CARL ZEISS MEDITEC

DICOM Conformance Statement

IOLMaster® 500

Version 7.5

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1 Conformance Statement Overview

The IOLMaster 500 application is dedicated to lowhassle biometry and high-confidence IOL selection. Designed for robustness, reliability and exceptional system integrity, the IOLMaster 500 offers a wide range of built-in IOL power calculation options, including the latest Haigis and Holladay 2 formulas.
The IOLMaster 500 application allows to:

- Query for modality worklist
- Export evidence reports and sclera images

The IOLMaster 500 AE supports several DICOM Services as Service Class User such as Verification, Encapsulated PDF Storage, Ophthalmic Photography 8Bit Image Storage and Multi-frame True Color Secondary Capture Image Storage.

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

Table 1-1 Network Services Supported

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Encapsulated PDF Storage	Yes	No
Ophthalmic Photography 8 Bit Image Storage	Yes	No
Multi-frame True Color Secondary Capture Image Storage	Yes	No
Workflow Management		
Modality Worklist Information Model – FIND	Yes	No

The IOLMaster 500 does not support Media Interchange.

Possible combinations of DICOM Service Providers for IOLMaster 500 as acquisition modality:

Modality Worklist SCP	Encapsulated PDF Storage	MF True Color SC Stroage	Ophthalmic Photography Image Storage
X			
X	X		X
	X		X
X		X	X
		X	X

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3 Introduction

3.1 Revision History

Document Version	Author	Date	NB Version	Comment
1.0	mshnau	09.01.2012	1.3.7	
1.1	x1caf	16.12.2013	1.3.7	Added attribute name to data dictionary in chapter 8.2 Added information on Private Modules in chapter 8.1 (0020,000D) Source corrected

3.2 Audience

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

3.3 Remarks

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

3.4 Definitions, Terms and Abbreviations

Table 3-1 Abbreviations

Abbreviation	Definition
AE	Application Entity
AET	Application Entity Title
DICOM	Digital Imaging and Communications in Medicine
ILE	Implicit Little Endian
IOD	Information Object Definition
JPG-1	JPEG Coding Process 1; JPEG Baseline; ISO 10918-1
MWL	Modality Work List
NB	Network Broker
RLE	Run Length Encoding
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair, pair of user and provider.
TCP/IP	Transmission Control Protocol / Internet Protocol
UID	Unique Identifier
VL	Visible Light
ePDF	Encapsulated PDF
MF-SC	Multiframe True Color Secondary Capture

3.5 References

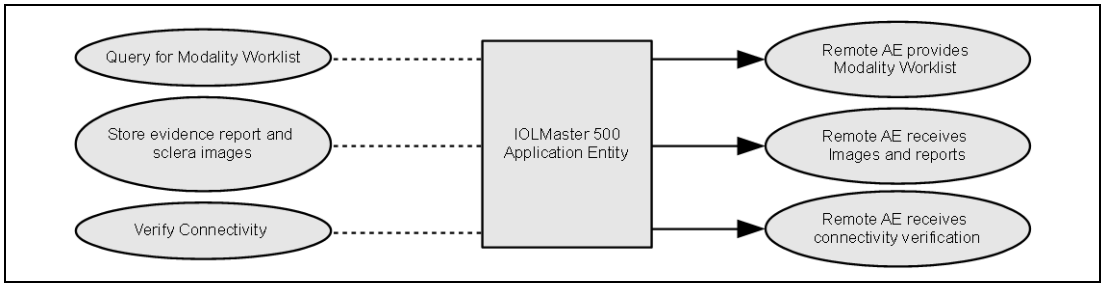
NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at http://medical.nema.org/)

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



4.1.2 Functional Definition Of AEs

4.1.2.1 Functional Definition of IOLMaster 500

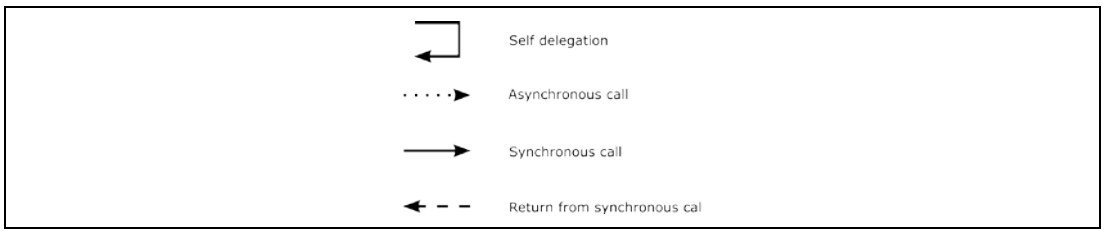
The IOLMaster 500 application is dedicated to lowhassle biometry and high-confidence IOL selection. Designed for robustness, reliability and exceptional system integrity, the IOLMaster 500 offers a wide range of built-in IOL power calculation options, including the latest Haigis and Holladay 2 formulas.
The IOLMaster 500 application allows to:

- Query for modality worklist
- Export evidence reports and sclera images

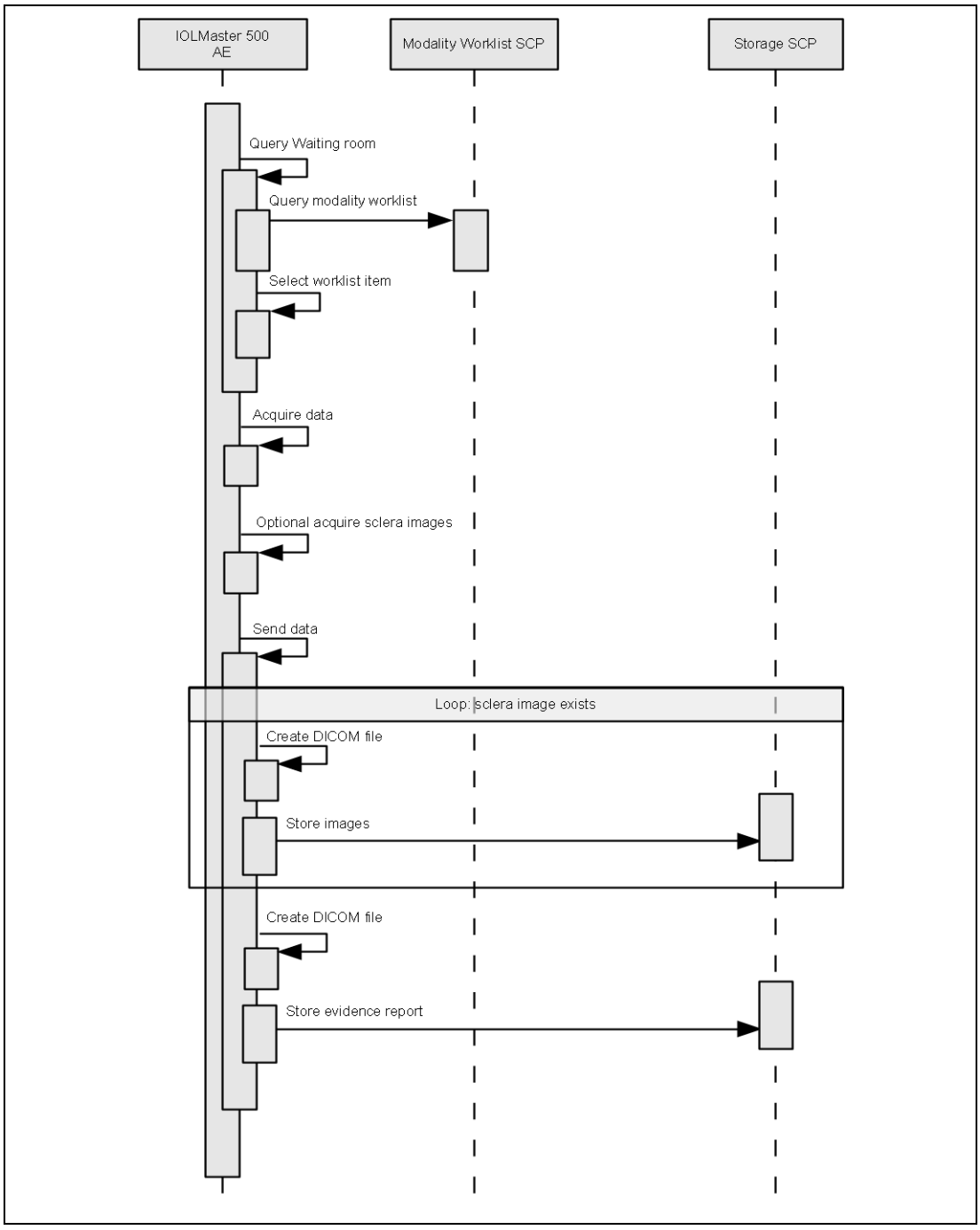
The IOLMaster 500 AE supports several DICOM Services as Service Class User such as Verification, Encapsulated PDF, Ophthalmic Photography 8Bit Image Storage and Multi-frame True Color Secondary Capture Image Storage.
The IOLMaster 500 application logs extensive information about the DICOM operations 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 uses 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.



All activities are initiated by an operator.

Query Modality Worklist

When the patient arrives at the IOLMaster 500, then the operator queries the worklist. He types in search criteria and gets matches back. Those matches are listed in a table, so the operator can select the correct entry. According to the transferred data IOLMaster 500 creates an entry in the local database (Patient, Study, Visit for the current day). Procedure Step related information is kept temporary in the IOLMaster 500 application.
The operator can now select the patient for data acquisition.

Acquire data

The operator acquires data from patient's eye. Optionally he can switch to Reference Image Capture mode (sclera image) and acquire sclera images with green led illumination.

Send data

The operator can trigger this activity by selecting the send button from the menu.

4.2 AE Specifications

4.2.1 Network Broker Application Entity Specification

4.2.1.1 SOP Classes

Table 4-1 SOP Classes for IOLMaster 500 AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	No
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	No

4.2.1.2 Associations Policies

4.2.1.2.1 General

DICOM standard Application Context Name is DICOM 3.0.

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 results in two since the activities “Query Modality Worklist” and “Store Images” can run in parallel.

Table 4-3 Number of associations

Maximum number of simultaneous associations	2

4.2.1.2.3 Asynchronous Nature

IOLMaster 500 does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.1.2.4 Implementation Identifying Information

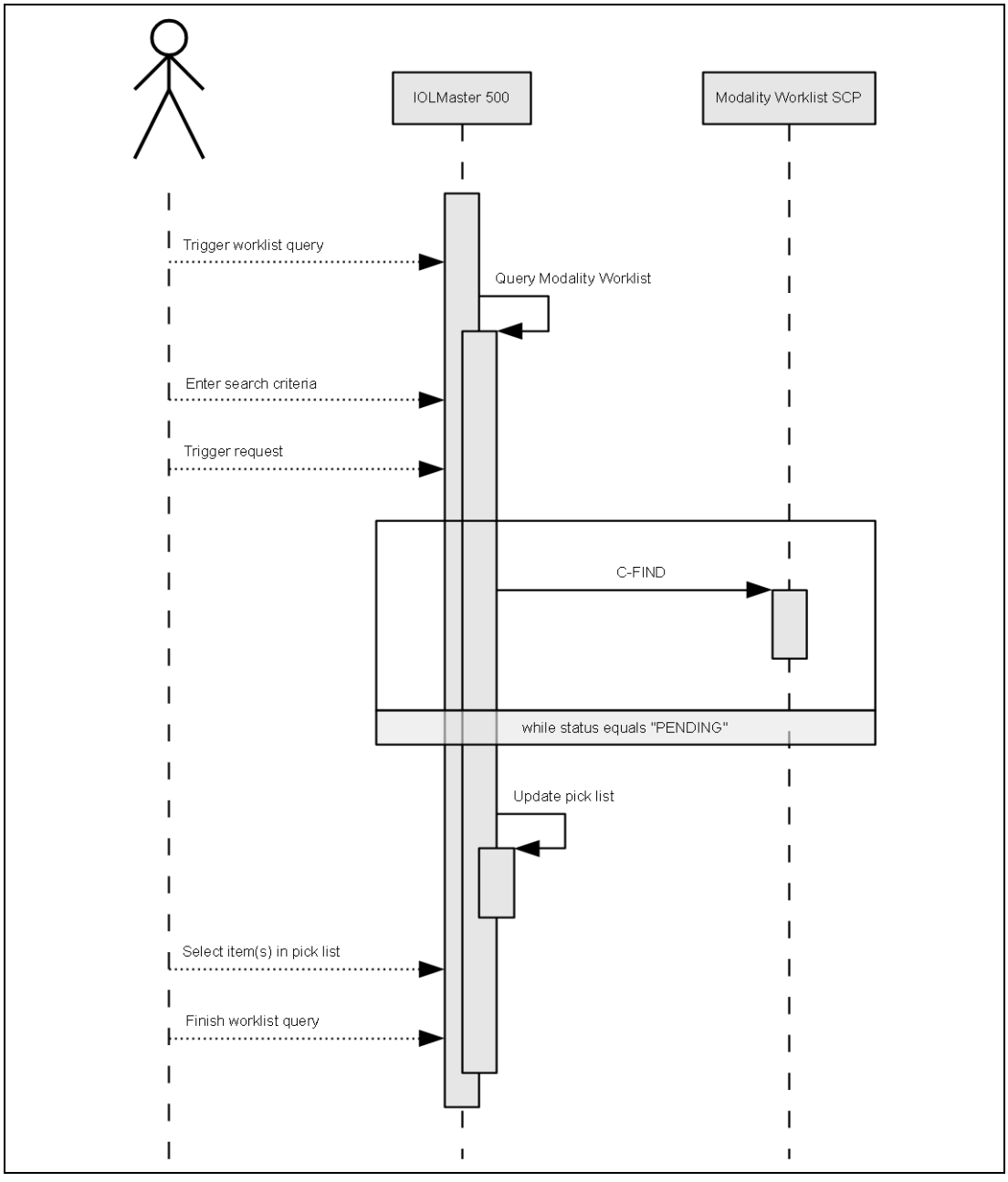
Table 4-4 DICOM Implementation class and version

Implementation Class UID	**1.2.276.0.75.2.5.10**
Implementation Version Name	1.3.7.1025

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Query Modality Worklist

4.2.1.3.1.1 Description and Sequencing of Activities



The activity “Query Modality Worklist” can be triggered at any time during the session by an operator. It is meaningful to perform the query when the patient arrives at the modality, then the worklist contains most recent information.
After activating the worklist query, the operator can fill in search criteria in the shown dialog. For instance, incomplete patient information can be used. The operator triggers the search when he or her filled in search criteria. The IOLMaster 500 sends a DICOM request, containing the search criteria and waits for the response from the partner Application Entity. After receiving the response, the pick list is updated with the information included in the response. The pick list instantly shows the received information. The application will wait for additional responses as long as the Worklist Provider sends a status of “pending”.
After receiving all responses, the operator can select up to a certain number of items to create a new visit for. The number of selectable items can be configured. The operator finally finishes the worklist query by confirming the selection.

The IOLMaster 500 application takes over the selected items. It prepares data according to the selected items. For patients who relate to existing data sets of the local database, the IOLMaster 500 application asks the operator to update or to keep the existing information. For all others the IOLMaster 500 application creates new data sets. After importing the Modality Worklist information, the operator can start the examination and acquire data for those studies.

4.2.1.3.1.2 Proposed Presentation Contexts

Table 4-5 Presentation Context proposed by IOLMaster 500 AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	ILE	1.2.840.10008.1.2	SCU	No

4.2.1.3.1.3 SOP Specific Conformance for Modality Worklist SOP Class

Table 4-6 Modality Worklist C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The IOLMaster 500 finishes receiving worklist items. The user can select items in pick list.
Pending	Matches are continuing	FF00, FF01	IOLMaster 500 lists received worklist item in the pick list.
*	*	Any other status code	The status label of the dialog shows an error message.

The following table shows all attributes included in a Modality Worklist C-FIND-RQ data set. The column “Query key editable by operator” specifies whether the attribute can be used as matching key attribute. The columns “Imported in App from MWL” and “Displayed in App” indicate whether the attribute values are imported into the IOLMaster 500 application to be reused by the application at a later point in time. Only very few attributes are editable via the IOLMaster 500 application user interface, see column “Editable”. The last column “Exported in Image IOD” specifies which attribute values are copied from the Modality Worklist C-FIND-RSP data set into the Image or ePDF IOD exported to the DICOM Storage Provider.

Table 4-7 Attributes involved in Modality Worklist C-FIND request and response

Tags	Tag Name	Query key, editable by operator	Imported in App from MWL	Displayed in App	Editable	Exported in ImageIOD
Patient						
(0008,1120)	Referenced Patient Sequence					
>(0008,1150)	Referenced SOP Class UID					
>(0008,1155)	Referenced SOP Instance UID					
(0010,0010)	Patient’s Name	Y	Y	Y		Y
(0010,0020)	Patient ID	Y	Y	Y		Y
(0010,0021)	Issuer Of Patient ID		Y			Y
(0010,0030)	Patients Birth Date		Y	Y		Y
(0010,0032)	Patients Birth Time					
(0010,0040)	Patients Sex		Y	Y		Y
(0010,1000)	Other Patient IDs		Y			Y
(0010,1001)	Other Patient Names					
(0010,1030)	Patient’s Weight					
(0010,2000)	Medical Alerts					
(0010,2110)	Allergies					
(0010,2160)	Ethnic Group		Y			
(0010,21C0)	Pregnancy Status					
(0010,4000)	Patient Comments		Y	Y	Y	Y
(0038,0010)	Admission ID					
(0038,0050)	Special Needs					
(0038,0300)	Current Patient Location					
(0038,0500)	Patient State					
(0040,3001)	Confidentiality Constraint on Patient Data Description					
Study						
(0008,0050)	Accession Number	Y	Y	Y		Y

(0008,0090)	Referring Physicians Name		Y			Y
(0020,000D)	Study Instance UID		Y			Y
(0032,1032)	Requesting Physician					
(0032,4000)	Study Comments					
Requested Procedure						
(0008,1110)	Referenced Study Sequence		Y[1]			Y
>(0008,1150)	Referenced SOP Class UID		Y			Y
>(0008,1155)	Referenced SOP Instance UID		Y			Y
(0032,1060)	Requested Procedure Description					
(0032,1064)	Requested Procedure Code Sequence					
>(0008,0100)	Code Value					
>(0008,0102)	Coding Scheme Designator					
>(0008,0103)	Coding Scheme Version					
>(0008,0104)	Code Meaning					
(0040,1001)	Requested Procedure ID	Y	Y	Y		Y
(0040,1003)	Requested Procedure Priority					
(0040,1004)	Patient Transport Arrangements					
Imaging Service Request						
(0040,2016)	Placer Order Number / Imaging Service Request					
Scheduled Procedure Step (SPS)						
(0040,0100)	Scheduled Procedure Step Sequence					
>(0008,0060)	Modality	Y	Y			
>(0032,1070)	Requested Contrast Agent					
>(0040,0001)	Scheduled Station Application Entity Title	Y	Y			
>(0040,0002)	Scheduled Procedure Step Start Date	Y	Y			
>(0040,0003)	Scheduled Procedure Step Start Time					
>(0040,0006)	Scheduled Performing Physician's Name					
>(0040,0007)	Scheduled Procedure Step Description		Y			Y
>(0040,0008)	Scheduled Protocol Code Sequence					
>>(0008,0100)	Code Value					
>>(0008,0102)	Coding Scheme Designator					
>>(0008,0103)	Coding Scheme Version					
>>(0008,0104)	Code Meaning					
>(0040,0009)	Scheduled Procedure Step ID		Y			Y
>(0040,0010)	Scheduled Station Name					
>(0040,0011)	Scheduled Procedure Step Location					
>(0040,0012)	Pre-Medication					
>(0040,0020)	Scheduled Procedure Step Status					

The operator can fill in search criteria as query keys. IOLMaster 500 offers two approaches: Patient Based and Broad Query.
Following tags are editable as search criteria in "Patient Based Query".

Table 4-8 Modality Worklist query key details – Patient Based Query

Tag	Description
(0010,0010)	Patients Name
(0010,0020)	Patient ID
(0008,0050)	Accession Number
(0040,1001)	Requested Procedure ID

Following tags are editable as search criteria in "Broad Query".

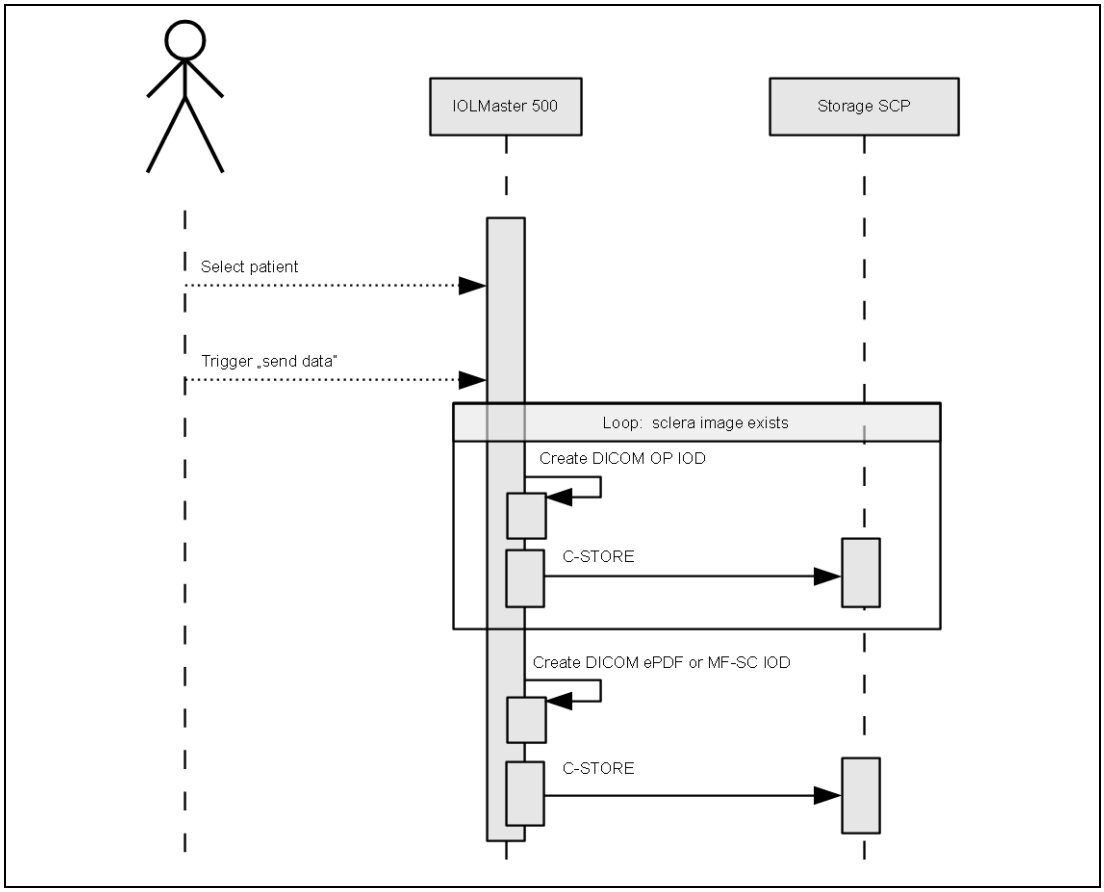
Table 4-9 Modality Worklist query key details – Broad Query

Tag	Description
(0040,0100)	Scheduled Procedure Step Sequence
>(0040,0002)	Scheduled Procedure Step Start Date The default value is today's date.
>(0008,0060)	Modality The default value is empty.
>(0040,0001)	Scheduled Station AE Title The default value is set by configuration.

[1] Imports first item in sequence only.

4.2.1.3.2 Activity – Send data

4.2.1.3.2.1 Description and Sequencing of Activities



After finishing the examination, the whole Study can be submitted. The operator can initiate sending evidence reports and sclera images at any time to storage entities.
The IOLMaster 500 application creates one send-job per DICOM object. Those jobs are queued and can be monitored in a dialog. The transmission of the DICOM objects is processed in the background (that means it is performed while operator can continue work with IOLMaster 500 application). The operator can even control the storage progress. It's up to the operator if the storage progress dialog is visible or not.

4.2.1.3.2.2 Proposed Presentation Contexts

Table 4-10 Proposed Presentation Contexts by the IOLMaster 500 AE

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Multi-frame True Color SC Image Storage	1.2.840.10008.5.1.4.1.1.7.4	ILE	1.2.840.10008.1.2	SCU	No
		JPG-1	1.2.840.10008.1.2.4.50	SCU	No
		RLE	1.2.840.10008.1.2.5	SCU	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	ILE	1.2.840.10008.1.2	SCU	No
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	JPG-1	1.2.840.10008.1.2.4.50	SCU	No

4.2.1.3.2.3 SOP Specific Conformance for Image Storage SOP Class

Table 4-11 Storage C-STORE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The belonging job gets a success state and will be removed from list.

*	*	Any other status code	The job gets an error state.

4.2.1.4 Association Acceptance Policy

The Network Broker does not accept Associations.

4.3 Network Interfaces

4.3.1 Physical Network Interface

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

4.3.2 Additional Protocols

No additional protocols are supported.

4.4 Configuration

4.4.1 AE Title/Presentation Address Mapping

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

4.4.1.1 Local AE Titles

The IP address and the calling AE Title is configurable via IOLMaster 500 Settings Dailog (network tab). To change the IP address the administrator clicks the button “Change network settings”. The calling AE-Title can be changed by clicking on the button “Broker configuration” to start the Network Broker configuration tool.

4.4.1.2 Remote AE Titles

The mapping of external AE Titles to TCP/IP addresses and ports is configurable. The Network Broker configuration tool allows to set up one AE as Modality Worklist Provider and one AE as Storage Provider. For both AEs, the host name or IP address, the port and the Application Entity Title must be known.

4.4.2 Parameters

4.4.2.1 General Parameters

4.4.2.2 Modality Worklist SCU Parameters

The socket timeout is configurable within a range of 10 – 60 seconds. Default is 10 seconds.

4.4.2.3 Storage SCU Parameters

The socket timeout is configurable within a range of 10 – 60 seconds. Default is 10 seconds.

For Multiframe True Color Secondary Capture Image Storage it is possible to activate RLE image compression.

Possible compressions for the IODs supported by IOLMaster 500 are the following:

- Multi-frame True Color Secondary Capture
  - No Compression
  - RLE Compression
- Encapsulated PDF
  - No selection possible
- Ophthalmic Photography 8 Bit
  - No selection possible

5 Media Interchange

Media Interchange is not scope of this document since Media Interchange is not supported by IOLMaster 500.

6 Support Of Character Sets

In addition to the default character repertoire, the Defined Terms for Specific Character Set listed in the table hereafter are supported.

Table 6-1 Supported Character Set

Character Set Description	Defined Term
Latin alphabet No. 1	ISO_IR 100

7 Security

The DICOM capabilities of the IOLMaster 500 application do not support any specific security measures. It is assumed that IOLMaster 500 application 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 IOLMaster 500 application.
- Firewall or router protections to ensure that IOLMaster 500 application 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)

The rows of not supported modules or tags are grey.

Abbreviations used for presence of values (PoV)	
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 (Source)	
USER	Attribute value source is from user input
AUTO	Attribute value is generated automatically
MWL, MPPS, etc.	Attribute value is the same as the value received using a DICOM service such as Modality Worklist, Modality Performed Procedure Step, etc.
CONFIG	Attribute value source is a configurable parameter

8.1.1.1 Encapsulated PDF Information Object Definition

IE	Module	Usage
Patient		
	Patient	MANDATORY
Study		
	GeneralStudy	MANDATORY
Series		
	EncapsulatedDocumentSeries	MANDATORY
Equipment		
	GeneralEquipment	MANDATORY
	ScEquipment	MANDATORY
EncapsulatedDocument		
	EncapsulatedDocument	MANDATORY
	SopCommon	MANDATORY
	CzmEncapsulatedPdfInstanceExtension	OPTIONAL
	IOL_Measured_Values	OPTIONAL
	IOL_Formula	OPTIONAL
	IOL_Multi_Formula	OPTIONAL
	IOL_Haigis-L	OPTIONAL
	IOL_phake IOL	OPTIONAL
	IOL_Lens_Database	OPTIONAL

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

Patient						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0010,0010)	2	PN	Patient's Name	Patient's full name.	VNAP	MWL, USER
(0010,0020)	2	LO	Patient ID	Primary hospital identification number or code for the patient.	VNAP	MWL, USER
(0010,0021)	3	LO	Issuer of Patient ID	Identifier of the Assigning Authority (system, organization, agency, or department) that issued the Patient ID. Note: Equivalent to HL7 v2 CX component 4	ANAP	MWL

				subcomponent 1.		
(0010,0030)	2	DA	Patient's Birth Date	Birth date of the patient.	VNAP	MWL, USER
(0010,0040)	2	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	MWL, USER
(0010,1000)	3	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient.	VNAP	MWL
(0010,4000)	3	LT	Patient Comments	User-defined additional information about the patient.	VNAP	MWL, USER

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

GeneralStudy						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. In the unscheduled case IOLMaster 500 uses a constant prefix of “1.2.276.0.75.2.1.10.0.1.” followed by a date/time stamp and machine specific identifier. In the scheduled case the value is copied from the Modality Worklist.	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	Equipment generated Study identifier.	ALWAYS	AUTO
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study. Value does not exist in the unscheduled case.	VNAP	MWL
(0008,1110)	3	SQ	Referenced Study Sequence	A sequence that provides reference to a Study SOP Class/Instance pair. The IOLMaster 500 only supports one item in the 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

Table 8-3 Encapsulated PDF IOD - Module "Encapsulated Document Serie"

EncapsulatedDocumentSeries						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0060)	1	CS	Modality	“OT”	ALWAYS	AUTO
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series. IOLMaster 500 uses a constant prefix of “1.2.276.0.75.2.1.10.0.2.” followed by a date/time stamp and machine specific identifier.	ALWAYS	AUTO
(0020,0011)	1	IS	Series Number	A number that identifies the Series. Series Number is always “0”.	ALWAYS	AUTO
(0040,0275)	3	SQ	Request Attributes Sequence	Sequence that contains attributes from the Imaging Service Request. IOLMaster 500 only supports one item in this sequence. Sequence is only included in the scheduled case.	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. Attribute is only included in the scheduled case.	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. Attribute is only included in the scheduled case.	ANAP	MWL
>(0040,0007)	3	LO	Scheduled Procedure Step Description	Institution-generated description or classification of the Scheduled Procedure Step to be performed. Attribute is only included in the scheduled case.	ANAP	MWL

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

GeneralEquipment						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0070)	2	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances. Always “Carl Zeiss Meditec”.	ALWAYS	AUTO
(0008,1010)	3	SH	Station Name	User defined name identifying the machine that produced the composite instances. Always the hostname configured via IOLMaster 500 settings dialog.	ALWAYS	CONFIG
(0008,1090)	3	LO	Manufacturer's Model Name	Manufacturer’s model name of the equipment that produced the composite instances. Always “IOLMaster 500”.	ALWAYS	AUTO
(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	AUTO
(0018,1020)	3	LO	Software Version(s)	Manufacturer’s designation of software version of the equipment that produced the composite instances. Always „7.5.2.0076“.	ALWAYS	AUTO

Table 8-5 Encapsulated PDF IOD - Module "SC Equipment"

ScEquipment						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0064)	1	CS	Conversion Type	Describes the kind of image conversion. Defined Terms : DV = Digitized Video DI = Digital Interface DF =	ALWAYS	AUTO

				Digitized Film WSD = Workstation SD = Scanned Document SI = Scanned Image DRW = Drawing SYN = Synthetic Image. Always “SYN”.		

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

EncapsulatedDocument						
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. The instance number is always “1”.	ALWAYS	AUTO
(0008,0023)	2	DA	Content Date	The date the document content creation was started.	ALWAYS	AUTO
(0008,0033)	2	TM	Content Time	The time the document content creation was started.	ALWAYS	AUTO
(0008,002A)	2	DT	Acquisition Datetime	The date and time that the original generation of the data in the document started.	ALWAYS	AUTO
(0028,0301)	1	CS	Burned In Annotation	Indicates whether or not the encapsulated document contains sufficient burned in annotation to identify the patient and date the data was acquired. Enumerated Values: YES NO Identification of patient and date as text in an encapsulated document (e.g., in an XML attribute or element) is equivalent to "burned in annotation". A de-identified document may use the value NO. Always „YES“.	ALWAYS	AUTO
(0042,0010)	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 “IOLMaster Report”.	ALWAYS	AUTO
(0040,A043)	2	SQ	Concept Name Code Sequence	A coded representation of the document title. Always an empty sequence.	EMPTY	AUTO
(0042,0012)	1	LO	MIME Type of Encapsulated Document	The type of the encapsulated document stream described using the MIME Media Type (see RFC 2046). Always “application/pdf”.	ALWAYS	AUTO
(0042,0011)	1	OB	Encapsulated Document	Encapsulated Document stream, containing a document encoded according to the MIME Type.	ALWAYS	AUTO

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

SopCommon						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0016)	1	UI	SOP Class UID	Uniquely identifies the SOP Class. Always „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. IOLMaster 500 uses a constant prefix of „1.2.276.0.75.2.1.10.0.3.“ followed by a date/time stamp and machine specific identifier.	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. Always „ISO_IR 100“.	ALWAYS	AUTO
(0008,0012)	3	DA	Instance Creation	Date the SOP Instance was created.	ALWAYS	AUTO

			Date			
(0008,0013)	3	TM	Instance Creation Time	Time the SOP Instance was created.	ALWAYS	AUTO

Table 8-8 Encapsulated PDF IOD - Module "CMZ Encapsulated PDF Instance Extension"

CzmEncapsulatedPdfInstanceExtension						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,1140)	3	SQ	Referenced Image Sequence	References images that are important for IOLs. The sequence may contain zero, one or more items. Only present if reference sclera image acquisition has been performed. References OP dataset containing scleral images.	ANAP	AUTO
>(0008,1150)	1	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class. Always “1.2.840.10008.5.1.4.1.1.77.1.5.1”.	ANAP	AUTO
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance. SOP Instance UID of the referenced OP dataset.	ANAP	AUTO
>(0040,A170)	3	SQ	Purpose of Reference Code Sequence	CZM specified items are (99CZM, SCLERAL_IMG_L, "Image of patient’s left eye's scleral vessels."), (99CZM, SCLERAL_IMG_R, "Image of patient’s right eye's scleral vessels.")	ANAP	AUTO
>>(0008,0100)	1	SH	Code Value	SCLERAL_IMG_L or SCLERAL_IMG_R depending on the eye examined.	ANAP	AUTO
>>(0008,0102)	1	SH	Coding Scheme Designator	99CZM	ANAP	AUTO
>>(0008,0104)	1	LO	Code Meaning	"Image of patient’s left eye's scleral vessels." or "Image of patient’s right eye's scleral vessels." Depending on the eye examined.	ANAP	AUTO

Table 8-9 Encapsulated PDF IOD - Module "IOL_Measured_Values"

Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(771B,xx30)	3	SQ	axial_length_values_sequence	Sequence of axial length values measured for one eye, may contain one ore two items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx31)	3	SQ	axial_length_values_triple_sequence	Sequence of single axial length measurements, may contain up to 20 items	ALWAYS	AUTO
>>(771B,xx0B)	3	FD	al	Axial length optical (single measurement) [mm]	ALWAYS	AUTO
>>(771B,xx0C)	3	FD	snr	Signal to noise ratio (single measurement)	ALWAYS	AUTO
>>(771B,xx0D)	3	FD	index_tag	Index of single measurement	ALWAYS	AUTO
>(771B,xx43)	3	FD	mean_value_al	Axial length optical (composite value) [mm]	ALWAYS	AUTO
>(771B,xx44)	3	FD	mean_value_snr	Signal to noise ratio (composite value)	ALWAYS	AUTO
(771B,xx32)	3	SQ	keratometer_values_sequence	Sequence of keratometry values measured for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx33)	3	SQ	keratometer_values_ntupel_sequence	Sequence of single keratometry measurements, may contain up to 3 items	ALWAYS	AUTO
>>(771B,xx0F)	3	FD	r1	Corneal radius of curvature of flat meridian [mm]	ALWAYS	AUTO
>>(771B,xx11)	3	FD	d1	Corneal refractive power of flat meridian [dpt]	ALWAYS	AUTO

>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>(771B,xx10)	3	FD	r2	Corneal radius of curvature of steep meridian [mm]	ALWAYS	AUTO
>>(771B,xx12)	3	FD	d2	Corneal refractive power of steep meridian [dpt]	ALWAYS	AUTO
>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO
>>(771B,xx15)	3	FD	zyl	Difference between steep and flat keratometric power [dpt]	ALWAYS	AUTO
>(771B,xx16)	3	FD	refractive_index	Refractive index corneal power is based on	ALWAYS	AUTO
>(771B,xx17)	3	FD	quali_tag	Standard deviation in series of measurements	ALWAYS	AUTO
>(771B,xx49)	3	FD	mean_value_r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>(771B,xx4A)	3	FD	mean_value_d1	Mean value of power in flat meridian [dpt]	ALWAYS	AUTO
>(771B,xx4B)	3	FD	mean_value_a1	Mean value of axis of flat meridian [°]	ALWAYS	AUTO
>(771B,xx4C)	3	FD	mean_value_r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>(771B,xx4D)	3	FD	mean_value_d2	Mean value of power in steep meridian [dpt]	ALWAYS	AUTO
>(771B,xx4E)	3	FD	mean_value_a2	Mean value of axis of steep meridian [°]	ALWAYS	AUTO
>(771B,xx4F)	3	FD	mean_value_zyl	Mean value of difference between steep and flat keratometric power [dpt]	ALWAYS	AUTO
(771B,xx34)	3	SQ	chamber_depth_values_sequence	Sequence of anterior chamber depth values measured for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx18)	3	FD	num1	Measurement 1 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx19)	3	FD	num2	Measurement 2 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx1A)	3	FD	num3	Measurement 3 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx1B)	3	FD	num4	Measurement 4 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx1C)	3	FD	num5	Measurement 5 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx0E)	3	FD	mean_value	Mean value of anterior chamber depth [mm]	ALWAYS	AUTO
(771B,xx35)	3	SQ	white_to_white_sequence	Sequence of white-to-white values measured for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx3B)	3	SQ	white_to_white_values_sequence	Sequence of single white-to-white measurements, may contain up to 3 items	ALWAYS	AUTO
>>(771B,xx1D)	3	FD	wzw	White-to-white diameter [mm]	ALWAYS	AUTO
>>(771B,xx1E)	3	FD	fpx	Horizontal white-to-white offset to visual axis (x-coordinate) [mm]	ALWAYS	AUTO
>>(771B,xx1F)	3	FD	fpy	Vertical white-to-white offset to visual axis (y-coordinate) [mm]	ALWAYS	AUTO
>>(771B,xx50)	3	FD	pup	Pupil diameter [mm]	ALWAYS	AUTO
>>(771B,xx51)	3	FD	pup_fpx	Horizontal pupil offset to visual axis (x-coordinate) [mm]	ALWAYS	AUTO
>>(771B,xx52)	3	FD	pup_fpy	Vertical pupil offset to visual axis (y-coordinate) [mm]	ALWAYS	AUTO

Table 8-10 Encapsulated PDF IOD - Module "IOL Formula"

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx36)	3	SQ	module_formula_sequence	Sequence of standard formula IOL calculations for 4 different IOL types with a sequence of 7 calculations each, may contain up to 6 items	ALWAYS	AUTO
>(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
>(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
>(771B,xx01)	3	SQ	formula_sequence	Sequence of standard formula IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>>(771B,xx02)	3	SQ	formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO
>>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>>(771B,xx25)	3	IS	status	Numerical value of eye status. Defined values: 0 = phakic eye, 1 = aphakic eye, 2 = silicone filled eye, 3 = pseudophakic silicone, 6 = pseudophakic memory, 7 = pseudophakic PMMA, 8 = pseudophakic acryl, 9 = silicone filled eye (aphakic), 10 = silicone filled eye (pseudophakic), 11 = phakic IOL PMMA (0,2mm), 12 = primary piggy-back silicone (SLM 2), 13 = primary piggy-back hydrophobic acrylate	ALWAYS	AUTO
>>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO
>>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO

>>>(771B,xx5A)	3	FD	wtw	White-to-white measurement [mm]	ALWAYS	AUTO
>>>(771B,xx5B)	3	CS	wtw_modified	White-to-white measurement [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx5C)	3	FD	lt	Lens thickness [mm]	ALWAYS	AUTO
>>>(771B,xx5D)	3	CS	lt_modified	Lens thickness [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>>>(771B,xx5F)	3	FD	age	Age of patient at the date of acquisition	ALWAYS	AUTO
>>(771B,xx03)	3	SQ	common_formula_lenses_sequence	Sequence of standard formula calculation results for 4 different IOL types with a sequence of 7 calculations each, may contain up to 4 items	ALWAYS	AUTO
>>>(771B,xx04)	3	CS	common_formula_lenses_sequence_type	Type of IOL	ALWAYS	AUTO
>>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>>(771B,xx05)	3	SQ	pair_sequence	Sequence of IOL calculation results for IOL as pair of lens power and residual refraction, may contain up to 9 items	ALWAYS	AUTO
>>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO
>>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO

Table 8-11 Encapsulated PDF IOD - Module “IOL Multi Formula”

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
(771B,xx0A)	3	LO	lens	Name of lens	ALWAYS	AUTO
(771B,xx01)	3	SQ	formula_sequence	Sequence of multi formula IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx02)	3	SQ	formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO

>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>(771B,xx25)	3	IS	status	Numerical value of eye status (see table)	ALWAYS	AUTO
>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO
>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO
>>(771B,xx5A)	3	FD	wtw	White-to-white measurement [mm]	ALWAYS	AUTO
>>(771B,xx5B)	3	CS	wtw_modified	White-to-white measurement [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx5C)	3	FD	lt	Lens thickness [mm]	ALWAYS	AUTO
>>(771B,xx5D)	3	CS	lt_modified	Lens thickness [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>>(771B,xx5F)	3	FD	age	Age of patient at the date of acquisition	ALWAYS	AUTO
>(771B,xx03)	3	SQ	common_formula_lenses_sequence	Sequence of multi formula calculation results (up to 4 formulas) for one IOL type with a sequence of 7 calculations each, may contain up to 4 items	ALWAYS	AUTO
>>(771B,xx04)	3	CS	common_formula_lenses_sequence_type	Type of IOL	ALWAYS	AUTO
>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>(771B,xx05)	3	SQ	pair_sequence	Sequence IOL calculation results for IOL as pair of lens power and residual refraction, may contain up to 9 items	ALWAYS	AUTO
>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO
>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO
(771B,xx07)	3	FD	constant	IOL-Konstanten	ALWAYS	AUTO

Table 8-12 Encapsulated PDF IOD - Module “IOL Haigis-L”

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx37)	3	SQ	module_haigis-l_sequence	Sequence of Haigis-L formula IOL calculations for 4 different IOL types with a sequence of 7 calculations each, may contain only one item	ALWAYS	AUTO
>(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
>(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
>(771B,xx01)	3	SQ	formula_sequence	Sequence of Haigis-L formula IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO

>>(771B,xx02)	3	SQ	formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO
>>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>>(771B,xx25)	3	IS	status	Numerical value of eye status (see table)	ALWAYS	AUTO
>>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO
>>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO
>>>(771B,xx5A)	3	FD	wtw	White-to-white measurement [mm]	ALWAYS	AUTO
>>>(771B,xx5B)	3	CS	wtw_modified	White-to-white measurement [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx5C)	3	FD	lt	Lens thickness [mm]	ALWAYS	AUTO
>>>(771B,xx5D)	3	CS	lt_modified	Lens thickness [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>>>(771B,xx5F)	3	FD	age	Age of patient at the date of acquisition	ALWAYS	AUTO
>>(771B,xx03)	3	SQ	common_formula_lenses_sequence	Sequence of Haigis-L formula calculation results for 4 different IOL types with a sequence of 7 calculations each	ALWAYS	AUTO
>>>(771B,xx04)	3	CS	common_formula_lenses_sequence_type	Type of IOL	ALWAYS	AUTO
>>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>>(771B,xx05)	3	SQ	pair_sequence	Sequence IOL calculation results for IOL as pair of lens power and residual refraction, may contain up to 9 items	ALWAYS	AUTO
>>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO

>>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO
>(771B,xx2D)	3	LO	warning_notice	Warning notice	ALWAYS	AUTO

Table 8-13 Encapsulated PDF IOD - Module "IOL phake IOL"

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
(771B,xx38)	3	SQ	phake_iol_formula_sequence	Sequence of phakic IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx3A)	3	SQ	phake_iol_formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO
>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>(771B,xx25)	3	IS	status	Numerical value of eye status (see table)	ALWAYS	AUTO
>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO
>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>(771B,xx2E)	3	IS	surgical_eye	Marker for eye undergoing surgery	ALWAYS	AUTO
>(771B,xx39)	3	SQ	phake_iol_lenses_sequence	Sequence of Phakic IOL formula calculation results for 4 different IOL types with a sequence of 7 calculations each	ALWAYS	AUTO
>>(771B,xx04)	3	CS	common_formula_lenses_sequence_type	Type of IOL	ALWAYS	AUTO
>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>(771B,xx05)	3	SQ	pair_sequence	Sequence IOL calculation results for IOL as pair of lens power and	ALWAYS	AUTO

				residual refraction, may contain up to 9 items		
>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO
>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO

Table 8-14 Encapsulated PDF IOD - Module "IOL Lens Database"

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx53)	3	SQ	lens_database_sequence	Sequence of lens constant definitions, may contain 1 or more items	ALWAYS	AUTO
>(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
>(771B,xx54)	3	SQ	lens_sequence	Sequence of surgeon specific lens constant definitions, may contain 1 or more items	ALWAYS	AUTO
>>(771B,xx06)	3	LO	name	Name of lens	ALWAYS	AUTO
>>(771B,xx59)	3	FD	lens_steps	Lens steps	ALWAYS	AUTO
>>(771B,xx55)	3	SQ	lens_constant_formula_sequence	Sequence of lens specific constants, may contain 1 or more items	ALWAYS	AUTO
>>>(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
>>>(771B,xx56)	3	SQ	lens_constant_sequence	Sequence of formula specific constants, may contain 1 or more items	ALWAYS	AUTO
>>>>(771B,xx57)	3	LO	lens_constant_name	Lens constant name	ALWAYS	AUTO
>>>>(771B,xx58)	3	FD	lens_constant_value	Lens constant value	ALWAYS	AUTO

8.1.1.2 Multi-frame True Color SC Image Information Object Definition

IE	Module	Usage
Patient		
	Patient	MANDATORY
Study		
	GeneralStudy	MANDATORY
Series		
	GeneralSeries	MANDATORY
FrameOfReference		
Equipment		
	GeneralEquipment	OPTIONAL
	ScEquipment	MANDATORY
Image		
	GeneralImage	MANDATORY
	ImagePixel	MANDATORY
	MultiFrame	MANDATORY
	ScImage	OPTIONAL
	ScMultiFrameImage	MANDATORY
	ScMultiFrameVector	CONDITIONAL
	SopCommon	MANDATORY
	IOL_Measured_Values	CONDITIONAL
	IOL_Formula	CONDITIONAL
	IOL_Multi_Formula	CONDITIONAL
	IOL_Haigis-L	CONDITIONAL
	IOL_phake IOL	CONDITIONAL
	IOL_Lens_Database	CONDITIONAL

Table 8-15 Multi-frame True Color SC Image – Module "Patient"

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

Table 8-16 Multi-frame True Color SC Image – Module "General Study"

GeneralStudy						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. In the unscheduled case IOLMaster 500 uses a constant prefix of "1.2.276.0.75.2.1.10.0.1."	ALWAYS	MWL, AUTO

				followed by a date/time stamp and a machine specific identifier. In the scheduled case the value is copied from the Modality Worklist.		
(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
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study. Value does not exist in the unscheduled case.	VNAP	MWL

Table 8-17 Multi-frame True Color SC Image – Module "General Series"

GeneralSeries						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series. IOLMaster 500 uses a constant prefix of "1.2.276.0.75.2.1.10.0.2." followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO
(0020,0011)	2	IS	Series Number	A number that identifies this Series. Series Number is always "0".	ALWAYS	AUTO
(0020,0060)	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, which can provide a more comprehensive mechanism for specifying the laterality of the body part(s) being examined.	EMPTY	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. 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). Attribute is always empty.	EMPTY	AUTO
(0018,0015)	3	CS	Body Part Examined	Text description of the part of the body examined. See PS 3.16 Annexes on Correspondence of Anatomic Region Codes and Body Part Examined for Humans and for Animals for Defined Terms Note: Some IODs support the Anatomic Region Sequence (0008,2218), which can provide a more comprehensive mechanism for specifying the body part being examined. Always "HEAD".	ALWAYS	AUTO
(0018,5100)	2C	CS	Patient Position	Always empty.	EMPTY	AUTO
(0040,0275)	3	SQ	Request Attributes Sequence	Sequence that contains attributes from the Imaging Service Request. IOLMaster 500 supports only one item.	VNAP	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. The value is copied from the Modality Worklist in the scheduled case.	VNAP	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. The value is copied from the Modality Worklist in the scheduled case.	VNAP	MWL
>(0040,0007)	3	LO	Scheduled Procedure Step Description	Institution-generated description or classification of the Scheduled Procedure Step to be performed. The value is copied from the Modality Worklist in the scheduled case.	VNAP	MWL

Table 8-18 Multi-frame True Color SC Image – Module "General Equipment"

GeneralEquipment						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0070)	2	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances. Always "Carl Zeiss Meditec".	ALWAYS	AUTO
(0008,1010)	3	SH	Station Name	User defined name identifying the machine that produced the composite instances. Always the hostname configured via IOLMaster500 settings dialog.	ALWAYS	CONFIG
(0008,1090)	3	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances. Always "IOLMaster 500".	ALWAYS	AUTO
(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	AUTO
(0018,1020)	3	LO	Software Version(s)	Manufacturer's designation of software version of the equipment that produced the composite instances. Always "7.5.2.0076".	ALWAYS	AUTO

Table 8-19 Multi-frame True Color SC Image – Module "SC Equipment"

ScEquipment						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**

(0008,0064)	1	CS	Conversion Type	Describes the kind of image conversion. Defined Terms : DV = Digitized Video DI = Digital Interface DF = Digitized Film WSD = Workstation SD = Scanned Document SI = Scanned Image DRW = Drawing SYN = Synthetic Image. Always “SYN”.	ALWAYS	AUTO
(0008,0060)	3	CS	Modality	“OT”	ALWAYS	AUTO

Table 8-20 Multi-frame True Color SC Image – Module “General Image”

GeneralImage						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,0013)	2	IS	Instance Number	A number that identifies this image. Note: This Attribute was named Image Number in earlier versions of this Standard. Always “1”.	ALWAYS	AUTO
(0020,0020)	2C	CS	Patient Orientation	Patient direction of the rows and columns of the image. Required if image does not require Image Orientation (Patient) (0020,0037) and Image Position (Patient) (0020,0032). May be present otherwise. See C.7.6.1.1.1 for further explanation. Always empty.	EMPTY	AUTO
(0008,0023)	2C	DA	Content Date	The date the image pixel data creation started. Required if image is part of a series in which the images are temporally related. Note: This Attribute was formerly known as Image Date.	ALWAYS	AUTO
(0008,0033)	2C	TM	Content Time	The time the image pixel data creation started. Required if image is part of a series in which the images are temporally related.	ALWAYS	AUTO
(0020,0012)	3	IS	Acquisition Number	A number identifying the single continuous gathering of data over a period of time that resulted in this image. Always “0”.	AUTO	ALWAYS
(0008,0022)	3	DA	Acquisition Date	The date the acquisition of data that resulted in this image started.	ALWAYS	AUTO
(0008,0032)	3	TM	Acquisition Time	The time the acquisition of data that resulted in this image started.	ALWAYS	AUTO
(0008,002A)	3	DT	Acquisition Datetime	The date and time that the acquisition of data that resulted in this image started. Note: The synchronization of this time with an external clock is specified in the Synchronization Module in Acquisition Time Synchronized (0018,1800).	ALWAYS	AUTO
(0008,1140)	3	SQ	Referenced Image Sequence	Other images significantly related to this image (e.g. post-localizer CT image or Mammographic biopsy or partial view images). Only present if reference sclera image acquisition has been performed. References OP dataset containing scleral images. If present the sequence contains one or two items.	ANAP	AUTO
>(0008,1150)	1	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class. Always “1.2.840.10008.5.1.4.1.1.77.1.5.1”.	ANAP	AUTO
>(0008,1155)	1	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance. SOP Instance UID of the referenced OP dataset.	ANAP	AUTO
>(0040,A170)	3	SQ	Purpose of Reference Code Sequence	CZM specified items are (99CZM, SCLERAL_IMG_L, "Image of patient’s left eye's scleral vessels."), (99CZM, SCLERAL_IMG_R, "Image of patient’s right eye's scleral vessels.")	ANAP	AUTO

>>(0008,0100)	1	SH	Code Value	SCLERAL_IMG_L or SCLERAL_IMG_R depending on the eye examined.	ANAP	AUTO
>>(0008,0102)	1	SH	Coding Scheme Designator	99CZM	ANAP	AUTO
>>(0008,0104)	1	LO	Code Meaning	"Image of patient's left eye's scleral vessels." or "Image of patient's right eye's scleral vessels." depending on the eye examined.	ANAP	AUTO
(0008,2111)	3	ST	Derivation Description	A text description of how this image was derived. See C.7.6.1.1.3 for further explanation. Always "IOLMaster Report".	ALWAYS	AUTO
(0028,2110)	3	CS	Lossy Image Compression	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression. 01 = Image has been subjected to lossy compression. Always "00".	ALWAYS	AUTO

Table 8-21 Multi-frame True Color SC Image – Module "Image Pixel"

ImagePixel						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0028,0002)	1	US	Samples per Pixel	Number of samples (planes) in this image. Always "3".	ALWAYS	AUTO
(0028,0004)	1	CS	Photometric Interpretation	Specifies the intended interpretation of the pixel data. Always "RGB".	ALWAYS	AUTO
(0028,0010)	1	US	Rows	Number of rows in the image.	ALWAYS	AUTO
(0028,0011)	1	US	Columns	Number of columns in the image	ALWAYS	AUTO
(0028,0100)	1	US	Bits Allocated	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated. See PS 3.5 for further explanation. Always „8".	ALWAYS	AUTO
(0028,0101)	1	US	Bits Stored	Number of bits stored for each pixel sample. Each sample shall have the same number of bits stored. See PS 3.5 for further explanation. Always „8".	ALWAYS	AUTO
(0028,0102)	1	US	High Bit	Most significant bit for pixel sample data. Each sample shall have the same high bit. See PS 3.5 for further explanation. Always „7".	ALWAYS	AUTO
(0028,0103)	1	US	Pixel Representation	Data representation of the pixel samples. Each sample shall have the same pixel representation. Enumerated Values: 0000 = unsigned integer. 0001 = 2's complement. Always „0".	ALWAYS	AUTO
(7FE0,0010)	1C	OB|OW	Pixel Data	A data stream of the pixel samples that comprise the Image. See C.7.6.3.1.4 for further explanation. Required if Pixel Data Provider URL (0028,7FE0) is not present.	ALWAYS	AUTO
(0028,0006)	1C	US	Planar Configuration	Indicates whether the pixel data are sent color-by-plane or color-by-pixel. Required if Samples per Pixel (0028,0002) has a value greater than 1. See C.7.6.3.1.3 for further	ALWAYS	AUTO

				explanation. Always „1“.		

Table 8-22 Multi-frame True Color SC Image – Module “Multi Frame”

MultiFrame						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0028,0008)	1	IS	Number of Frames	Number of frames in a Multi-frame Image.	ALWAYS	AUTO

Table 8-23 Multi-frame True Color SC Image – Module “SC Multi Frame Image”

ScMultiFrameImage						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0028,0301)	1	CS	Burned In Annotation	Indicates whether or not image contains sufficient burned in annotation to identify the patient and date the image was acquired. Enumerated Values: YES NO. Always „YES“.	ALWAYS	AUTO
(0028,0009)	1C	AT	Frame Increment Pointer	Contains the Data Element Tag of the attribute which is used as the frame increment in Multi-frame pixel data. Shall be present if Number of Frames is greater than 1, overriding (specializing) the Type 1 requirement on this attribute in the Multi-frame Module. Always “(0018,2001)”.	ALWAYS	AUTO

Table 8-24 Multi-frame True Color SC Image – Module “SC Multi Frame Vector”

ScMultiFrameVector						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0018,2001)	1C	IS	Page Number Vector	An array which contains, for each of the image frames, the corresponding page numbers of the original document. Required if Frame Increment Pointer (0028,0009) points to Page Number Vector (0018,2001).	ALWAYS	AUTO

Table 8-25 Multi-frame True Color SC Image – Module “Sop Common”

SopCommon						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0016)	1	UI	SOP Class UID	Uniquely identifies the SOP Class. Always „1.2.840.10008.5.1.4.1.1.7.4“.	ALWAYS	AUTO
(0008,0018)	1	UI	SOP Instance UID	Uniquely identifies the SOP Instance IOLMaster 500 uses a constant prefix of „1.2.276.0.75.2.1.10.0.3.“ followed by a date/time stamp and a machine specific identifier.	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. Always „ISO_IR 100“.	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

Table 8-26 Multi-frame True Color SC Image - Module "IOL_Measured_Values"

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx30)	3	SQ	axial_length_values_sequence	Sequence of axial length values measured for one eye, may contain one ore two items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx31)	3	SQ	axial_length_values_triple_sequence	Sequence of single axial length measurements, may contain up to 20 items	ALWAYS	AUTO
>>(771B,xx0B)	3	FD	al	Axial length optical (single measurement) [mm]	ALWAYS	AUTO
>>(771B,xx0C)	3	FD	snr	Signal to noise ratio (single measurement)	ALWAYS	AUTO
>>(771B,xx0D)	3	FD	index_tag	Index of single measurement	ALWAYS	AUTO
>(771B,xx43)	3	FD	mean_value_al	Axial length optical (composite value) [mm]	ALWAYS	AUTO
>(771B,xx44)	3	FD	mean_value_snr	Signal to noise ratio (composite value)	ALWAYS	AUTO
(771B,xx32)	3	SQ	keratometer_values_sequence	Sequence of keratometry values measured for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx33)	3	SQ	keratometer_values_ntupel_sequence	Sequence of single keratometry measurements, may contain up to 3 items	ALWAYS	AUTO
>>(771B,xx0F)	3	FD	r1	Corneal radius of curvature of flat meridian [mm]	ALWAYS	AUTO
>>(771B,xx11)	3	FD	d1	Corneal refractive power of flat meridian [dpt]	ALWAYS	AUTO
>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>(771B,xx10)	3	FD	r2	Corneal radius of curvature of steep meridian [mm]	ALWAYS	AUTO
>>(771B,xx12)	3	FD	d2	Corneal refractive power of steep meridian [dpt]	ALWAYS	AUTO
>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO
>>(771B,xx15)	3	FD	zyl	Difference between steep and flat keratometric power [dpt]	ALWAYS	AUTO
>(771B,xx16)	3	FD	refractive_index	Refractive index corneal power is based on	ALWAYS	AUTO
>(771B,xx17)	3	FD	quali_tag	Standard deviation in series of measurements	ALWAYS	AUTO
>(771B,xx49)	3	FD	mean_value_r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>(771B,xx4A)	3	FD	mean_value_d1	Mean value of power in flat meridian [dpt]	ALWAYS	AUTO
>(771B,xx4B)	3	FD	mean_value_a1	Mean value of axis of flat meridian [°]	ALWAYS	AUTO
>(771B,xx4C)	3	FD	mean_value_r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>(771B,xx4D)	3	FD	mean_value_d2	Mean value of power in steep meridian [dpt]	ALWAYS	AUTO
>(771B,xx4E)	3	FD	mean_value_a2	Mean value of axis of steep meridian [°]	ALWAYS	AUTO
>(771B,xx4F)	3	FD	mean_value_zyl	Mean value of difference between steep and flat keratometric power [dpt]	ALWAYS	AUTO
(771B,xx34)	3	SQ	chamber_depth_values_sequence	Sequence of anterior chamber depth values measured for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx18)	3	FD	num1	Measurement 1 of anterior chamber depth [mm]	ALWAYS	AUTO

>(771B,xx19)	3	FD	num2	Measurement 2 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx1A)	3	FD	num3	Measurement 3 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx1B)	3	FD	num4	Measurement 4 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx1C)	3	FD	num5	Measurement 5 of anterior chamber depth [mm]	ALWAYS	AUTO
>(771B,xx0E)	3	FD	mean_value	Mean value of anterior chamber depth [mm]	ALWAYS	AUTO
(771B,xx35)	3	SQ	white_to_white_sequence	Sequence of white-to-white values measured for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx3B)	3	SQ	white_to_white_values_sequence	Sequence of single white-to-white measurements, may contain up to 3 items	ALWAYS	AUTO
>>(771B,xx1D)	3	FD	wzw	White-to-white diameter [mm]	ALWAYS	AUTO
>>(771B,xx1E)	3	FD	fpx	Horizontal white-to-white offset to visual axis (x-coordinate) [mm]	ALWAYS	AUTO
>>(771B,xx1F)	3	FD	fpy	Vertical white-to-white offset to visual axis (y-coordinate) [mm]	ALWAYS	AUTO
>>(771B,xx50)	3	FD	pup	Pupil diameter [mm]	ALWAYS	AUTO
>>(771B,xx51)	3	FD	pup_fpx	Horizontal pupil offset to visual axis (x-coordinate) [mm]	ALWAYS	AUTO
>>(771B,xx52)	3	FD	pup_fpy	Vertical pupil offset to visual axis (y-coordinate) [mm]	ALWAYS	AUTO

Table 8-27 Multi-frame True Color SC Image - Module "IOL Formula"

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx36)	3	SQ	module_formula_sequence	Sequence of standard formula IOL calculations for 4 different IOL types with a sequence of 7 calculations each, may contain up to 6 items	ALWAYS	AUTO
>(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
>(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
>(771B,xx01)	3	SQ	formula_sequence	Sequence of standard formula IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>>(771B,xx02)	3	SQ	formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated	ALWAYS	AUTO

				values: YES, NO		
>>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO
>>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>>(771B,xx25)	3	IS	status	Numerical value of eye status. Defined values: 0 = phakic eye, 1 = aphakic eye, 2 = silicone filled eye, 3 = pseudophakic silicone, 6 = pseudophakic memory, 7 = pseudophakic PMMA, 8 = pseudophakic acryl, 9 = silicone filled eye (aphakic), 10 = silicone filled eye (pseudophakic), 11 = phakic IOL PMMA (0,2mm), 12 = primary piggy-back silicone (SLM 2), 13 = primary piggy-back hydrophobic acrylate	ALWAYS	AUTO
>>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO
>>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO
>>>(771B,xx5A)	3	FD	wtw	White-to-white measurement [mm]	ALWAYS	AUTO
>>>(771B,xx5B)	3	CS	wtw_modified	White-to-white measurement [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx5C)	3	FD	lt	Lens thickness [mm]	ALWAYS	AUTO
>>>(771B,xx5D)	3	CS	lt_modified	Lens thickness [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>>>(771B,xx5F)	3	FD	age	Age of patient at the date of acquisition	ALWAYS	AUTO
>>(771B,xx03)	3	SQ	common_formula_lenses_sequence	Sequence of standard formula calculation results for 4 different IOL types with a sequence of 7 calculations each, may contain up to 4 items	ALWAYS	AUTO
>>>(771B,xx04)	3	CS	common_formula_lenses_sequence_type	Type of IOL	ALWAYS	AUTO
>>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>>(771B,xx05)	3	SQ	pair_sequence	Sequence of IOL calculation results for IOL as pair of lens power and residual refraction, may contain up to 9 items	ALWAYS	AUTO
>>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO
>>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO

Table 8-28 Multi-frame True Color SC Image - Module "IOL Multi Formula"

Tag	Type	VR	Name	Description	PoV	Source

(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
(771B,xx0A)	3	LO	lens	Name of lens	ALWAYS	AUTO
(771B,xx01)	3	SQ	formula_sequence	Sequence of multi formula IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx02)	3	SQ	formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO
>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>(771B,xx25)	3	IS	status	Numerical value of eye status (see table)	ALWAYS	AUTO
>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO
>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO
>>(771B,xx5A)	3	FD	wtw	White-to-white measurement [mm]	ALWAYS	AUTO
>>(771B,xx5B)	3	CS	wtw_modified	White-to-white measurement [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx5C)	3	FD	lt	Lens thickness [mm]	ALWAYS	AUTO
>>(771B,xx5D)	3	CS	lt_modified	Lens thickness [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>>(771B,xx5F)	3	FD	age	Age of patient at the date of acquisition	ALWAYS	AUTO
>(771B,xx03)	3	SQ	common_formula_lenses_sequence	Sequence of multi formula calculation results (up to 4 formulas) for one IOL type with a sequence of 7 calculations each, may contain up to 4 items	ALWAYS	AUTO
>>(771B,xx04)	3	CS	common_formula_lenses	Type of IOL	ALWAYS	AUTO

			_sequence_type			
>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>(771B,xx05)	3	SQ	pair_sequence	Sequence IOL calculation results for IOL as pair of lens power and residual refraction, may contain up to 9 items	ALWAYS	AUTO
>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO
>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO
(771B,xx07)	3	FD	constant	IOL-Konstanten	ALWAYS	AUTO

Table 8-29 Multi-frame True Color SC Image - Module "IOL Haigis-L"

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx37)	3	SQ	module_haigis-l_sequence	Sequence of Haigis-L formula IOL calculations for 4 different IOL types with a sequence of 7 calculations each, may contain only one item	ALWAYS	AUTO
>(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
>(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
>(771B,xx01)	3	SQ	formula_sequence	Sequence of Haigis-L formula IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>>(771B,xx02)	3	SQ	formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO
>>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>>(771B,xx25)	3	IS	status	Numerical value of eye status (see table)	ALWAYS	AUTO
>>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO

>>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx13)	3	FD	a1	Axis of flat meridian [°]	ALWAYS	AUTO
>>>(771B,xx14)	3	FD	a2	Axis of steep meridian [°]	ALWAYS	AUTO
>>>(771B,xx5A)	3	FD	wtw	White-to-white measurement [mm]	ALWAYS	AUTO
>>>(771B,xx5B)	3	CS	wtw_modified	White-to-white measurement [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx5C)	3	FD	lt	Lens thickness [mm]	ALWAYS	AUTO
>>>(771B,xx5D)	3	CS	lt_modified	Lens thickness [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>>>(771B,xx5F)	3	FD	age	Age of patient at the date of acquisition	ALWAYS	AUTO
>>(771B,xx03)	3	SQ	common_formula_lenses_sequence	Sequence of Haigis-L formula calculation results for 4 different IOL types with a sequence of 7 calculations each	ALWAYS	AUTO
>>>(771B,xx04)	3	CS	common_formula_lenses_sequence_type	Type of IOL	ALWAYS	AUTO
>>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>>(771B,xx05)	3	SQ	pair_sequence	Sequence IOL calculation results for IOL as pair of lens power and residual refraction, may contain up to 9 items	ALWAYS	AUTO
>>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO
>>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO
>(771B,xx2D)	3	LO	warning_notice	Warning notice	ALWAYS	AUTO

Table 8-30 Multi-frame True Color SC Image - Module “IOL phake IOL”

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
(771B,xx38)	3	SQ	phake_iol_formula_sequence	Sequence of phakic IOL calculations for one eye, may contain 1 or 2 items	ALWAYS	AUTO
>(771B,xx08)	3	CS	iol_laterality	Laterality (OD, OS)	ALWAYS	AUTO
>(771B,xx3A)	3	SQ	phake_iol_formula_ntupel_sequence	Container of measurement values used for calculation	ALWAYS	AUTO
>>(771B,xx0B)	3	FD	al	Axial length [mm]	ALWAYS	AUTO
>>(771B,xx45)	3	CS	al_modified	Axial length [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx20)	3	FD	k1	Mean value of power in flat meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx21)	3	FD	k2	Mean value of power in steep meridian [dpt] US nomenclature	ALWAYS	AUTO
>>(771B,xx0F)	3	FD	r1	Mean value of radius in flat meridian [mm]	ALWAYS	AUTO
>>(771B,xx10)	3	FD	r2	Mean value of radius in steep meridian [mm]	ALWAYS	AUTO
>>(771B,xx11)	3	FD	d1	Mean value of power in flat meridian [dpt] EU nomenclature	ALWAYS	AUTO
>>(771B,xx12)	3	FD	d2	Mean value of power in steep meridian [dpt] EU nomenclature	ALWAYS	AUTO

>>(771B,xx46)	3	CS	k_modified	Mean value of power [dpt] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx26)	3	FD	acd	Anterior Chamber Depth [mm]	ALWAYS	AUTO
>>(771B,xx48)	3	CS	acd_modified	Anterior Chamber Depth [mm] value changed manually. Enumerated values: YES, NO	ALWAYS	AUTO
>>(771B,xx22)	3	FD	se	Spherical Equivalent [dpt]	ALWAYS	AUTO
>>(771B,xx24)	3	FD	n	Refractive index corneal power is based on	ALWAYS	AUTO
>>(771B,xx25)	3	IS	status	Numerical value of eye status (see table)	ALWAYS	AUTO
>>(771B,xx27)	3	FD	va	Visual Acuity	ALWAYS	AUTO
>>(771B,xx40)	3	FD	sphere	RX sphere [dpt]	ALWAYS	AUTO
>>(771B,xx41)	3	FD	cylinder	RX cylinder [dpt]	ALWAYS	AUTO
>>(771B,xx42)	3	FD	axis	RX axis [°]	ALWAYS	AUTO
>>(771B,xx29)	3	FD	target_ref	Target refraction [dpt]	ALWAYS	AUTO
>>(771B,xx2F)	3	FD	vertex	Vertex distance [mm]	ALWAYS	AUTO
>(771B,xx2E)	3	IS	surgical_eye	Marker for eye undergoing surgery	ALWAYS	AUTO
>(771B,xx39)	3	SQ	phake_iol_lenses_sequence	Sequence of Phakic IOL formula calculation results for 4 different IOL types with a sequence of 7 calculations each	ALWAYS	AUTO
>>(771B,xx04)	3	CS	common_formula_lenses_sequence_type	Type of IOL	ALWAYS	AUTO
>>(771B,xx06)	3	LO	name	Name of IOL	ALWAYS	AUTO
>>(771B,xx05)	3	SQ	pair_sequence	Sequence IOL calculation results for IOL as pair of lens power and residual refraction, may contain up to 9 items	ALWAYS	AUTO
>>>(771B,xx2A)	3	FD	iol	IOL power [dpt]	ALWAYS	AUTO
>>>(771B,xx28)	3	FD	ref	Residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx2B)	3	FD	emmetropia	Ideal IOL power for zero residual refraction [dpt]	ALWAYS	AUTO
>>(771B,xx07)	3	FD	constant	IOL constants, up to 4 constant values available	ALWAYS	AUTO

Table 8-31 Multi-frame True Color SC Image - Module “IOL Lens Database”

Tag	Type	VR	Name	Description	PoV	Source
(771B,xx53)	3	SQ	lens_database_sequence	Sequence of lens constant definitions, may contain 1 or more items	ALWAYS	AUTO
>(771B,xx2C)	3	LO	surgeon	Name of surgeon	ALWAYS	AUTO
>(771B,xx54)	3	SQ	lens_sequence	Sequence of surgeon specific lens constant definitions, may contain 1 or more items	ALWAYS	AUTO
>>(771B,xx06)	3	LO	name	Name of lens	ALWAYS	AUTO
>>(771B,xx59)	3	FD	lens_steps	Lens steps	ALWAYS	AUTO
>>(771B,xx55)	3	SQ	lens_constant_formula_sequence	Sequence of lens specific constants, may contain 1 or more items	ALWAYS	AUTO
>>>(771B,xx09)	3	LO	formula_denominator	Name of formula	ALWAYS	AUTO
>>>(771B,xx56)	3	SQ	lens_constant_sequence	Sequence of formula specific constants, may contain 1 or more items	ALWAYS	AUTO
>>>>(771B,xx57)	3	LO	lens_constant_name	Lens constant name	ALWAYS	AUTO
>>>>(771B,xx58)	3	FD	lens_constant_value	Lens constant value	ALWAYS	AUTO

8.1.1.3 Ophthalmic Photography 8 Bit Image Information Object Definition

IE	Module	Usage
Patient		
	Patient	MANDATORY
Study		
	GeneralStudy	MANDATORY
Series		
	GeneralSeries	MANDATORY
	OphthalmicPhotographySeries	MANDATORY
FrameOfReference		
Equipment		
	GeneralEquipment	MANDATORY
Image		
	GeneralImage	MANDATORY
	ImagePixel	MANDATORY
	EnhancedContrastBolus	CONDITIONAL
	Cine	CONDITIONAL
	MultiFrame	MANDATORY
	AcquisitionContext	OPTIONAL
	OphthalmicPhotographyImage	MANDATORY
	OcularRegionImaged	MANDATORY
	OphthalmicPhotographyAcquisitionParameters	MANDATORY
	OphthalmicPhotographicParameters	MANDATORY
	SopCommon	MANDATORY

Table 8-32 Ophthalmic Photography 8 Bit Image – Module "Patient"

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

Table 8-33 Ophthalmic Photography 8 Bit Image – Module "General Study"

GeneralStudy						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,000D)	1	UI	Study Instance UID	Unique identifier for the Study. In the unscheduled case IOLMaster 500 uses a constant prefix of "1.2.276.0.75.2.1.10.0.1." followed by a date/time stamp and a machine	ALWAYS	MWL, AUTO

				specific identifier. In the scheduled case the value is copied from the Modality Worklist.		
(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
(0008,0050)	2	SH	Accession Number	A RIS generated number that identifies the order for the Study.	VNAP	MWL

Table 8-34 Ophthalmic Photography 8 Bit Image – Module "General Series"

GeneralSeries						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,000E)	1	UI	Series Instance UID	Unique identifier of the Series. IOLMaster 500 uses a constant prefix of "1.2.276.0.75.2.1.10.0.2." followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO
(0020,0011)	2	IS	Series Number	A number that identifies this Series. Series Number is always "2".	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. 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 empty.	EMPTY	ALWAYS
(0018,0015)	3	CS	Body Part Examined	Text description of the part of the body examined. See PS 3.16 Annexes on Correspondence of Anatomic Region Codes and Body Part Examined for Humans and for Animals for Defined Terms Note: Some IODs support the Anatomic Region Sequence (0008,2218), which can provide a more comprehensive mechanism for specifying the body part being examined. Always "HEAD".	ALWAYS	AUTO
(0018,5100)	2C	CS	Patient Position	Always empty.	EMPTY	AUTO
(0040,0275)	3	SQ	Request Attributes Sequence	Sequence that contains attributes from the Imaging Service Request. Attribute only present in the scheduled case. The sequence contains only one item.	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. Attribute only present in the scheduled case.	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. Attribute only present in the scheduled case.	ANAP	MWL
>(0040,0007)	3	LO	Scheduled Procedure Step Description	Institution-generated description or classification of the Scheduled Procedure Step to be performed. Attribute only present in the scheduled case.	ANAP	MWL

Table 8-35 Ophthalmic Photography 8 Bit Image – Module "Ophthalmic Photography Series"

OphthalmicPhotographySeries						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0060)	1	CS	Modality	Source equipment that produced the Ophthalmic Photography Series. Enumerated Value: „OP“	ALWAYS	AUTO

Table 8-36 Ophthalmic Photography 8 Bit Image – Module "Synchronization"

Synchronization						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,0200)	1	UI	Synchronization Frame of Reference UID	UID of common synchronization environment. IOLMaster 500 uses a constant prefix of "1.2.276.0.75.2.5.10.1.2".	ALWAYS	AUTO
(0018,106A)	1	CS	Synchronization Trigger	Data acquisition synchronization with external equipment Enumerated Values: SOURCE - this equipment provides synchronization channel or trigger to other equipment EXTERNAL - this equipment receives synchronization channel or trigger from other equipment PASSTHRU - this equipment receives synchronization channel or trigger and forwards it NO TRIGGER - data acquisition not synchronized by common channel or trigger. Always "NO TRIGGER".	ALWAYS	AUTO
(0018,1800)	1	CS	Acquisition Time Synchronized	Acquisition DateTime (0008,002A) synchronized with external time reference. Always „N“.	ALWAYS	AUTO

Table 8-37 Ophthalmic Photography 8 Bit Image – Module "General Equipment"

GeneralEquipment						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0070)	2	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances. Always "Carl Zeiss Meditec".	ALWAYS	AUTO
(0008,1010)	3	SH	Station Name	User defined name identifying the machine that produced the composite instances. Always the hostname configurable via IOLMaster 500 settings dialog.	ALWAYS	CONFIG
(0008,1090)	3	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances. Always "IOLMaster 500".	ALWAYS	AUTO

(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	AUTO
(0018,1020)	3	LO	Software Version(s)	Manufacturer's designation of software version of the equipment that produced the composite instances. Always „7.5.2.0076“.	ALWAYS	AUTO

Table 8-38 Ophthalmic Photography 8 Bit Image – Module "General Image"

GeneralImage						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,0020)	2C	CS	Patient Orientation	Patient direction of the rows and columns of the image. Required if image does not require Image Orientation (Patient) (0020,0037) and Image Position (Patient) (0020,0032). May be present otherwise. Always "L\F".	ALWAYS	AUTO
(0020,0012)	3	IS	Acquisition Number	A number identifying the single continuous gathering of data over a period of time that resulted in this image. Always "0".	ALWAYS	AUTO
(0008,0022)	3	DA	Acquisition Date	The date the acquisition of data that resulted in this image started	ALWAYS	AUTO
(0008,0032)	3	TM	Acquisition Time	The time the acquisition of data that resulted in this image started	ALWAYS	AUTO

Table 8-39 Ophthalmic Photography 8 Bit Image – Module "Image Pixel"

ImagePixel						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0028,0010)	1	US	Rows	Number of rows in the image.	ALWAYS	AUTO
(0028,0011)	1	US	Columns	Number of columns in the image	ALWAYS	AUTO
(0028,0100)	1	US	Bits Allocated	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated. See PS 3.5 for further explanation. Always „8“.	ALWAYS	AUTO
(0028,0101)	1	US	Bits Stored	Number of bits stored for each pixel sample. Each sample shall have the same number of bits stored. See PS 3.5 for further explanation. Always „8“.	ALWAYS	AUTO
(0028,0102)	1	US	High Bit	Most significant bit for pixel sample data. Each sample shall have the same high bit. See PS 3.5 for further explanation. Always „7“.	ALWAYS	AUTO
(7FE0,0010)	1C	OB|OW	Pixel Data	A data stream of the pixel samples that comprise the Image. See C.7.6.3.1.4 for further explanation. Required if Pixel Data Provider URL (0028,7FE0) is not present.	ALWAYS	AUTO

Table 8-40 Ophthalmic Photography 8 Bit Image – Module "Cine"

Cine						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0018,1063)	1C	DS	Frame Time	Nominal time (in msec) per individual frame. See C.7.6.5.1.1 for further explanation. Required if Frame Increment Pointer (0028,0009) points to Frame Time.	ALWAYS	AUTO

				Always „0“.		

Table 8-41 Ophthalmic Photography 8 Bit Image – Module “Multi Frame”

MultiFrame						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0028,0008)	1	IS	Number of Frames	Number of frames in a Multi-frame Image. Always “1”.	ALWAYS	AUTO
(0028,0009)	1	AT	Frame Increment Pointer	Contains the Data Element Tag of the attribute that is used as the frame increment in Multi-frame pixel data. Always “(0018,1063)”.	ALWAYS	AUTO

Table 8-42 Ophthalmic Photography 8 Bit Image – Module “Acquisition Context”

AcquisitionContext						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0040,0555)	2	SQ	Acquisition Context Sequence	A sequence of Items that describes the conditions present during the acquisition of the data of the SOP Instance. Zero or more items may be included in this sequence.	ALWAYS	AUTO
>(0040,A043)	1	SQ	Concept Name Code Sequence	A concept that constrains the meaning of (i.e. defines the role of) the Observation Value. The "Name" component of a Name/Value pair. This sequence shall contain exactly one item.	ALWAYS	AUTO
>>(0008,0100)	1	SH	Code Value	For possible values see section 8.3 Coded Terminology And Templates	ALWAYS	AUTO
>>(0008,0102)	1	SH	Coding Scheme Designator	For possible values see section 8.3 Coded Terminology And Templates	ALWAYS	AUTO
>>(0008,0104)	1	LO	Code Meaning	For possible values see section 8.3 Coded Terminology And Templates	ALWAYS	AUTO
>(0040,A30A)	1C	DS	Numeric Value	This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a set of one or more numeric values. Required if the value that Concept Name Code Sequence (0040,A043) requires (implies) is a set of one or more integers or real numbers. Shall not be present otherwise.	ALWAYS	AUTO
>(0040,08EA)	1C	SQ	Measurement Units Code Sequence	Units of measurement. Only a single Item shall be permitted in this Sequence. Required if Numeric Value (0040,A30A) is sent. Shall not be present otherwise.	ALWAYS	AUTO
>>(0008,0100)	1	SH	Code Value	For possible values see section 8.3 Coded Terminology And Templates	ALWAYS	AUTO
>>(0008,0102)	1	SH	Coding Scheme Designator	For possible values see section 8.3 Coded Terminology And Templates	ALWAYS	AUTO
>>(0008,0104)	1	LO	Code Meaning	See section 8.3 Coded Terminology And Templates Always „range: 0.0:1.0“.	ALWAYS	AUTO

Table 8-43 Ophthalmic Photography 8 Bit Image – Module “Ophthalmic Photography Image”

OphthalmicPhotographyImage						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0008)	1	CS	Image Type	Image identification characteristics. Always “ORIGINAL\PRIMARY\\SCLERA”.	ALWAYS	AUTO
(0020,0013)	1	IS	Instance Number	A number that identifies this image. Always “1”.	ALWAYS	AUTO
(0028,0002)	1	US	Samples per	Number of samples (planes) in this image.	ALWAYS	AUTO

			Pixel	Enumerated values: 1 or 3. Always “1”		
(0028,0004)	1	CS	Photometric Interpretation	Specifies the intended interpretation of the pixel data. Always „MONOCHROME2“.	ALWAYS	AUTO
(0028,0103)	1	US	Pixel Representation	Data representation of the pixel samples. Each sample shall have the same pixel representation. Always „0“.	ALWAYS	AUTO
(0028,0030)	1C	DS	Pixel Spacing	Nominal physical distance at the focal plane (in the retina) between the center of each pixel, specified by a numeric pair - adjacent row spacing (delimiter) adjacent column spacing in mm. See 10.7.1.3 for further explanation of the value order. Note: These values are specified as nominal because the physical distance may vary across the field of the images and the lens correction is likely to be imperfect. Always present.	ALWAYS	AUTO
(0008,0033)	1	TM	Content Time	The time the image pixel data creation started.	ALWAYS	AUTO
(0008,0023)	1	DA	Content Date	The date the image pixel data creation started.	ALWAYS	AUTO
(0008,002A)	1C	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). Required if Image Type (0008,0008) Value 1 is ORIGINAL. May be present otherwise. Always present.	ALWAYS	AUTO
(0028,2110)	1	CS	Lossy Image Compression	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression. 01 = Image has been subjected to lossy compression. Always „01“.	ALWAYS	AUTO
(0028,2112)	1C	DS	Lossy Image Compression Ratio	Describes the approximate lossy compression ratio(s) that have been applied to this image. See C.7.6.1.1.5 for further explanation. May be multivalued if successive lossy compression steps have been applied. Notes: 1. For example, a compression ratio of 30:1 would be described in this Attribute with a single value of 30. 2. For historical reasons, the lossy compression ratio should also be described in Derivation Description (0008,2111) Required if Lossy Image Compression (0028,2110) has a value of "01". Always “1”.	ALWAYS	AUTO
(0028,2114)	1C	CS	Lossy Image Compression Method	A label for the lossy compression method(s) that have been applied to this image. See C.7.6.1.1.5 for further explanation. May be multivalued if successive lossy compression steps have been applied; the value order shall correspond to the values of Lossy Image Compression Ratio (0028,2112). Required if Lossy Image Compression (0028,2110) has a value of "01". Note: For historical reasons, the lossy compression method should also be described in Derivation Description (0008,2111). Always “ISO_10918_1”.	ALWAYS	AUTO
(2050,0020)	1C	CS	Presentation LUT Shape	Specifies an identity transformation for the Presentation LUT, such that the output of all	ALWAYS	AUTO

				grayscale transformations defined in the IOD containing this Module are defined to be P-Values. Enumerated Values: IDENTITY - output is in P-Values. Required if Photometric Interpretation (0028,0004) is MONOCHROME2 Always "IDENTITY".		
(0028,0301)	1	CS	Burned In Annotation	Indicates whether or not image contains sufficient burned in annotation to identify the patient and date the image was acquired. Always „YES".	ALWAYS	AUTO

Table 8-44 Ophthalmic Photography 8 Bit Image – Module "Ocular Region Imaged"

OcularRegionImaged						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0020,0062)	1	CS	Image Laterality	Laterality of object imaged (as described in Anatomic Region Sequence (0008,2218)) examined. Enumerated Values: R = right eye L = left eye B = both left and right eye Shall be consistent with any laterality information contained in Primary Anatomic Structure Modifier Sequence (0008,2230), if present. Note: Laterality (0020,0060) is a Series level Attribute and must be the same for all Images in the Series. Since most Ophthalmic Photographic Image studies contain images of both eyes, the series level attribute will rarely be present. Values: "L" or "R" depending on the eye examined.	ALWAYS	AUTO
(0008,2218)	1	SQ	Anatomic Region Sequence	Sequence that identifies the anatomic region of interest in this Instance (i.e. external anatomy, surface anatomy, or general region of the body). Only a single Item shall be permitted in this sequence.	ALWAYS	AUTO
>(0008,0100)	1	SH	Code Value	Always „T-AA000".	ALWAYS	AUTO
>(0008,0102)	1	SH	Coding Scheme Designator	Always „SRT".	ALWAYS	AUTO
>(0008,0104)	1	LO	Code Meaning	Always „Eye".	ALWAYS	AUTO

Table 8-45 Ophthalmic Photography 8 Bit Image – Module "Ophthalmic Photography Acquisition Parameters"

OphthalmicPhotographyAcquisitionParameters						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0022,0005)	2	CS	Patient Eye Movement Commanded	Always empty.	EMPTY	AUTO
(0022,001B)	2	SQ	Refractive State Sequence	The refractive state of the imaged eye at the time of acquisition. Always empty.	EMPTY	AUTO
(0022,000A)	2	FL	Emmetropic Magnification	Emmetropic magnification value (dimensionless Always empty.	EMPTY	AUTO
(0022,000B)	2	FL	Intra Ocular Pressure	Value of intraocular pressure in mmHg. Always empty.	EMPTY	AUTO
(0022,000D)	2	CS	Pupil Dilated	Always empty.	EMPTY	AUTO

Table 8-46 Ophthalmic Photography 8 Bit Image – Module "Ophthalmic Photographic Parameters"

OphthalmicPhotographicParameters						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0022,0015)	1	SQ	Acquisition Device Type Code Sequence	Describes the type of acquisition device. A single item shall be present in the sequence.	ALWAYS	AUTO
>(0008,0100)	1	SH	Code Value	Always „R-1021B".	ALWAYS	AUTO
>(0008,0102)	1	SH	Coding Scheme Designator	Always „SRT".	ALWAYS	AUTO
>(0008,0104)	1	LO	Code Meaning	Always „External Camera".	ALWAYS	AUTO
(0022,0016)	2	SQ	Illumination Type Code Sequence	Coded value for illumination. Always empty.	EMPTY	AUTO
(0022,0017)	2	SQ	Light Path Filter Type Stack Code Sequence	Filters used in the light source path. Always empty.	EMPTY	AUTO
(0022,0018)	2	SQ	Image Path Filter Type Stack Code Sequence	Describes stack of filters used in image path Always empty.	EMPTY	AUTO
(0022,0019)	2	SQ	Lenses Code Sequence	Lenses that were used during the image acquisition. Always empty.	EMPTY	AUTO
(0018,7004)	2	CS	Detector Type	Type of detector used for creating this image. Always empty.	EMPTY	AUTO

Table 8-47 Ophthalmic Photography 8 Bit Image – Module "Sop Common"

SopCommon						
Tag	**Type**	**VR**	**Name**	**Description**	**PoV**	**Source**
(0008,0016)	1	UI	SOP Class UID	Uniquely identifies the SOP Class. Always „1.2.840.10008.5.1.4.1.1.77.1.5.1".	ALWAYS	AUTO
(0008,0018)	1	UI	SOP Instance UID	Uniquely identifies the SOP Instance. IOLMaster 500 uses a constant prefix of „1.2.276.0.75.2.1.10.0.3." followed by a date/time stamp and a machine specific identifier.	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. Always „ISO_IR 100".	ALWAYS	AUTO
(0008,0012)	3	DA	Instance Creation Date	Date the SOP Instance was created.	ALWAYS	AUTO
(0008,0013)	3	TM	Instance Creation Time	Time the SOP Instance was created.	ALWAYS	AUTO

8.1.2 Usage Of Attributes From Received IOD's

The usage of attributes of Modality Worklist IODs is described in chapter 4.2.1.3.1 Activity – Query Modality Worklist

8.1.3 Attribute Mapping

Modality Worklist	Instance IOD
Study Instance UID	Study Instance UID
Referenced Study Sequence	Referenced Study Sequence
Accession Number	Accession Number
Requested Procedure ID	Request Attributes Sequence > Requested Procedure ID
Scheduled Procedure Step Sequence > Scheduled Procedure Step ID	Request Attributes Sequence > Scheduled Procedure Step ID
Scheduled Procedure Step Sequence > Scheduled Procedure Step Description	Request Attributes Sequence > Scheduled Procedure Step Description
Referring Physicians Name	Referring Physicians Name
Patients Name	Patients Name
Patient ID	Patient ID
Issuer of Patient ID	Issuer of Patient ID
Patients Birth Date	Patients Birth Date
Patients Sex	Patients Sex
Other Patient IDs	Other Patient IDs
Patient Comments	Patient Comments

8.1.4 Coerced / Modified Files

Those tags are listed in chapter 4.2.1.3.1 Activity – Query Modality Worklist. Other attributes get lost and are not available in the IOLMaster 500 application.

8.2 Data Dictionary Of Private Attributes

IOLMaster 500 adds specific private attributes. The code scheme designator is 99CZM. The group used is 771B.

99CZM			
Tag	**Name**	**VR**	**VM**
(771b,xx01)	formula_sequence	SQ	1
(771b,xx02)	formula_ntupel_sequence	SQ	1
(771b,xx03)	common_formula_lenses_sequence	SQ	1
(771b,xx04)	common_formula_lenses_sequence_type	CS	1
(771b,xx05)	pair_sequence	SQ	1
(771b,xx06)	name	LO	1
(771b,xx07)	constant	FD	1-4
(771b,xx08)	iol_laterality	CS	1
(771b,xx09)	formula_denominator	LO	1
(771b,xx0a)	lens	LO	1
(771b,xx0b)	al	FD	1
(771b,xx0c)	snr	FD	1
(771b,xx0d)	index_tag	FD	1
(771b,xx0e)	mean_value	FD	1
(771b,xx0f)	r1	FD	1
(771b,xx10)	r2	FD	1
(771b,xx11)	d1	FD	1
(771b,xx12)	d2	FD	1
(771b,xx13)	a1	FD	1
(771b,xx14)	a2	FD	1
(771b,xx15)	zyl	FD	1

(771b,xx16)	refractive_index	FD	1
(771b,xx17)	quali_tag	FD	1
(771b,xx18)	num1	FD	1
(771b,xx19)	num2	FD	1
(771b,xx1a)	num3	FD	1
(771b,xx1b)	num4	FD	1
(771b,xx1c)	num5	FD	1
(771b,xx1d)	wzw	FD	1
(771b,xx1e)	fpx	FD	1
(771b,xx1f)	fpy	FD	1
(771b,xx20)	k1	FD	1
(771b,xx21)	k2	FD	1
(771b,xx22)	se	FD	1
(771b,xx24)	n	FD	1
(771b,xx25)	status	IS	1
(771b,xx26)	acd	FD	1
(771b,xx27)	va	FD	1
(771b,xx28)	ref	FD	1
(771b,xx29)	target_ref	FD	1
(771b,xx2a)	iol	FD	1
(771b,xx2b)	emmetropia	FD	1
(771b,xx2c)	surgeon	LO	1
(771b,xx2d)	warning_notice	LO	1
(771b,xx2e)	surgical_eye	IS	1
(771b,xx2f)	vertex	FD	1
(771b,xx30)	axial_length_values_sequence	SQ	1
(771b,xx31)	axial_length_values_triple_sequence	SQ	1
(771b,xx32)	keratometer_values_sequence	SQ	1
(771b,xx33)	keratometer_values_ntupel_sequence	SQ	1
(771b,xx34)	chamber_depth_values_sequence	SQ	1
(771b,xx35)	white_to_white_sequence	SQ	1
(771b,xx36)	module_formula_sequence	SQ	1
(771b,xx37)	module_haigis-l_sequence	SQ	1
(771b,xx38)	phake_iol_formula_sequence	SQ	1
(771b,xx39)	phake_iol_lenses_sequence	SQ	1
(771b,xx3a)	phake_iol_formula_ntupel_sequence	SQ	1
(771b,xx3b)	white_to_white_values_sequence	SQ	1
(771b,xx40)	sphere	FD	1
(771b,xx41)	cylinder	FD	1
(771b,xx42)	axis	FD	1
(771b,xx43)	mean_value_al	FD	1
(771b,xx44)	mean_value_snr	FD	1
(771b,xx45)	al_modified	CS	1
(771b,xx46)	k_modified	CS	1
(771b,xx48)	acd_modified	CS	1
(771b,xx49)	mean_value_r1	FD	1
(771b,xx4a)	mean_value_d1	FD	1
(771b,xx4b)	mean_value_a1	FD	1
(771b,xx4c)	mean_value_r2	FD	1
(771b,xx4d)	mean_value_d2	FD	1
(771b,xx4e)	mean_value_a2	FD	1
(771b,xx4f)	mean_value_zyl	FD	1
(771b,xx50)	pup	FD	1
(771b,xx51)	pup_fpx	FD	1

(771b,xx52)	pup_fpy	FD	1
(771b,xx53)	lens_database_sequence	SQ	1
(771b,xx54)	lens_sequence	SQ	1
(771b,xx55)	lens_constant_formula_sequence	SQ	1
(771b,xx56)	lens_constant_sequence	SQ	1
(771b,xx57)	lens_constant_name	LO	1
(771b,xx58)	lens_constant_value	FD	1
(771b,xx59)	lens_steps	FD	1
(771b,xx5a)	wtw	FD	1
(771b,xx5b)	wtw_modified	CS	1
(771b,xx5c)	lt	FD	1
(771b,xx5d)	lt_modified	CS	1
(771b,xx5f)	age	FD	1

8.3 Coded Terminology And Templates

For more detailed information on biometry measurement condition, a few additional parameters, not defined in the Ophthalmic Photography IOD, are used. These parameters are stored in the Acquisition Context Sequence as defined below.

The Coding Scheme Designator used for the following parameters is “99CZM_IOLM”:

Coding Name	Coding Type	Meas. Units Code / Values	Code Meaning / Comments
TORIC_ACQ_Q	Numeric Value	Range 0.0:1.0	Quality of the image regarding application of markerless IOL
ACQ_EXP_T	Numeric Value with Unit	Milliseconds	Exposure time during image acquisition
ACQ_ILLUMN	Numberic Value	Range 0:255	Brightness of illuminating LEDs during image acquisition

The Coding Scheme Designator used is “99HIKO” for the following two parameters:

Coding Name	Coding Type	Meas. Units Code / Values	Code Meaning / Comments
PixelWidth	Numeric Value with Unit	Millimeters	PixelWidth of used sensor
PixelHeight	Numeric Value with Unit	Millimeters	PixelHeight of used sensor

8.4 Grayscale Image Constistency

Not applicable.

8.5 Standard Extended / Specialized / Private SOP Classes

Standard Extension of the Encapsulated PDF SOP Class is desribed in chapter 8.1.1.1 Encapsulated PDF Information Object Definition, Module CzmEncapsulatedPdfInstanceExtension.
Neither Specialized or Private SOP Classes are supported.

8.6 Private Transfer Syntaxes

No Private Transfer Syntaxes are supported.

The product satisfies the fundamental requirements laid down in Annex I of the 93/42/EEC Directive governing medical devices. The product is labeled with:

CE 0297

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