the Series. Value = Routine diagnostics measurement	ALWAYS	AUTO

Tag	Type	VR	Name	Description	PoV	Source
(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.	ANAP	MWL
>(0032,1060)	3	LO	Requested Procedure Description	Institution-generated administrative description or classification of Requested Procedure.	ANAP	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.	ANAP	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.	ANAP	MWL
>>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2. Value = CZM-FORUM	ANAP	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.	ANAP	MWL
(0040,0253)	3	SH	Performed Procedure Step ID	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.	ALWAYS	AUTO

Tag	Type	VR	Name	Description	PoV	Source
(0040,0244)	3	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0245)	3	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0254)	3	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed. Value = Routine diagnostics measurement	ALWAYS	AUTO

Table 8-4 Autorefraction Measurements IOD - Module "Autorefraction Measurements Series"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0060)	1	CS	Modality	Type of equipment that originally acquired the data used to create the images in this Series. Enumerated Values: AR See NEMA PS3.3 Section C.7.3.1.1.1 for further explanation. Value = AR	ALWAYS	AUTO

Table 8-5 Autorefraction Measurements IOD - Module "Enhanced General Equipment"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0070)	1	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances.	ALWAYS	AUTO
(0008,1090)	1	LO	Manufacturer's Model Name	Manufacturer’s model name of the equipment that produced the composite instances: Carl Zeiss Meditec	ALWAYS	ACQUISITION
(0018,1000)	1	LO	Device Serial Number	Manufacturer’s serial number of the equipment that produced the composite instances.	ALWAYS	ACQUISITION
(0018,1020)	1	LO	Software Version(s)	Manufacturer’s designation of software version of the equipment that produced the composite instances. • FORUM Driver Version: 2.4.0.0 and higher versions of 2.x.y.z. • CZM NIM, 2.8.0 and higher versions of 2.x.y. • XML Schema Version connectivity interface 1.1.7 and higher versions of 1.x.y. • Serial Data Interface Definition of Modality 1.6.0 and higher versions of 1.x.y.	ALWAYS	AUTO

Table 8-6 Autorefraction Measurements IOD - Module "General Ophthalmic Refractive Measurements"

Tag	Type	VR	Name	Description	PoV	Source
(0020,0013)	1	IS	Instance Number	A number that identifies these measurements.	ALWAYS	AUTO
(0008,0023)	1	DA	Content Date	The date the measurements data creation started.	ALWAYS	AUTO
(0008,0033)	1	TM	Content Time	The time the measurements data creation started.	ALWAYS	AUTO
(0020,4000)	3	LT	Image Comments	User-defined comments about this SOP Instance.	ALWAYS	AUTO

Table 8-7 Autorefraction Measurements IOD - Module "Autorefraction Measurements"

Tag	Type	VR	Name	Description	PoV	Source
(0046,0050)	1C	SQ	Autorefraction Right Eye Sequence	A sequence that specifies refractive measurements of a patient's right eye. Only a single item shall be included in this sequence. Required if the right eye is measured.	ANAP	ACQUISITION
>(0046,0146)	1	FD	Sphere Power	Refractive power of the eye that is the same in all meridians, measured at distance (optical infinity), in diopters.	ANAP	ACQUISITION
>(0046,0018)	1C	SQ	Cylinder Sequence	A sequence that specifies lens measurements to correct for astigmatism or measurements of an eye that has astigmatism. Required if astigmatic correction or astigmatism is measured. Only a single item shall be included in this sequence. Note: When astigmatism is present the power is NOT the same in all meridians, but has its minimum and maximum power in meridians separated by 90 degrees.	ANAP	ACQUISITION
>>(0046,0147)	1	FD	Cylinder Power	The power that is present at the power meridian (90 degrees from the axis), in diopters.	ANAP	ACQUISITION
>>(0022,0009)	1	FL	Cylinder Axis	The meridian, defined in degrees, that is 90 degrees from the power meridian.	ANAP	ACQUISITION
(0046,0052)	1C	SQ	Autorefraction Left Eye Sequence	A sequence that specifies refractive measurements of a patient's left eye. Only a single item shall be included in this sequence. Required if the left eye is measured.	ANAP	ACQUISITION
>(0046,0146)	1	FD	Sphere Power	Refractive power of the eye that is the same in all meridians, measured at distance (optical infinity), in diopters.	ANAP	ACQUISITION

Tag	Type	VR	Name	Description	PoV	Source
>(0046,0018)	1C	SQ	Cylinder Sequence	A sequence that specifies lens measurements to correct for astigmatism or measurements of an eye that has astigmatism. Required if astigmatic correction or astigmatism is measured. Only a single item shall be included in this sequence. Note: When astigmatism is present the power is NOT the same in all meridians, but has its minimum and maximum power in meridians separated by 90 degrees.	ANAP	ACQUISITION
>>(0046,0147)	1	FD	Cylinder Power	The power that is present at the power meridian (90 degrees from the axis), in diopters.	ANAP	ACQUISITION
>>(0022,0009)	1	FL	Cylinder Axis	The meridian, defined in degrees, that is 90 degrees from the power meridian.	ANAP	ACQUISITION
(0046,0060)	3	FD	Distance Pupillary Distance	Distance in mm between the pupils when the patient's object of regard is in the distance, as measured by an autorefractor.	ANAP	ACQUISITION

Table 8-8 Autorefraction Measurements IOD - Module "Sop Common"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0016)	1	UI	SOP Class UID	Value = 1.2.840.10008.5.1.4.1.1.78.2	ALWAYS	CONFIG
(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	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

Tag	Type	VR	Name	Description	PoV	Source
(0008,0201)	3	SH	Timezone Offset From UTC	Contains the offset from UTC to the timezone for all DA and TM Attributes present in this SOP Instance, and for all DT Attributes present in this SOP Instance that do not contain an explicitly encoded timezone offset. Encoded as an ASCII string in the format "&ZZXX". The components of this string, from left to right, are & = "+" or "-", and ZZ = Hours and XX = Minutes of offset. Leading space characters shall not be present. The offset for UTC shall be +0000; -0000 shall not be used. Notes: 1. This encoding is the same as described in PS 3.5 for the offset component of the DT Value Representation. 2. This Attribute does not apply to values with a DT Value Representation, that contains an explicitly encoded timezone offset. 3. The corrected time may cross a 24 hour boundary. For example, if Local Time = 1.00 a.m. and Offset = +0200, then UTC = 11.00 p.m. (23.00) the day before. 4. The "+" sign may not be omitted. Time earlier than UTC is expressed as a negative offset. Note: For example: UTC = 5.00 a.m. Local Time = 3.00 a.m. Offset = -0200 The local timezone offset is undefined if this Attribute is absent.	ALWAYS	AUTO

8.1.1.2 Keratometry Measurements Information Object Definition

IE	Module	Usage
Patient		
	Patient	ALWAYS
Study		
	General Study	ALWAYS
Series		
	General Series	ALWAYS
	Keratometry Measurements Series	ALWAYS
Equipment		
	Enhanced General Equipment	ALWAYS
Measurements		
	General Ophthalmic Refractive Measurements	ALWAYS
	Keratometry Measurements	ALWAYS
	Sop Common	ALWAYS

Table 8-9 Keratometry Measurements IOD - Module "Patient"

Tag	Type	VR	Name	Description	PoV	Source
(0010,0010)	2	PN	Patient's Name	Patient's full name.	ALWAYS	MWL, QR
(0010,0020)	2	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL, QR
(0010,0021)	3	LO	Issuer of Patient ID	The issuer of patient ID is mandatory and required. MWL and Query responses are rejected in case Issuer of Patient ID is empty.	ALWAYS	MWL, QR

Tag	Type	VR	Name	Description	PoV	Source
(0010,0030)	2	DA	Patient's Birth Date	Birth date of the patient.	ALWAYS	MWL, QR
(0010,0040)	2	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	ALWAYS	MWL, QR
(0010,1000)	3	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient.	VNAP	MWL, QR
(0010,2160)	3	SH	Ethnic Group	Ethnic group or race of the patient.	ANAP	MWL, QR
(0010,4000)	3	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, QR

Table 8-10 Keratometry Measurements IOD - Module "General Study"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. ID-Root = 1.2.276.0.75.2	ALWAYS	AUTO
(0008,0020)	2	DA	Study Date	Date the Study started.	ALWAYS	ACQUISITION
(0008,0030)	2	TM	Study Time	Time the Study started.	ALWAYS	ACQUISITION
(0008,0090)	2	PN	Referring Physician's Name	Name of the patient's referring physician	EMPTY	AUTO
(0020,0010)	2	SH	Study ID	User or equipment generated Study identifier.	ALWAYS	AUTO, MWL
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study.	EMPTY	AUTO
(0008,1030)	3	LO	Study Description	Institution-generated description or classification of the Study (component) performed.	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.	ANAP	MWL

Tag	Type	VR	Name	Description	PoV	Source
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance.	ANAP	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.	ANAP	MWL
>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2.	ANAP	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.	ANAP	MWL

Table 8-11 Keratometry Measurements IOD - Module "General Series"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series.	ALWAYS	AUTO
(0020,0011)	2	IS	Series Number	A number that identifies this Series. ID-Root = 0	ALWAYS	AUTO
(0008,0021)	3	DA	Series Date	Date the Series started.	ALWAYS	AUTO
(0008,0031)	3	TM	Series Time	Time the Series started.	ALWAYS	AUTO
(0018,1030)	3	LO	Protocol Name	User-defined description of the conditions under which the Series was performed. Value=Routine diagnostics measurement	ALWAYS	AUTO
(0008,103E)	3	LO	Series Description	Description of the Series. Value = Routine diagnostics measurement	ALWAYS	AUTO
(0040,0253)	3	SH	Performed Procedure Step ID	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.	ALWAYS	AUTO
(0040,0244)	3	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started.	ALWAYS	AUTO

Tag	Type	VR	Name	Description	PoV	Source
(0040,0245)	3	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0254)	3	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed.	ALWAYS	AUTO

Table 8-12 Keratometry Measurements IOD - Module "Keratometry Measurements Series"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0060)	1	CS	Modality	Type of equipment that originally acquired the data used to create the images in this Series. Enumerated Values: KER See NEMA PS3.3 Section C.7.3.1.1.1 for further explanation. Value = KER	ALWAYS	AUTO

Table 8-13 Keratometry Measurements IOD - Module "Enhanced General Equipment"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0070)	1	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances.	ALWAYS	AUTO
(0008,1090)	1	LO	Manufacturer's Model Name	Manufacturer’s model name of the equipment that produced the composite instances: Carl Zeiss Meditec	ALWAYS	ACQUISITION
(0018,1000)	1	LO	Device Serial Number	Manufacturer’s serial number of the equipment that produced the composite instances.	ALWAYS	AUTO
(0018,1020)	1	LO	Software Version(s)	Manufacturer’s designation of software version of the equipment that produced the composite instances. • FORUM Driver Version: 2.4.0.0 and higher versions of 2.x.y.z. • CZM NIM, 2.8.0 and higher versions of 2.x.y. • XML Schema Version connectivity interface 1.1.7 and higher versions of 1.x.y. • Serial Data Interface Definition of Modality 1.6.0 and higher versions of 1.x.y.	ALWAYS	AUTO

Table 8-14 Keratometry Measurements IOD - Module "General Ophthalmic Refractive Measurements"

Tag	Type	VR	Name	Description	PoV	Source
(0020,0013)	1	IS	Instance Number	A number that identifies these measurements.	ALWAYS	AUTO
(0008,0023)	1	DA	Content Date	The date the measurements data creation started.	ALWAYS	AUTO
(0008,0033)	1	TM	Content Time	The time the measurements data creation started.	ALWAYS	AUTO

Table 8-15 Keratometry Measurements IOD - Module "Keratometry Measurements"

Tag	Type	VR	Name	Description	PoV	Source
(0046,0070)	1C	SQ	Keratometry Right Eye Sequence	A sequence that specifies keratometric measurements of a patient's right eye, defining principal meridians wherein the steepest meridian is separated by 90 degrees from the flattest. Only a single item shall be included in this sequence. Required if the right eye is measured. Note: Consideration for steep, flat, and spherical meridians is made. For instances where spherical keratometric measurements are obtained, values specified in the steep and flat Attributes are equivalent.	ANAP	ACQUISITION
>(0046,0074)	1	SQ	Steep Keratometric Axis Sequence	A sequence that specifies the steepest meridian as defined by the greatest power of curvature and shortest radius of curvature. Only a single item shall be included in this sequence.	ANAP	ACQUISITION
>>(0046,0075)	1	FD	Radius of Curvature	The radius of curvature of the principal meridians of the cornea, measured in mm.	ANAP	ACQUISITION
>>(0046,0076)	1	FD	Keratometric Power	The refractive power of the cornea at the principal meridians, measured in diopters.	ANAP	ACQUISITION
>>(0046,0077)	1	FD	Keratometric Axis	The meridian where the keratometric radius of curvature or power is measured, in degrees.	ANAP	ACQUISITION
>(0046,0080)	1	SQ	Flat Keratometric Axis Sequence	A sequence that specifies the flattest meridian as defined by the least power of curvature and longest radius of curvature. Only a single item shall be included in this sequence.	ANAP	ACQUISITION
>>(0046,0075)	1	FD	Radius of Curvature	The radius of curvature of the principal meridians of the cornea, measured in mm.	ANAP	ACQUISITION
>>(0046,0076)	1	FD	Keratometric Power	The refractive power of the cornea at the principal meridians, measured in diopters.	ANAP	ACQUISITION
>>(0046,0077)	1	FD	Keratometric Axis	The meridian where the keratometric radius of curvature or power is measured, in degrees.	ANAP	ACQUISITION

Tag	Type	VR	Name	Description	PoV	Source
(0046,0071)	1C	SQ	Keratometry Left Eye Sequence	A sequence that specifies keratometric measurements of a patient's left eye, defining principal meridians wherein the steepest meridian is separated by 90 degrees from the flattest. Only a single item shall be included in this sequence. Required if the left eye is measured. Note: See Note for attribute Keratometry Right Eye Sequence (0046,0070)	ANAP	ACQUISITION
>(0046,0074)	1	SQ	Steep Keratometric Axis Sequence	A sequence that specifies the steepest meridian as defined by the greatest power of curvature and shortest radius of curvature. Only a single item shall be included in this sequence.	ANAP	ACQUISITION
>>(0046,0075)	1	FD	Radius of Curvature	The radius of curvature of the principal meridians of the cornea, measured in mm.	ANAP	ACQUISITION
>>(0046,0076)	1	FD	Keratometric Power	The refractive power of the cornea at the principal meridians, measured in diopters.	ANAP	ACQUISITION
>>(0046,0077)	1	FD	Keratometric Axis	The meridian where the keratometric radius of curvature or power is measured, in degrees.	ANAP	ACQUISITION
>(0046,0080)	1	SQ	Flat Keratometric Axis Sequence	A sequence that specifies the flattest meridian as defined by the least power of curvature and longest radius of curvature. Only a single item shall be included in this sequence.	ANAP	ACQUISITION
>>(0046,0075)	1	FD	Radius of Curvature	The radius of curvature of the principal meridians of the cornea, measured in mm.	ANAP	ACQUISITION
>>(0046,0076)	1	FD	Keratometric Power	The refractive power of the cornea at the principal meridians, measured in diopters.	ANAP	ACQUISITION
>>(0046,0077)	1	FD	Keratometric Axis	The meridian where the keratometric radius of curvature or power is measured, in degrees.	ANAP	ACQUISITION

Table 8-16 Keratometry Measurements IOD - Module "Sop Common"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0016)	1	UI	SOP Class UID	Value = 1.2.840.10008.5.1.4.1.1.78.3	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

Tag	Type	VR	Name	Description	PoV	Source
(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	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
(0008,0201)	3	SH	Timezone Offset From UTC	Contains the offset from UTC to the timezone for all DA and TM Attributes present in this SOP Instance, and for all DT Attributes present in this SOP Instance that do not contain an explicitly encoded timezone offset. Encoded as an ASCII string in the format "&ZZXX". The components of this string, from left to right, are & = "+" or "-", and ZZ = Hours and XX = Minutes of offset. Leading space characters shall not be present. The offset for UTC shall be +0000; -0000 shall not be used. Notes: 1. This encoding is the same as described in PS 3.5 for the offset component of the DT Value Representation. 2. This Attribute does not apply to values with a DT Value Representation, that contains an explicitly encoded timezone offset. 3. The corrected time may cross a 24 hour boundary. For example, if Local Time = 1.00 a.m. and Offset = +0200, then UTC = 11.00 p.m. (23.00) the day before. 4. The "+" sign may not be omitted. Time earlier than UTC is expressed as a negative offset. Note: For example: UTC = 5.00 a.m. Local Time = 3.00 a.m. Offset = -0200 The local timezone offset is undefined if this Attribute is absent.	ALWAYS	AUTO

8.1.1.3 Lensometry Measurements Information Object Definition

IE	Module	Usage
Patient		
	Patient	ALWAYS
Study		
	General Study	ALWAYS
Series		
	General Series	ALWAYS
	Lensometry Measurements Series	ALWAYS
Equipment		
	Enhanced General Equipment	ALWAYS
Measurements		
	General Ophthalmic Refractive Measurements	ALWAYS
	Lensometry Measurements	ALWAYS
	Visulens Lensometry Measurements	ALWAYS
	Sop Common	ALWAYS

Table 8-17 Lensometry Measurements IOD - Module "Patient"

Tag	Type	VR	Name	Description	PoV	Source
(0010,0010)	2	PN	Patient's Name	Patient's full name.	ALWAYS	MWL, QR
(0010,0020)	2	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL, QR

Tag	Type	VR	Name	Description	PoV	Source
(0010,0021)	3	LO	Issuer of Patient ID	The issuer of patient ID is mandatory and required. MWL and Query responses are rejected in case Issuer of Patient ID is empty.	ALWAYS	MWL, QR
(0010,0030)	2	DA	Patient's Birth Date	Birth date of the patient.	VNAP	MWL, QR
(0010,0040)	2	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	MWL, QR
(0010,1000)	3	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient.	VNAP	MWL, QR
(0010,2160)	3	SH	Ethnic Group	Ethnic group or race of the patient.	ANAP	MWL, QR
(0010,4000)	3	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, QR

Table 8-18 Lensometry Measurements IOD - Module "General Study"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. ID-Root = 1.2.276.0.75.2	ALWAYS	AUTO
(0008,0020)	2	DA	Study Date	Date the Study started.	ALWAYS	ACQUISITION
(0008,0030)	2	TM	Study Time	Time the Study started.	ALWAYS	ACQUISITION
(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. ID-Root = 0	ALWAYS	MWL, AUTO
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study.	VNAP	MWL
(0008,1030)	3	LO	Study Description	Institution-generated description or classification of the Study (component) performed.	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.	ANAP	MWL
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance.	ANAP	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.	ANAP	MWL
>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2.	ANAP	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.	ANAP	MWL

Table 8-19 Lensometry Measurements IOD - Module "General Series"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series.	ALWAYS	AUTO
(0020,0011)	2	IS	Series Number	A number that identifies this Series. ID-Root = 0	ALWAYS	AUTO
(0008,0021)	3	DA	Series Date	Date the Series started.	ALWAYS	AUTO
(0008,0031)	3	TM	Series Time	Time the Series started.	ALWAYS	AUTO
(0018,1030)	3	LO	Protocol Name	User-defined description of the conditions under which the Series was performed. Value=Routine diagnostics measurement	ALWAYS	AUTO
(0008,103E)	3	LO	Series Description	Description of the Series. Value = Routine diagnostics measurement	ALWAYS	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

Tag	Type	VR	Name	Description	PoV	Source
>(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.	ANAP	MWL
>(0032,1060)	3	LO	Requested Procedure Description	Institution-generated administrative description or classification of Requested Procedure.	ANAP	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.	ANAP	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.	ANAP	MWL
>>(0008,0102)	1	SH	Coding Scheme Designator	See NEMA PS3.3 Section 8.2. Value = CZM-FORUM	ANAP	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.	ANAP	MWL
(0040,0253)	3	SH	Performed Procedure Step ID	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.	ALWAYS	AUTO
(0040,0244)	3	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started.	ALWAYS	AUTO

Tag	Type	VR	Name	Description	PoV	Source
(0040,0245)	3	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0254)	3	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed. Value = Routine diagnostics measurement	ALWAYS	AUTO

Table 8-20 Lensometry Measurements IOD - Module "Lensometry Measurements Series"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0060)	1	CS	Modality	Type of equipment that originally acquired the data used to create the images in this Series. Enumerated Values: LEN See NEMA PS3.3 Section C.7.3.1.1.1 for further explanation. Value = LEN	ALWAYS	AUTO

Table 8-21 Lensometry Measurements IOD - Module "Enhanced General Equipment"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0070)	1	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances.	ALWAYS	AUTO
(0008,1090)	1	LO	Manufacturer's Model Name	Manufacturer’s model name of the equipment that produced the composite instances: Carl Zeiss Meditec	ALWAYS	ACQUISITION
(0018,1000)	1	LO	Device Serial Number	Manufacturer’s serial number of the equipment that produced the composite instances.	ALWAYS	ACQUISITION
(0018,1020)	1	LO	Software Version(s)	Manufacturer’s designation of software version of the equipment that produced the composite instances. • FORUM Driver Version: 2.4.0.0 and higher versions of 2.x.y.z. • CZM NIM, 2.8.0 and higher versions of 2.x.y. • XML Schema Version connectivity interface 1.1.7 and higher versions of 1.x.y. • Serial Data Interface Definition of Modality 1.5.0 and higher versions of 1.x.y.	ALWAYS	AUTO

Table 8-22 Lensometry Measurements IOD - Module "General Ophthalmic Refractive Measurements"

Tag	Type	VR	Name	Description	PoV	Source
(0020,0013)	1	IS	Instance Number	A number that identifies these measurements.	ALWAYS	AUTO
(0008,0023)	1	DA	Content Date	The date the measurements data creation started.	ALWAYS	AUTO
(0008,0033)	1	TM	Content Time	The time the measurements data creation started.	ALWAYS	AUTO
(0020,4000)	3	LT	Image Comments	User-defined comments about this SOP Instance.	ALWAYS	AUTO

Table 8-23 Lensometry Measurements IOD - Module "Lensometry Measurements"

Tag	Type	VR	Name	Description	PoV	Source
(0046,0014)	1C	SQ	Right Lens Sequence	A sequence that specifies measurements of a patient's right lens. Required if the right lens is measured. Only a single Item shall be included in this sequence.	ANAP	ACQUISITION
>(0046,0146)	1	FD	Sphere Power	Refractive power of the lens that is the same in all meridians, measured at distance (optical infinity), in diopters.	ANAP	ACQUISITION
>(0046,0018)	1C	SQ	Cylinder Sequence	A sequence that specifies lens measurements to correct for astigmatism or measurements of an eye that has astigmatism. Required if astigmatic correction or astigmatism is measured. Only a single item shall be included in this sequence. Note: When astigmatism is present the power is NOT the same in all meridians, but has its minimum and maximum power in meridians separated by 90 degrees.	ANAP	ACQUISITION
>>(0046,0147)	1	FD	Cylinder Power	The power that is present at the power meridian (90 degrees from the axis), in diopters.	ANAP	ACQUISITION
>>(0022,0009)	1	FL	Cylinder Axis	The meridian, defined in degrees, that is 90 degrees from the power meridian.	ANAP	ACQUISITION
>(0046,0100)	1C	SQ	Add Near Sequence	A sequence that specifies refractive measurements of the lens to correct for inability to focus at near while wearing the distance prescription. Only a single item shall be included in this sequence. Required if Add Near is measured in the lens.	ANAP	ACQUISITION
>>(0046,0104)	1	FD	Add Power	Additional power relative to the distance correction, expressed in diopters, that allows best corrected visual acuity at the defined viewing distance.	ANAP	ACQUISITION
>(0046,0101)	1C	SQ	Add Intermediate Sequence	A sequence that specifies refractive measurements of the lens to correct for inability to focus at intermediate distance while wearing the distance prescription. Only a single item shall be included in this sequence. Required if Add intermediate is measured in the lens.	ANAP	ACQUISITION

Tag	Type	VR	Name	Description	PoV	Source
>>(0046,0104)	1	FD	Add Power	Additional power relative to the distance correction, expressed in diopters, that allows best corrected visual acuity at the defined viewing distance.	ANAP	ACQUISITION
>(0046,0028)	1C	SQ	Prism Sequence	A sequence that specifies prism that is measured in a lens, or that is required to correct for a patient's ocular misalignment. Required if prism is measured in the lens or if this part of a refraction is done for a patient. Only a single item shall be included in this sequence. Note: A prism is a wedge shaped lens that deviates light toward the base and shifts the apparent image toward its apex.	ANAP	ACQUISITION
>>(0046,0030)	1	FD	Horizontal Prism Power	The power of a prism to bend light in the horizontal direction, in prism diopters.	ANAP	ACQUISITION
>>(0046,0032)	1	CS	Horizontal Prism Base	Direction of the base of the measured prism -- either in (toward the nose), or out (away from the nose) Enumerated Value: IN OUT	ANAP	ACQUISITION
>>(0046,0034)	1	FD	Vertical Prism Power	The power of a prism to bend light in the vertical direction, in prism diopters.	ANAP	ACQUISITION
>>(0046,0036)	1	CS	Vertical Prism Base	Direction of the base of the measured prism -- either up, or down. Enumerated Value: UP DOWN	ANAP	ACQUISITION
(0046,0015)	1C	SQ	Left Lens Sequence	A sequence that specifies measurements of a patient's left lens. Required if the left lens is measured. Only a single Item shall be included in this sequence.	ANAP	ACQUISITION
>(0046,0146)	1	FD	Sphere Power	Refractive power of the lens that is the same in all meridians, measured at distance (optical infinity), in diopters.	ANAP	ACQUISITION
>(0046,0018)	1C	SQ	Cylinder Sequence	A sequence that specifies lens measurements to correct for astigmatism or measurements of an eye that has astigmatism. Required if astigmatic correction or astigmatism is measured. Only a single item shall be included in this sequence. Note: When astigmatism is present the power is NOT the same in all meridians, but has its minimum and maximum power in meridians separated by 90 degrees.	ANAP	ACQUISITION
>>(0046,0147)	1	FD	Cylinder Power	The power that is present at the power meridian (90 degrees from the axis), in diopters.	ANAP	ACQUISITION
>>(0022,0009)	1	FL	Cylinder Axis	The meridian, defined in degrees, that is 90 degrees from the power meridian.	ANAP	ACQUISITION
>(0046,0100)	1C	SQ	Add Near Sequence	A sequence that specifies refractive measurements of the lens to correct for inability to focus at near while wearing the distance prescription. Only a single item shall be included in this sequence. Required if Add Near is measured in the lens.	ANAP	ACQUISITION

Tag	Type	VR	Name	Description	PoV	Source
>>(0046,0104)	1	FD	Add Power	Additional power relative to the distance correction, expressed in diopters, that allows best corrected visual acuity at the defined viewing distance.	ANAP	ACQUISITION
>(0046,0101)	1C	SQ	Add Intermediate Sequence	A sequence that specifies refractive measurements of the lens to correct for inability to focus at intermediate distance while wearing the distance prescription. Only a single item shall be included in this sequence. Required if Add intermediate is measured in the lens.	ANAP	ACQUISITION
>>(0046,0104)	1	FD	Add Power	Additional power relative to the distance correction, expressed in diopters, that allows best corrected visual acuity at the defined viewing distance.	ANAP	ACQUISITION
>(0046,0028)	1C	SQ	Prism Sequence	A sequence that specifies prism that is measured in a lens, or that is required to correct for a patient's ocular misalignment. Required if prism is measured in the lens or if this part of a refraction is done for a patient. Only a single item shall be included in this sequence. Note: A prism is a wedge shaped lens that deviates light toward the base and shifts the apparent image toward its apex.	ANAP	ACQUISITION
>>(0046,0030)	1	FD	Horizontal Prism Power	The power of a prism to bend light in the horizontal direction, in prism diopters.	ANAP	ACQUISITION
>>(0046,0032)	1	CS	Horizontal Prism Base	Direction of the base of the measured prism -- either in (toward the nose), or out (away from the nose) Enumerated Value: IN OUT	ANAP	ACQUISITION
>>(0046,0034)	1	FD	Vertical Prism Power	The power of a prism to bend light in the vertical direction, in prism diopters.	ANAP	ACQUISITION
>>(0046,0036)	1	CS	Vertical Prism Base	Direction of the base of the measured prism -- either up, or down. Enumerated Value: UP DOWN	ANAP	ACQUISITION

Table 8-24 Lensometry Measurements IOD - Module "Visulens Lensometry Measurements "

Tag	Type	VR	Name	Description	PoV	Source
(2801,xx00)	3	SQ	Prescription Right Lens sequence	The fraction of UV - light light that passes through the measured lens optical media, in percent. Contains only one item.	ANAP	ACQUISITION
>(2801,xx02)	3	SQ	UV transmittance sequence	Contains 4 items, each item representing the UV transmittance measurement at a different wavelength (365 nm, 375 nm, 395 nm and 405 nm)	ANAP	ACQUISITION
>>(2801, xx03)	1	FD	UV Transmittance wave length	Wavelength in nm the UV transmittance is measured at.	ANAP	ACQUISITION

>>(2801, xx04))	1	FD	UV Transmittance	UV transmittance in percentage measured at the specified wavelength.	ANAP	ACQUISITION
(2801, xx01)	3	SQ	Presprition Left Lens sequence	The fraction of UV- light light that passes through the measured lens optical media, in percent. Contains only one item.	ANAP	ACQUISITION
>(2801, xx02)	3	SQ	UV transmittance sequence	Contains 4 items, each item representing the UV transmittance measurement at a different wavelength (365 nm, 375 nm, 395 nm and 405 nm)	ANAP	ACQUISITION
>>(2801, xx03)	1	FD	UV Transmittance wave length	Wavelength in nm the UV transmittance is measured at.	ANAP	ACQUISITION
>>(2801, xx04)	1	FD	UV Transmittance	UV transmittance in percentage measured at the specified wavelength.	ANAP	ACQUISITION

Table 8-25 Lensometry Measurements IOD - Module "Sop Common"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0016)	1	UI	SOP Class UID	Value = 1.2.840.10008.5.1.4.1.1.78.1	ALWAYS	CONFIG
(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	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

Tag	Type	VR	Name	Description	PoV	Source
(0008,0201)	3	SH	Timezone Offset From UTC	Contains the offset from UTC to the timezone for all DA and TM Attributes present in this SOP Instance, and for all DT Attributes present in this SOP Instance that do not contain an explicitly encoded timezone offset. Encoded as an ASCII string in the format "&ZZXX". The components of this string, from left to right, are & = "+" or "-", and ZZ = Hours and XX = Minutes of offset. Leading space characters shall not be present. The offset for UTC shall be +0000; -0000 shall not be used. Notes: 1. This encoding is the same as described in PS 3.5 for the offset component of the DT Value Representation. 2. This Attribute does not apply to values with a DT Value Representation, that contains an explicitly encoded timezone offset. 3. The corrected time may cross a 24 hour boundary. For example, if Local Time = 1.00 a.m. and Offset = +0200, then UTC = 11.00 p.m. (23.00) the day before. 4. The "+" sign may not be omitted. Time earlier than UTC is expressed as a negative offset. Note: For example: UTC = 5.00 a.m. Local Time = 3.00 a.m. Offset = -0200 The local timezone offset is undefined if this Attribute is absent.	ALWAYS	AUTO

8.1.1.4 Raw Data Information Object Definition (Intra Ocular Pressure)

IE	Module	Usage
Patient		
	Patient	ALWAYS
Study		
	General Study	ALWAYS
Series		
	General Series	ALWAYS
Equipment		
	General Equipment	ALWAYS
RawData		
	Acquisition Context	ALWAYS
	Raw Data	ALWAYS
	Non Contact Tonometry Measurements	ALWAYS
	Sop Common	ALWAYS

Table 8-26 Raw Data IOD - Module "Patient"

Tag	Type	VR	Name	Description	PoV	Source
(0010,0010)	2	PN	Patient's Name	Patient's full name.	ALWAYS	MWL, QR
(0010,0002)	2	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL, QR
(0010,0021)	3	LO	Issuer of Patient ID	The issuer of patient ID is mandatory and required. MWL and Query responses are rejected in case Issuer of Patient ID is empty.	ALWAYS	MWL, QR
(0010,0003)	2	DA	Patient's Birth Date	Birth date of the patient.	VNAP	MWL, QR
(0010,0004)	2	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	MWL, QR

Tag	Type	VR	Name	Description	PoV	Source
(0010,0216)	3	SH	Ethnic Group	Ethnic group or race of the patient.	ANAP	MWL, QR
(0010,0004)	3	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, QR

Table 8-27 Raw Data IOD - Module "General Study"

Tag	Type	VR	Name	Description	PoV	Source
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. ID-Root = 1.2.276.0.75.2	ALWAYS	AUTO
(0008,0002)	2	DA	Study Date	Date the Study started.	ALWAYS	ACQUISITION
(0008,0003)	2	TM	Study Time	Time the Study started.	ALWAYS	ACQUISITION
(0008,0009)	2	PN	Referring Physician's Name	Name of the patient's referring physician	VNAP	MWL
(0020,0001)	2	SH	Study ID	User or equipment generated Study identifier.	ALWAYS	MWL, AUTO
(0008,0005)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study.	VNAP	MWL
(0008,0103)	3	LO	Study Description	Institution-generated description or classification of the Study (component) performed.	ANAP	MWL
(0008,0111)	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.	ANAP	MWL
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance.	ANAP	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 Section 8.1.	ANAP	MWL
>(0008,0102)	1	SH	Coding Scheme Designator	See Section 8.2.	ANAP	MWL
>(0008,0103)	1C	SH	Coding Scheme Version	See 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 Section 8.3.	ANAP	MWL

Table 8-28 Raw Data IOD - Module "General Series"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0060)	1	CS	Modality	Type of equipment that originally acquired the data used to create the images in this Series. See C.7.3.1.1.1 for Defined Terms.	ALWAYS	AUTO
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series.	ALWAYS	AUTO
(0020,0011)	2	IS	Series Number	A number that identifies this Series.	ALWAYS	AUTO
(0020,0006)	2C	CS	Laterality	Laterality of (paired) body part examined. Required if the body part examined is a paired structure and Image Laterality (0020,0062) or Frame Laterality (0020,9072) are not sent. Enumerated Values: R = right L = left Note: Some IODs support Image Laterality (0020,0062) at the Image level or Frame Laterality(0020,9072) at the Frame level in the Frame Anatomy functional group macro or Measurement Laterality (0024,0113) at the Measurement level, which can provide a more comprehensive mechanism for specifying the laterality of the body part(s) being examined.	ALWAYS	AUTO
(0008,0021)	3	DA	Series Date	Date the Series started.	ALWAYS	AUTO
(0008,0031)	3	TM	Series Time	Time the Series started.	ALWAYS	AUTO
(0018,0103)	3	LO	Protocol Name	User-defined description of the conditions under which the Series was performed. Note: This attribute conveys series-specific protocol identification and may or may not be identical to the one presented in the Performed Protocol Code Sequence (0040,0260).	ALWAYS	AUTO
(0008,103E)	3	LO	Series Description	Description of the Series	ALWAYS	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.	ANAP	MWL
>(0032,1060)	3	LO	Requested Procedure Description	Institution-generated administrative description or classification of Requested Procedure.	ANAP	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.	ANAP	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 Section 8.1.	ANAP	MWL
>>(0008,0102)	1	SH	Coding Scheme Designator	See Section 8.2.	ANAP	MWL
>>(0008,0103)	1C	SH	Coding Scheme Version	See 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 Section 8.3.	ANAP	MWL
(0040,0253)	3	SH	Performed Procedure Step ID	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.	ALWAYS	AUTO
(0040,0244)	3	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0245)	3	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0254)	3	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed.	ALWAYS	AUTO

Table 8-29 Raw Data IOD - Module "General Equipment"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0007)	2	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances.	ALWAYS	AUTO
(0008,1090)	3	LO	Manufacturer's Model Name	Manufacturer’s model name of the equipment that produced the composite instances: Carl Zeiss Meditec	ALWAYS	ACQUISITION
(0018,0001)	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	ALWAYS	ACQUISITION

				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.		
(0018,0102)	3	LO	Software Version(s)	Manufacturer's designation of software version of the equipment that produced the composite instances. • FORUM Driver Version: 2.4.0.0 and higher versions of 2.x.y.z. • CZM NIM, 2.8.0 and higher versions of 2.x.y. • XML Schema Version connectivity interface 1.1.7 and higher versions of 1.x.y. • Serial Data Interface Definition of Modality 1.4.0 and higher versions of 1.x.y.	ALWAYS	AUTO

Table 8-30 Raw Data IOD - Module "Raw Data"

Tag	Type	VR	Name	Description	PoV	Source
(0020,0013)	2	IS	Instance Number	A number that identifies this raw data. The value shall be unique within a series.	ALWAYS	AUTO
(0008,0023)	1	DA	Content Date	The date the raw data creation was started.	ANAP	ACQUISITION
(0008,0033	1	TM	Content Time	The time the raw data creation was started.	ANAP	ACQUISITION
(0008,002A)	3	DT	Acquisition Datetime	The date and time that the acquisition of data started. Note: The synchronization of this time with an external clock is specified in the synchronization Module in Acquisition Time synchronized (0018,1800).	ANAP	ACQUISITION
(0020,0062)	3	CS	Image Laterality	Laterality of (possibly paired) body part examined. Enumerated Values: R = right L = left U = unpaired B = both left and right	ANAP	ACQUISITION
(0008,9123)	1	UI	Creator-Version UID	Unique identification of the equipment and version of the software that has created the Raw Data information. The UID allows one to avoid attempting to interpret raw data with an unknown format.	ALWAYS	AUTO

Table 8-31 Raw Data IOD - Module "Non Contact Tonometry Measurements"

Tag	Type	VR	Name	Description	PoV	Source
(2601, xx00)	1C	SQ	tonometry right eye sequence	A sequence that specifies tonometry measurements of a patient's right eye. Only a single Item shall be included in this sequence. Required if Image Laterality (0020,0062) is R or B.	ANAP	ACQUISITION

>(2601, xx02)	1	SQ	intraocular pressure sequence	Sequence of intraocular pressure measurements. Depends on the measurements taken. This sequence contains between one and four items.	ANAP	ACQUISITION
>>(2601, xx03)	1	FL	iop	Value of intraocular pressure in mmHg.	ANAP	ACQUISITION
>>(2601,xx04)	1	CS	iop suspicious	The value of intraocular pressure may be suspect. Enumerated values: YES, NO	ANAP	ACQUISITION
>(2601, xx05)	1	FL	average iop	Value of average intraocular pressure in mmHg.	ANAP	ACQUISITION
>(2601, xx06)	1	CS	average iop suspicious	The value of average intraocular pressure may be suspect. Enumerated values: YES, NO	ANAP	ACQUISITION
(2601, xx01)	1C	SQ	tonometry left eye sequence	A sequence that specifies tonometry measurements of a patient's left eye. Only a single Item shall be included in this sequence. Required if Image Laterality (0020,0062) is L or B.	ANAP	ACQUISITION
>(2601, xx02)	1	SQ	intraocular pressure sequence	Sequence of intraocular pressure measurements. Depends on the measurements taken. This sequence contains between one and four items.	ANAP	ACQUISITION
>>(2601,xx03)	1	FL	iop	Value of intraocular pressure in mmHg.	ANAP	ACQUISITION
>>(2601, xx04)	1	CS	iop suspicious	The value of intraocular pressure may be suspect. Enumerated values: YES, NO	ANAP	ACQUISITION
>(2601,xx05)	1	FL	average iop	Value of average intraocular pressure in mmHg.	ANAP	ACQUISITION
>(2601, xx06)	1	CS	average iop suspicious	The value of average intraocular pressure may be suspect. Enumerated values: YES, NO	ANAP	ACQUISITION

Table 8-32 Raw Data IOD - Module "Sop Common"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0016)	1	UI	SOP Class UID	Value = 1.2.840.10008.5.1.4.1.1.66	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. Value = Value = ISO_IR 192	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
(0008,0201)	3	SH	Timezone Offset From UTC	Contains the offset from UTC to the timezone for all DA and TM Attributes present in this SOP Instance, and for all DT Attributes	ALWAYS	AUTO

				present in this SOP Instance that do not contain an explicitly encoded timezone offset. Encoded as an ASCII string in the format "&ZZXX". The components of this string, from left to right, are & = "+" or "-", and ZZ = Hours and XX = Minutes of offset. Leading space characters shall not be present. The offset for UTC shall be +0000; -0000 shall not be used. Notes: 1. This encoding is the same as described in PS 3.5 for the offset component of the DT Value Representation. 2. This Attribute does not apply to values with a DT Value Representation, that contains an explicitly encoded timezone offset. 3. The corrected time may cross a 24 hour boundary. For example, if Local Time = 1.00 a.m. and Offset = +0200, then UTC = 11.00 p.m. (23.00) the day before. 4. The "+" sign may not be omitted. Time earlier than UTC is expressed as a negative offset. Note: For example: UTC = 5.00 a.m. Local Time = 3.00 a.m. Offset = -0200 The local timezone offset is undefined if this Attribute is absent.		

8.1.1.5 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 8-33 Encapsulated Pdf IOD - Module "Patient"

Tag	Type	VR	Name	Description	PoV	Source
(0010,0010)	2	PN	Patient's Name	Patient's full name.	ALWAYS	MWL, QR
(0010,0020)	2	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL, QR
(0010,0021)	3	LO	Issuer of Patient ID	The issuer of patient ID is mandatory and required. MWL and Query responses are rejected in case Issuer of Patient ID is empty.	ALWAYS	MWL, QR
(0010,0030)	2	DA	Patient's Birth Date	Birth date of the patient.	VNAP	MWL, QR
(0010,0040)	2	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	MWL, QR

(0010,1000)	3	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient.	VNAP	MWL, QR
(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, USER

Table 8-34 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. ID-Root = 1.2.276.0.75.2	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.	ALWAYS	AUTO, MWL
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study.	VNAP	MWL
(0008,1030)	3	LO	Study Description	Institution-generated description or classification of the Study (component) performed.	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 8-35 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. Note: SR may be an appropriate value for an Encapsulated CDA document with a structured XML Body.	ALWAYS	AUTO
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series.	ALWAYS	AUTO
(0020,0011)	1	IS	Series Number	A number that identifies the Series.	ALWAYS	AUTO
(0018,1030)	3	LO	Protocol Name	Description of the conditions under which the Series was performed. Value= Routine diagnostics measurement	ANAP	MWL, AUTO
(0008,103E)	3	LO	Series Description	Description of the Series	ALWAYS	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
(0040,0253)	3	SH	Performed Procedure	User or equipment generated identifier of that part of a Procedure that has been	ALWAYS	AUTO

			Step ID	carried out within this step.		
(0040,0244)	3	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0245)	3	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started.	ALWAYS	AUTO
(0040,0254)	3	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed. Copied from Requested Procedure Description.	ANAP	MWL

Table 8-36 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	AUTO
(0008,1090)	3	LO	Manufacturer's Model Name	Manufacturer’s model name of the equipment that produced the composite instances: Carl Zeiss Meditec	ALWAYS	ACQUISITION
(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. • FORUM Driver Version: 2.4.0.0 and higher versions of 2.x.y.z. • CZM NIM, 2.8.0 and higher versions of 2.x.y. • XML Schema Version connectivity interface 1.1.7 and higher versions of 1.x.y. • Serial Data Interface Definition of Modality Autorefraction Measurements: 1.6.0 and higher versions of 1.x.y. Keratometry Measurements: 1.6.0 and higher versions of 1.x.y Lensometry Measurements: 1.5.0 and higher versions of 1.x.y. Intra Ocular Pressure: 1.4.0 and higher versions of 1.x.y.	ALWAYS	CONFIG

Table 8-37 Encapsulated Pdf IOD - Module "Sc Equipment"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0064)	1	CS	Conversion Type	SYN = Synthetic Image	ALWAYS	AUTO

Table 8-38 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	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	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.	ALWAYS	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.	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.	ALWAYS	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	AUTO
(0042,0011)	1	OB	Encapsulated Document	Encapsulated Document stream, containing a document encoded according to the MIME Type.	ALWAYS	AUTO

Table 8-39 Encapsulated Pdf IOD - Module "Sop Common"

Tag	Type	VR	Name	Description	PoV	Source
(0008,0016)	1	UI	SOP Class UID	Value = 1.2.840.10008.5.1.4.1.1.104.1	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. Value = ISO_IR 192	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
(0008,0201)	3	SH	Timezone Offset From UTC	Contains the offset from UTC to the timezone for all DA and TM Attributes present in this SOP Instance, and for all DT Attributes present in this SOP Instance that do not contain an explicitly encoded timezone offset. Encoded as an ASCII string in the format "&ZZXX". The components of this string, from left to right, are & = "+" or "-", and ZZ = Hours and XX = Minutes of offset. Leading space characters shall not be present. The offset for UTC shall be +0000; -0000 shall not be used. Notes: 1. This encoding is the same as described in PS 3.5 for the offset component of the DT Value Representation. 2. This Attribute does not apply to values with a DT Value Representation, that contains an explicitly encoded timezone offset. 3. The corrected time may cross a 24 hour boundary. For example, if Local Time = 1.00 a.m. and Offset = +0200, then UTC = 11.00 p.m.	ALWAYS	AUTO

				(23.00) the day before. 4. The "+" sign may not be omitted. Time earlier than UTC is expressed as a negative offset. Note: For example: UTC = 5.00 a.m. Local Time = 3.00 a.m. Offset = -0200 The local timezone offset is undefined if this Attribute is absent.		

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.

The case of patient data collision is outlined in chapter of Study Root Query/Retrieve SOP Class.

8.1.3 Attribute Mapping

In scheduled case, the following attributes are mapped from Modality Worklist.

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
(0010,4000)	Patient Comments	(0010,4000)	Patient Comments	No
(0008,0050)	Accession Number	(0008,0050)	Accession Number	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
		(0018,1030)	Protocol Name	No
		(0040,0254)	Performed Procedure Step 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

Modality Worklist		Instance IOD		Editable
>(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 4.2.1.3.2 Activity – Query Modality Worklist. Other attributes get lost and are not available in the VISUCONNECT 500 Software.

8.2 Data Dictionary of Private Attributes

Group ID: 2801
Private Creator String: “99CZM_VISULENS_LensometryMeasurements”
Occurs in: LensometryMeasurements SOP Instance

Attribute Name	Element ID	VR	VM
Prescription Left Lens Sequence	00	SQ	1
Prescription Right Lens Sequence	01	SQ	1
UV transmittance Sequence	02	SQ	1
UV transmittance wavelength	03	FD	1
UV transmittance	04	FD	1

Group ID: 2601
Private Creator String: “99CZM_VISUPLAN_NonContactTonometry”
Occurs in: Non Contact Tonometry Measurements

Attribute Name	Element ID	VR	VM
Tonometry Right Eye Sequence	00	SQ	1
Tonometry Left Eye Sequence	01	SQ	1
Intraocular Pressure Sequence	02	SQ	1
IOP	03	FL	1
IOP Suspicious	04	CS	1
Average IOP	05	FL	1
Average IOP Suspicious	06	CS	1

8.3 Coded Terminology and Templates

Not applicable.

8.4 Greyscale Image Consistency

Not applicable.

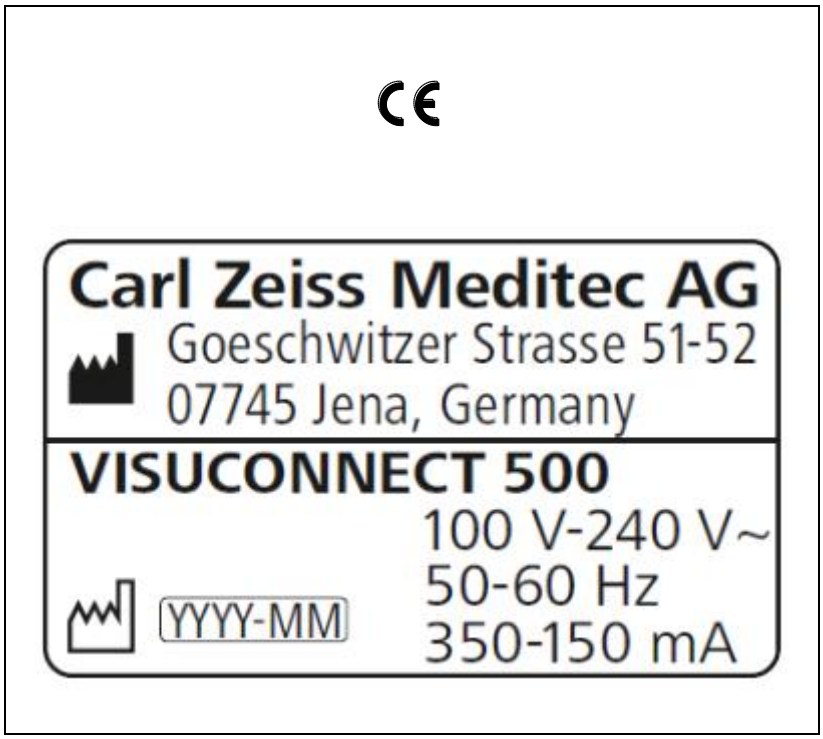
8.5 Standard Extended / Specialized/ Private SOP Classes

Table 8-31 Raw Data IOD - Module "Non Contact Tonometry Measurements”
Table 8-24 Lensometry Measurements IOD - Module “Visulens Lensometry Measurements "

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:



www.zeiss.com/dicom
www.zeiss.com/med