CARL ZEISS MEDITEC

DICOM Conformance Statement

VISUCAM® 224 and VISUCAM® 524

Version 6.0.6

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1 Conformance Statement Overview

The VISUCAM Digital Fundus Camera is suitable for photographing, displaying and storing data relating to the retina and surrounding parts of the eye being examined under mydriatic and non-mydriatic conditions. These photographs assist with the diagnosis and follow-up of eye diseases, which can be visually monitored and photographically documented.

The VISUCAM application's DICOM functionality allows to:

- query modality worklist
- archive images
- write and read single DICOM files to and from CD-R/RW, other mass storage devices or network connected file systems

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

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Ophthalmic Photography 8 Bit Image Storage	Yes	No
VL Photographic Image Storage	Yes	No
Workflow Management		
Modality Worklist Information Model - FIND	Yes	No

The VISUCAM application does not support DICOM Media Interchange.

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3 Introduction

3.1 Revision History

Document Version	Author	Date	Changes
I	Patrick A. Nast	09/06/2019	Update reflecting Bug fixes

3.2 Audience

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

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between VISUCAM and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.
This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

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

3.4 Definitions, Terms and Abbreviations

Abbreviation	Definition
AE	Application Entity
AET	Application Entity Title
ANAP	Attribute not always present
C	Conditional
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
JPG-14	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14):
M	Mandatory
MCGN	Multi-Component Group Names
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
U	User Option
UID	Unique Identifier

VNAP	Value not always present
VL	Visible Light

3.5 References

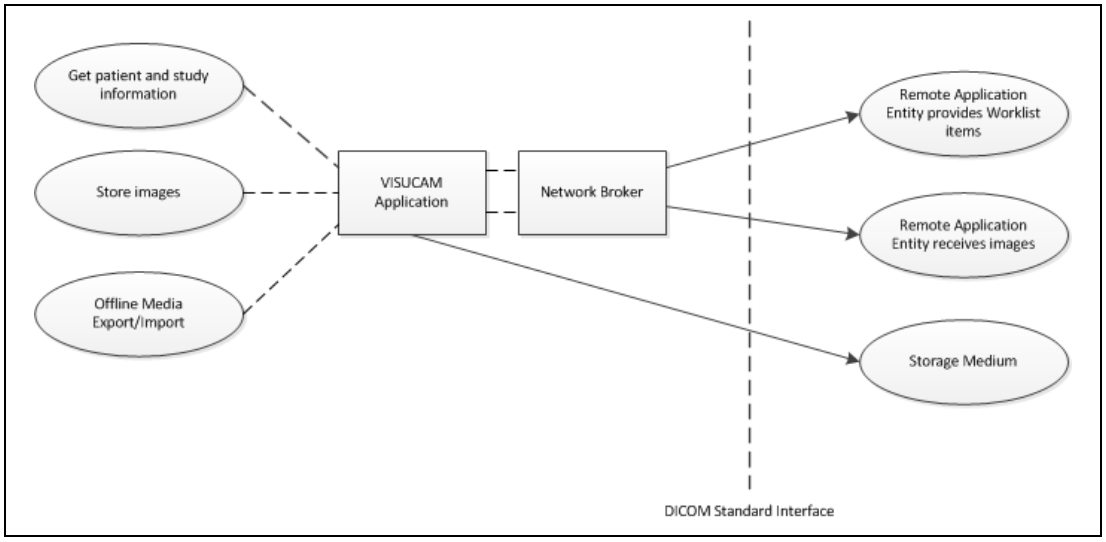
NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at http://medical.nema.org/)

Integrating the Healthcare Enterprise (IHE) EYECARE Technical Framework, rev 4.0, 2016 (available free at http://www.ihe.net/Technical_Framework/index.cfm.

4 Networking

4.1 Implementation Model

4.1.1 Application Data Flow



The VISUCAM Software works together with the Network Broker. Both software applications are hosted on same machine. Thus the User Interface of the Network Broker can be used by an operator which works with the VISUCAM Application.
In addition to this networked mode the VISUCAM Software offers a DICOM Offline Media Storage service which provides the possibility of writing and reading single DICOM files. It provides an interface to CD-R/RW, other mass storage devices and network connected file systems. The VISUCAM software includes a database for configuring and managing parameters for this Offline Media Storage operation.

4.1.2 Functional Definition Of AEs

4.1.2.1 Functional Definition Of VISUCAM AE

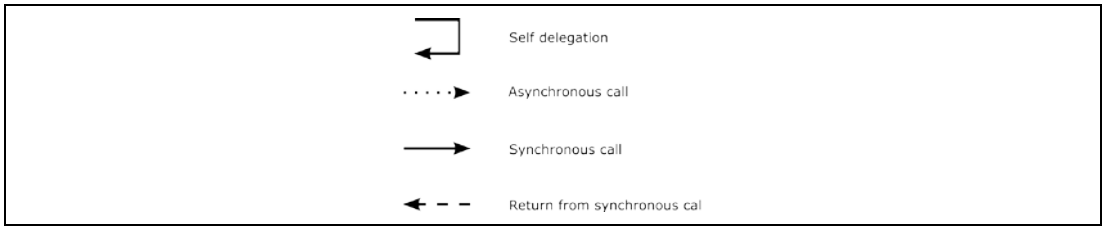
The VISUCAM Digital Fundus Camera is suitable for photographing, displaying and storing data relating to the retina and surrounding parts of the eye being examined under mydriatic and non-mydriatic conditions. These photographs assist with the diagnosis and follow-up of eye diseases, which can be visually monitored and photographically documented.

The VISUCAM application's DICOM functionality allows to:

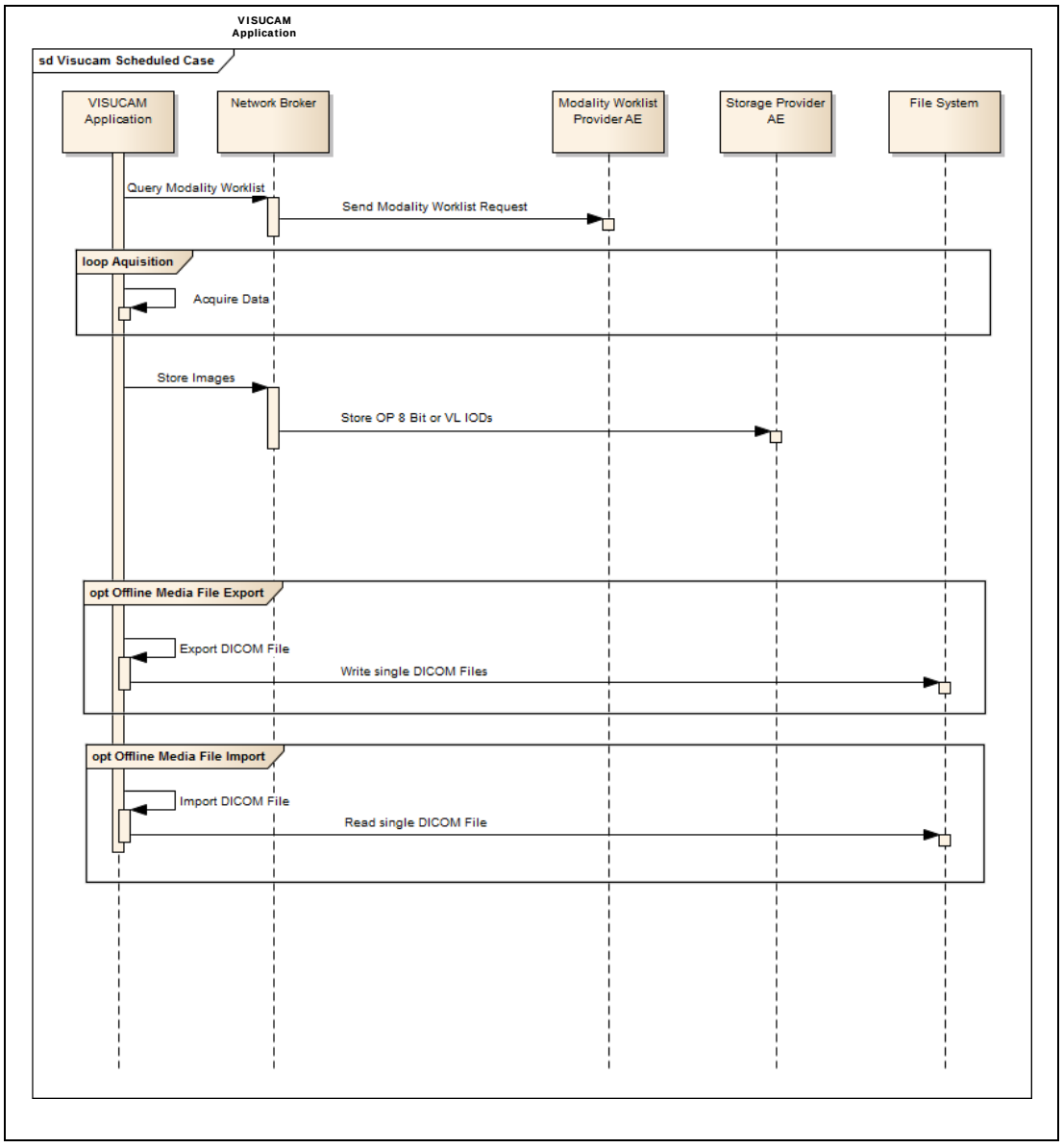
- query modality worklist
- archive images
- write and read single DICOM files to and from CD-R/RW, other mass storage devices or network connected file systems

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 VISUCAM, the operator queries the work list. 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 VISUCAM creates an entry in the local database (Patient, Study, Visit for the current day). Procedure Step related information is kept temporary in the VISUCAM application.
The operator can now select the patient for data acquisition.

Acquire data

The operator acquires data from patient's eye.

Store Images

After finishing the examination, the whole Study can be submitted. The operator can initiate sending images at any time to storage entities.

Write DICOM Files

This is an optional activity which bypasses the Network Broker interface. The VISUCAM application copies SOP Instances from the local storage to local file export medium. Further on, VISUCAM can write DICOM files to network directories. The supported SOP Class for file export is Visible Light Photographic Image Storage.

Read DICOM Files

This is an optional activity which bypasses the Network Broker interface. The VISUCAM application reads SOP Instances from a local mass storage medium or from a network directory. The supported SOP Class for file import is Visible Light Photographic Image Storage.

4.2 AE Specifications

4.2.1 Network Broker Application Entity Specification

4.2.1.1 SOP Classes

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
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	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.

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.

Maximum number of simultaneous associations	2

4.2.1.2.3 Asynchronous Nature

Network Broker does not support asynchronous communication (multiple outstanding transactions over a single Association).

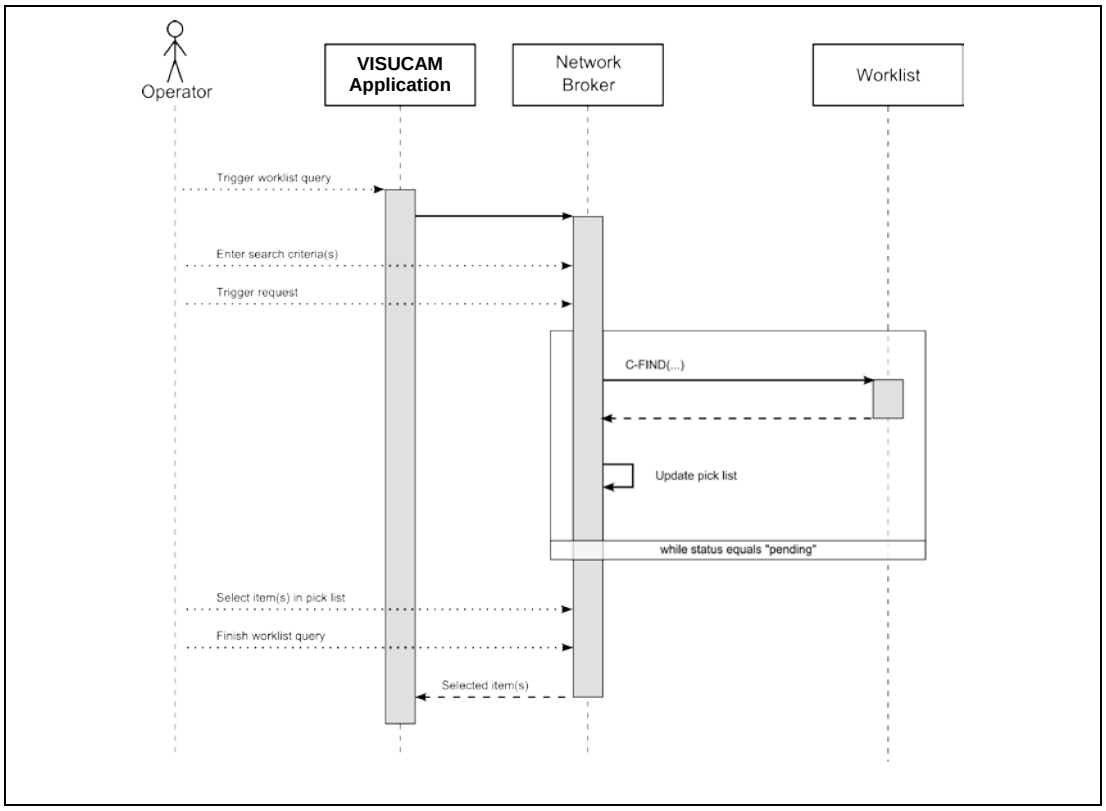
4.2.1.2.4 Implementation Identifying Information

Implementation Class UID	**1.2.276.0.75.2.5.10**
Implementation Version Name	**1.3.8.1526**

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 the operator. It is meaningful to perform the query when the patient comes to the modality, then the worklist contains the latest information.
After triggering the worklist query, the operator can fill in search criteria in the shown dialog. The operator triggers the search after having filled in the search criteria. The Network Broker sends a DICOM request, containing the search criteria as matching query keys. Network Broker waits for the response from the remote Application Entity. After receiving the response, Network Broker updates the pick list with the information included in the Modality Worklist response. The pick list instantly shows the received information. The Network Broker will wait for additional responses as long as the Worklist Provider sends a message status “pending” and the number of already received responses does not overstep 50.
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 VISUCAM Application takes over the selected items. For patients who relate to existing data sets of the local database, the VISUCAM Application asks the operator to update or to keep the information. For patients who do not relate to existing data sets, the VISUCAM Application creates new data sets. Data on Patient, Study and Procedure level are kept in the database. After having selected the scheduled patient, the operator can start the examination and acquire images for the respective studies.
The VISUCAM is capable to deal with the first component group of multi-component group names. When the operator triggers a search of a worklist containing multi-component group names the search will be performed using the first component group only. When the response from the modality worklist provider contains a multi-component group name the pick list will show all the three component groups but just the first component group content will be imported at the modality.

4.2.1.3.1.2 Proposed Presentation Contexts

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

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The Network Broker finishes receiving worklist items. The user can select items in pick list.
Pending	Matches are continuing	FF00, FF01	Network Broker puts received worklist item into the pick list. If the number of received items oversteps 50 then the SCU sends an ABORT to the SCP and the operator gets a request to specify query keys more accurate.
*	*	Any other status code	The status label of the dialog shows an error message.

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		no	no	no	no
(0010,0010)	Patients Name	Yes	Yes (4)	yes	yes	yes
(0010,0020)	Patient ID	Yes	yes	yes	yes	yes
(0010,0021)	Issuer Of Patient ID		yes	yes (1)	no	yes
(0010,0030)	Patients Birth Date		yes	yes	yes	yes
(0010,0040)	Patients Sex		no	no	no	no
(0010,0032)	Patients Birth Time		yes	yes	yes	yes
(0010,1000)	Other Patient IDs		yes	yes	yes	Yes (5)
(0010,1001)	Other Patient Names		no	no	no	no
(0010,2160)	Ethnic Group		no	no	no	no
(0010,4000)	Patient Comments		yes	yes	yes	yes
(0010,2000)	Medical Alerts		yes	yes (1)	no	no
(0010,2110)	Contrast Allergies		yes	yes (1)	no	no
(0010,21C0)	Pregnancy Status		yes	yes (1)	no	no
(0038,0050)	Special Needs		yes	yes (1)	no	no
(0038,0500)	Patient State		yes	yes (1)	no	no
Study						
(0008,0050)	Accession Number	Yes	yes	yes	no	yes
(0008,0090)	Referring Physicians Name		yes	yes	no	yes
(0020,000D)	Study Instance UID		yes	no	no	yes
(0032,1032)	Requesting Physician		yes	yes (1)	no	yes (1)(2)

(0032,4000)	Study Comments		no	no	no	no
Requested Procedure						
(0008,1110)	Referenced Study Sequence		yes	yes (1)	no	yes (1)
(0032,1060)	Requested Procedure Description		yes	yes (1)	no	yes (1)
(0032,1064)	Requested Procedure Code Sequence		yes	yes (1)	no	yes (1)(3)
(0040,1001)	Requested Procedure ID	yes	yes	yes (1)	no	yes (1)
Scheduled Procedure Step (SPS)						
(0040,0100)	Scheduled Procedure Step Sequence					
>(0008,0060)	Modality	yes	yes	yes (1)	no	no
>(0040,0001)	Scheduled Station Application Entity Title	yes	yes	yes (1)	no	no
>(0040,0003)	Scheduled Procedure Step Start Time		yes	yes (1)	no	no
>(0040,0002)	Scheduled Procedure Step Start Date	yes	yes	yes (1)	no	no
>(0040,0006)	Scheduled Performing Physicians Name		yes	yes (1)	no	no
>(0040,0007)	Scheduled Procedure Step Description		yes	yes (1)	no	yes
>(0040,0008)	Scheduled Protocol Code Sequence		yes	yes (1)	no	yes
>(0040,0009)	Scheduled Procedure Step ID		yes	yes (1)	no	yes
(0040,2016)	Placer Order Number Imaging Service Request		no	no	no	no

(1) temporary: as long as MWL-patient is in "waiting room list"
(2) stored as Physisian of record; DICOM tag (0008, 1048)
(3) stored as Procedure Code Sequence; DICOM tag (0008,1032)
(4) in case of MCGN just the first component is imported

(5) Only the first value of the multi-value field is copied

The operator can fill in search criteria as query keys. Network Broker offers two input masks for it.

Following tags are editable as search criteria in input mask "Patient Based Query".

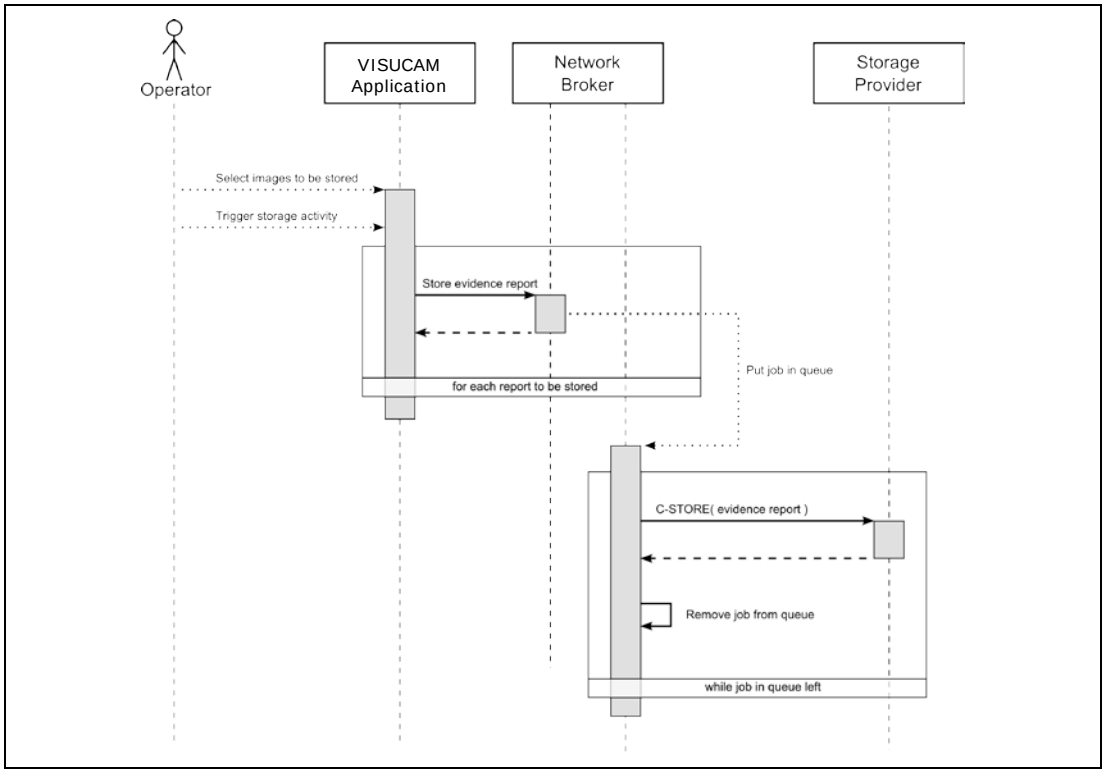
Tag	Description
(0010,0010)	Patients Name
(0010,0020)	Patient ID
(0008,0050)	Accession Number
(0040,1001)	Requested Procedure ID

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

Tag	Description
(0040,0100)	Scheduled Procedure Step Sequence
>(0040,0002)	Scheduled Procedure Step Start Date
>(0008,0060)	Modality
>(0040,0001)	Scheduled Station AE Title

4.2.1.3.2 Activity – Store images

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 images at any time to storage entities.
The VISUCAM Application passes data to the Network Broker. The Network Broker creates immediately DICOM objects and puts a send-job for that DICOM object in a queue. The transmission of the DICOM objects is processed in the background (that means it is performed while operator can continue work with VISUCAM Application).
The storage progress is reflected in a dialog. 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

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	ILE	1.2.840.10008.1.2	SCU	No
		JPG-1	1.2.840.10008.1.2.4.50	SCU	No
		JPG-14	1.2.840.10008.1.2.4.70	SCU	No
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	ILE	1.2.840.10008.1.2	SCU	No
		JPG-1	1.2.840.10008.1.2.4.50	SCU	No
		JPG-14	1.2.840.10008.1.2.4.70	SCU	No

4.2.1.3.2.3 SOP Specific Conformance for Image Storage SOP Class

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 is not configurable by the Network Broker Configuration Tool. The IP is administrated by the Operating System. The calling AET is configurable. The calling AET is the AET of the Network Broker.

4.4.1.2 Remote AE Titles

The mapping of external AE Titles to TCP/IP addresses and ports is configurable. The Network Broker allows setting up one AE as Modality Worklist Provider and one AE as Storage Provider. For both AEs, the host or IP, 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 association initiation timeout is configurable. Default is 10 seconds.
Additionally, for this service file-based parameters are available. The file-based parameter describes a template for DICOM objects which is used to perform the request. Whenever the operator performs a request, the Network Broker loads the template file and creates a DICOM object of it. Then the application fills in values which were typed in by the operator in the current active input mask. A dedicated file contains template information for the Modality Worklist Query. By default, the file looks like this:

```
#Specific Character Set
(0008,0005)

#Scheduled Procedure Step Sequence
```

```
#(0040,0100)
#Scheduled Station AE Title
(0040,0100)[0]>(0040,0001)
#Scheduled Step Start Date
(0040,0100)[0]>(0040,0002)
#Scheduled Step Start Time
(0040,0100)[0]>(0040,0003)
#Modality
(0040,0100)[0]>(0008,0060)
#Scheduled Performing Physicians Name
(0040,0100)[0]>(0040,0006)
#Scheduled Procedure Step Description
(0040,0100)[0]>(0040,0007)
#Scheduled Station Name
(0040,0100)[0]>(0040,0010)
#Scheduled Procedure Step Location
(0040,0100)[0]>(0040,0011)

#Scheduled Action Item Code Sequence
#(0040,0100)>(0040,0008)
#Code Value (Sequence)
(0040,0100)[0]>(0040,0008)[0]>(0008,0100)
#Coding Scheme Version
(0040,0100)[0]>(0040,0008)[0]>(0008,0103)
#Coding Scheme Designator
(0040,0100)[0]>(0040,0008)[0]>(0008,0102)
#Coding Meaning
(0040,0100)[0]>(0040,0008)[0]>(0008,0104)

#Pre-Medication
(0040,0100)[0]>(0040,0012)
#Scheduled Procedure Step ID
(0040,0100)[0]>(0040,0009)
#Requested Contrast Agent
(0040,0100)[0]>(0032,1070)
#Requested Procedure Step Status
(0040,0100)[0]>(0040,0020)

#Requested Procedure ID
(0040,1001)
#Requested Procedure Description
(0032,1060)

#Requested Procedure Code Sequence
#(0032,1064)
#Code Value
(0032,1064)[0]>(0008,0100)
#Coding Scheme Designator
(0032,1064)[0]>(0008,0102)
#Coding Scheme Version
(0032,1064)[0]>(0008,0103)
#Code Meaning
(0032,1064)[0]>(0008,0104)

#Study Instance UID
(0020,000D)
#Study Comments
(0032,4000)

#Referenced Study Sequence
#(0008,1110)
#Referenced SOP Class UID
(0008,1110)[0]>(0008,1150)
#Referenced SOP Instance UID
(0008,1110)[0]>(0008,1155)

#Requested Procedure Priority
(0040,1003)
#Patient Transport Arragnements
(0040,1004)
#Accession Number
(0008,0050)
#Requesting Physician
```

```
(0032,1032)
#Referring Physician's Name
(0008,0090)
#Placer Order Number / Imaging Service Request
(0040,2016)
#Admission ID
(0038,0010)
#Current Patient Location
(0038,0300)

#Referenced Patient Sequence
#(0008,1120)
#Referenced SOP Class UID
(0008,1120)[0]>(0008,1150)
#Referenced SOP Instance UID
(0008,1120)[0]>(0008,1155)

#Patient's Name
(0010,0010)
#Patient ID
(0010,0020)
#Issuer of Patient ID
(0010,0021)
#Other Patient IDs
(0010,1000)
#Other Patient Names
(0010,1001)
#Patients Birth Date
(0010,0030)
#Patients Birth Time
(0010,0032)
#Patient's Sex
(0010,0040)
#Patients's Weight
(0010,1030)
#Confidentiality constraint on patient data
(0040,3001)
#Patient State
(0038,0500)
#Ethnic Group
(0010,2160)
#Patient Comments
(0010,4000)
#Pregnancy Status
(0010,21C0)
#Medical Alerts
(0010,2000)
#Contrast Allergies
(0010,2110)
#Special Needs
(0038,0050)
```

4.4.2.3 Storage SCU Parameters

The association initiation timeout is configurable. Default is 10 seconds.

For VISUCAM the selectable compressions for the IODs are:

- VL Photographic
  - No Compression
  - JPEG Baseline Compression
  - JPEG Lossless Compression
- Ophthalmic Photography 8 Bit
  - No Compression
  - JPEG Baseline Compression
  - JPEG Lossless Compression

o

4.4.2.4 Offline Media Storage (Import/Export)

4.4.2.4.1 Acquisition Context Settings

For switching between Acquisition Context Coding scheme versions, when creating a DICOM File, the following VISUCAM MainU.ini file entry is used:

[Import/Export]
VISUPAC=0/1

Meaning:
VISUPAC DICOM Compatibility
0: VISUPAC 3.5 and older -> Coding Scheme Version VP3.2
1: VISUPAC 4.0 and newer -> Coding Scheme Version VP4.0

Default Value: 1

4.4.2.4.2 Transfer Syntax Settings

This setting affects DICOM file creation and can be set either via GUI Settings Screen -> Export file format (JPEG compressed check box) or via VISUCAM MainU.ini. Per Default the JPEG compressed check box is unchecked.

[Import/Export]
DICOMTransferSyntax=0/1

Meaning:
0: Little Endian uncompressed -> Transfer Syntax: 1.2.840.10008.1.2
1: JPEG Baseline compressed -> Transfer Syntax: 1.2.840.10008.1.2.4.50

Default Value: 0

5 Media Interchange

Media Interchange is not scope of this document since Media Interchange is not supported via Network Broker.
For further information on DICOM Offline Media Storage (export and import) see chapters 4.1.1 Application Data Flow, 4.1.2 Functional Definition Of AEs, 4.4.2.4 Offline Media Storage (Import/Export) and 8.1.1.3 Visible Light Photographic Image (Offline Media Storage).

6 Support of Character Sets

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

Supported Specific Character Set	
Character Set Description	Defined Term
Latin alphabet No. 1	ISO_IR 192

7 Security

The DICOM capabilities of the VISUCAM Application do not support any specific security measures. It is assumed that VISUCAM 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 VISUCAM Application.
- Firewall or router protections to ensure that VISUCAM 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 are grayed out.

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:

USER
Attribute value is generated from user input.

AUTO
Attribute value is generated automatically.

MWL
Attribute value is the same as the value received using a DICOM service such as Modality Worklist

CONFIG
Attribute value is a configurable parameter.

8.1.1.1 Ophthalmic Photography Image IOD (via Network Broker)

A.41.3 Ophthalmic Photography 8 Bit Image IOD Modules					
	Table A.41-1 OPHTHALMIC PHOTOGRAPHY 8 BIT IMAGE IOD MODULES				
		IE	Module	Reference	Usage
		Patient	Patient	C.7.1.1	ALWAYS
		Study	General Study	C.7.2.1	ALWAYS
			Patient Study	C.7.2.2	NEVER
		Series	General Series	C.7.3.1	ALWAYS
			Ophthalmic Photography Series	C.8.17.1	ALWAYS
		Frame of Reference	Synchronization	C.7.4.2	ALWAYS
		Equipment	General Equipment	C.7.5.1	ALWAYS
		Image	General Image	C.7.6.1	ALWAYS
			Image Pixel	C.7.6.3	ALWAYS
			Acquisition Context	C.7.6.14	ALWAYS
			Enhanced Contrast/Bolus	C 7.6.4b	CONDITIONAL - Included if contrast was administered
			Cine	C.7.6.5	ALWAYS
			Multi-frame	C.7.6.6	ALWAYS
			Ophthalmic Photography Image	C.8.17.2	ALWAYS

			Ocular Region Imaged	C.8.17.5	ALWAYS
			Ophthalmic Photography Acquisition Parameters	C.8.17.4	ALWAYS
			Ophthalmic Photographic Parameters	C.8.17.3	ALWAYS
			SOP Common	C.12.1	ALWAYS

		Tag	VR	Name	Value	PoV	Source
Information Entity 'Patient'							
	Module 'Patient'						
		(0010,0010)	PN	Patient's Name	Patient's full name.	VNAP	MWL, USER
		(0010,0020)	LO	Patient ID	Primary hospital identification number or code for the patient.	VNAP	MWL, USER
		(0010,0021)	LO	Issuer of Patient ID	Identifier of the Assigning Authority that issued the Patient ID.	ANAP	MWL
		(0010,0030)	DA	Patient's Birth Date	Birth date of the patient.	VNAP	MWL, USER
		(0010,0040)	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	MWL, USER
		(0010,1000)	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient. Note: Only the first value of this multi-valued attribute is copied from MWL	ANAP	MWL
		(0010,4000)	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, USER
Information Entity 'Study'							
	Module 'General Study'						
		(0008,0020)	DA	Study Date	Date the Study started.	ALWAYS	AUTO
		(0008,0030)	TM	Study Time	Time the Study started.	ALWAYS	AUTO
		(0008,0050)	SH	Accession Number	A RIS generated number that identifies the order for the Study.	VNAP	MWL
		(0008,0090)	PN	Referring Physician's Name	Name of the patient's referring physician	VNAP	MWL
		(0008,1030)	LO	Study Description	Institution-generated description or classification of the Study (component) performed. In the scheduled case the value is copied from Modality Worklist attribute Requested Procedure Description.	ANAP	MWL

	(0008,1032)	SQ	Procedure Code Sequence	A Sequence that conveys the type of procedure performed. One or more Items may be included in this Sequence. Included macro 'Code Sequence Macro', context 'No Baseline Context ID is defined.'	ANAP	MWL
	>(0008,0100)	SH	Code Value	See Section 8.1. Required if a sequence item is present.	ALWAYS	MWL
	>(0008,0102)	SH	Coding Scheme Designator	See Section 8.2. Required if a sequence item is present.	ALWAYS	MWL
	>(0008,0103)	SH	Coding Scheme Version	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	MWL
	>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	MWL
	(0008,1048)	PN	Physician(s) of Record	Names of the physician(s) who are responsible for overall patient care at time of Study (see Section C.7.3.1 for Performing Physician) Requesting physician's name is copied from MWL.	ANAP	MWL, AUTO
	(0008,1110)	SQ	Referenced Study Sequence	A sequence that provides reference to a Study SOP Class/Instance pair. The sequence may have zero or more Items.	ANAP	MWL
	>(0008,1150)	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class. Required if Referenced Study Sequence (0008,1110) is sent.	ANAP	MWL
	>(0008,1155)	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance. Required if Referenced Study Sequence (0008,1110) is sent.	ANAP	MWL
	(0020,000D)	UI	Study Instance UID	Unique identifier for the Study. In the unscheduled case VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.1." followed by a date/time	ALWAYS	AUTO, MWL

				stamp and a machine specific identifier.		
	(0020,0010)	SH	Study ID	User or equipment generated Study identifier.	ALWAYS	AUTO
Information Entity 'Series'						
Module 'General Series'						
	(0008,0021)	DA	Series Date	Date the Series started.	ALWAYS	AUTO
	(0008,0031)	TM	Series Time	Time the Series started.	ALWAYS	AUTO
	(0008,1050)	PN	Performing Physicians' Name	Name of the physician(s) administering the Series.	ANAP	CONFIG
	(0008,1070)	PN	Operators' Name	Name(s) of the operator(s) supporting the Series.	ANAP	CONFIG
	(0018,0015)	CS	Body Part Examined	"HEAD"	ALWAYS	AUTO
	(0018,1030)	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).	EMPTY	
	(0018,5100)	CS	Patient Position	Patient position descriptor relative to the equipment. Required for CT and MR images; shall not be present if Patient Orientation Code Sequence (0054,0410) is present; may be present otherwise. See C.7.3.1.1.2 for Defined Terms and further explanation.	EMPTY	
	(0020,000E)	UI	Series Instance UID	VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.2." followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO
	(0020,0011)	IS	Series Number	A number that identifies this Series.	ALWAYS	AUTO
	(0040,0244)	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started.	ALWAYS	AUTO
	(0040,0245)	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started.	ALWAYS	AUTO
	(0040,0253)	SH	Performed Procedure Step ID	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.	ALWAYS	AUTO

	(0040,0254)	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed.	EMTPY	
	(0040,0275)	SQ	Request Attributes Sequence	Sequence that contains attributes from the Imaging Service Request. The sequence may have one or more Items. Included macro 'Request Attributes Macro', context 'No Baseline Context IDs defined'	ANAP	MWL
	>(0032,1060)	LO	Requested Procedure Description	Institution-generated administrative description or classification of Requested Procedure.	ANAP	MWL
	>(0040,0007)	LO	Scheduled Procedure Step Description	Institution-generated description or classification of the Scheduled Procedure Step to be performed.	ANAP	MWL
	>(0040,0008)	SQ	Scheduled Protocol Code Sequence	Sequence describing the Scheduled Protocol following a specific coding scheme. This sequence contains one or more Items. Included macro 'Code Sequence Macro', context 'Context ID may be defined in the macro invocation.'	ANAP	MWL
	>>(0008,0100)	SH	Code Value	See Section 8.1. Required if a sequence item is present.	ALWAYS	MWL
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.2. Required if a sequence item is present.	ALWAYS	MWL
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	MWL
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	MWL
	>(0040,0009)	SH	Scheduled Procedure Step ID	Identifier that identifies the Scheduled Procedure Step.	ANAP	MWL
	>(0040,1001)	SH	Requested Procedure ID	Identifier that identifies the Requested Procedure in the Imaging Service Request.	ANAP	MWL
Module 'Ophthalmic Photography Series'						
	(0008,0060)	CS	Modality	“OP”	ALWAYS	AUTO
Information Entity 'Frame of Reference'						
Module 'Synchronization'						

	(0018,106A)	CS	Synchronization Trigger	“NO TRIGGER” - data acquisition is not synchronized by common channel or trigger.	ALWAYS	AUTO
	(0018,1800)	CS	Acquisition Time Synchronized	“N “ - Acquisition Datetime (0008,002A) is not synchronized with external time reference.	ALWAYS	AUTO
	(0020,0200)	UI	Synchronization Frame of Reference UID	The UID is valid from Instrument Application’s start-up til shut down. The internal clock can be adjusted by service personel only. After adjusting the internal clock, the service member restarts the Instrument Application. So it is guaranteed the UID represents one single Synchronization Frame of Reference. VISUCAM uses a constant prefix of “1.2.276.0.75.2.5.10.1.2.” followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO
Information Entity 'Equipment'						
Module 'General Equipment '						
	(0008,0070)	LO	Manufacturer	“Carl Zeiss Meditec AG”	ALWAYS	AUTO
	(0008,0080)	LO	Institution Name	Institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
	(0008,0081)	ST	Institution Address	Mailing address of the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
	(0008,1010)	SH	Station Name	User defined name identifying the machine that produced the composite instances.	ANAP	CONFIG
	(0008,1040)	LO	Institutional Department Name	Department in the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
	(0008,1090)	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances. “VISUCAM 224” or “VISUCAM 524”	ALWAYS	AUTO
	(0018,1000)	LO	Device Serial Number	Manufacturer's serial number of the equipment that produced the composite instances. Note: This identifier	ALWAYS	AUTO

				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.		
	(0018,1020)	LO	Software Versions	Manufacturer's designation of software version of the equipment that produced the composite instances. Always “6.0.6.67065” and higher versions "6.0.x.y" where x denotes a patch version and y denotes a build version	ALWAYS	AUTO
Information Entity 'Image'						
Module 'General Image'						
	(0008,0022)	DA	Acquisition Date	The date the acquisition of data that resulted in this image started	ALWAYS	AUTO
	(0008,0032)	TM	Acquisition Time	The time the acquisition of data that resulted in this image started	ALWAYS	AUTO
	(0020,0020)	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). See C.7.6.1.1.1 for further explanation. Note: IOD's may have attributes other than Patient Orientation, Image Orientation, or Image Position (Patient) to describe orientation in which case this attribute will be zero length. Always “L/F”	ALWAYS	AUTO
	(0020,4000)	LT	Image Comments	User-defined comments about the image	VNAP	USER
Module 'Image Pixel'						
	(0028,0010)	US	Rows	Number of rows in the image.	ALWAYS	AUTO
	(0028,0011)	US	Columns	Number of columns in the image.	ALWAYS	AUTO
	(0028,0100)	US	Bits Allocated	“8”	ALWAYS	AUTO
	(0028,0101)	US	Bits Stored	“8”	ALWAYS	AUTO

	(0028,0102)	US	High Bit	“7”	ALWAYS	AUTO
	(7FE0,0010)	OW /OB	Pixel Data		ALWAYS	AUTO
Module 'Acquisition Context'						
	(0040,0555)	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
	>(0040,08EA)	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. Included macro 'Code Sequence Macro', context 'Baseline Context ID is 82. '	ANAP	AUTO
	>>(0008,0100)	SH	Code Value	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.3. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>(0040,A043)	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. Included macro 'Code Sequence Macro', context 'No Baseline Context is defined.'	ANAP	AUTO
	>>(0008,0100)	SH	Code Value	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.3. Required if a sequence item is present and the value of Coding Scheme Designator	ANAP	AUTO

				(0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.		
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>(0040,A30A)	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.	ANAP	AUTO
	>(0040,A122)	TM	Time	This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a time. Note The purpose or role of the time value could be specified in Concept Name Code Sequence (0040,A043). Required if the value that Concept Name Code Sequence (0040,A043) requires (implies) is a time. Shall not be present otherwise. Attribute exists for the concepts “FA start time” and “ICG start time”	ANAP	AUTO
	>(0040,A168)	SQ	Concept Code Sequence	This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a Coded Value. Only a single Item shall be included in this sequence. Required if Date (0040,A121), Time (0040,A122), Person Name (0040,A123), Text Value (0040,A160), and the pair of Numeric Value (0040,A30A) and Measurement Units	ANAP	AUTO

				Code Sequence (0040,08EA) are not present. Attribute exits for the concepts “Imaging agent”, “Sensor” and “Protocol name”		
	>>(0008,0100)	SH	Code Value	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.3. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
Module 'Enhanced Contrast/Bolus'						
	(0018,0012)	SQ	Contrast/Bolus Agent Sequence	Contains zero or one item. Sequence that identifies one or more contrast agents administered prior to or during the acquisition. Shall contain one or more Items. Included macro 'Code Sequence Macro', context 'Baseline Context ID is 12.' Only included in case of FA or ICG acquisition.	ANAP	AUTO
	>(0008,0100)	SH	Code Value	“C-B02CC” for FA or “C-B0156” for ICG	ALWAYS	AUTO
	>(0008,0102)	SH	Coding Scheme Designator	“SRT”	ALWAYS	AUTO
	>(0008,0103)	SH	Coding Scheme Version	“20040921”	ALWAYS	AUTO
	>(0008,0104)	LO	Code Meaning	“Fluorescein” for FA or “Indocyanin green” for ICG	ALWAYS	AUTO
	>(0018,0014)	SQ	Contrast/Bolus Administration Route Sequence	Contains one item. Sequence that identifies the route of administration of contrast agent. Shall contain exactly one Item. Included macro 'Code Sequence Macro', context 'Baseline Context ID is 11.'	ALWAYS	AUTO

				Only included in case of FA or ICG acquisition.		
	>>(0008,0100)	SH	Code Value	“G-D101”	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	“SNM3”	ALWAYS	AUTO
	>>(0008,0104)	LO	Code Meaning	“Intravenous route”	ALWAYS	AUTO
	>(0018,1041)	DS	Contrast/Bolus Volume	Exists for conformance, but empty.	EMPTY	AUTO
	>(0018,1041)	DS	Contrast/Bolus Volume	Exists for conformance, but empty.	EMPTY	AUTO
	>(0018,9337)	US	Contrast/Bolus Agent Number	“1” because at maximum there is one item in this sequence.	ALWAYS	AUTO
	>(0018,9338)	SQ	Contrast/Bolus Ingredient Code Sequence	Exists for conformance, but empty. Active ingredient of agent. Zero or more Items may be included in the Sequence. Included macro 'Code Sequence Macro', context 'Baseline Context ID is 13.'	EMPTY	AUTO
	>(0018,9340)	SQ	Contrast Administration Profile Sequence	Contains one item. Sequence that describes one or more phases of contrast administered. If present, shall contain one or more Items.	ALWAYS	AUTO
	>>(0018,1041)	DS	Contrast/Bolus Volume	Exists for conformance, but empty. Volume administered during this phase in milliliters of diluted contrast agent.	EMPTY	AUTO
	>>(0018,1042)	TM	Contrast/Bolus Start Time	Time of start of administration.	ALWAYS	AUTO
Module 'Cine'						
	(0018,1063)	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. “0”	ALWAYS	AUTO
Module 'Multi-frame'						
	(0028,0008)	IS	Number of Frames	“1” – the VISUCAM does not create multi-frame images	ALWAYS	AUTO
	(0028,0009)	AT	Frame Increment	“(0018,1063)”	ALWAYS	AUTO

	Pointer				
Module 'Ophthalmic Photography Image'					
(0008,0008)	CS	Image Type	Image identification characteristics. Multi-value attribute containing 4 values: 1) Pixel Data Characteristics • "ORIGINAL" for original acquired images • "DERIVED" for any derived image 2) Patient Examination Characteristics • "PRIMARY" or "SECONDARY" 3) Modality Specific Characteristics • "MONTAGE" for panorama images • empty otherwise 4) Implementation specific identifiers(according to selected capture mode) • "COLOR", "REDFREE", "RED", "BLUE", "AF", "FA"[1], "ICG"[1] [1]: only available for VISUCAM 524	ALWAYS	AUTO
(0008,0023)	DA	Content Date	The date the image pixel data creation started.	ALWAYS	AUTO
(0008,002A)	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	AUTO
(0008,0033)	TM	Content Time	The time the image pixel data creation started.	ALWAYS	AUTO
(0008,2112)	SQ	Source Image Sequence	A Sequence that identifies the set of Image SOP Class/Instance pairs of the Images that were used to derive this Image. Required if Image Type Value 1 is DERIVED. Zero or more items may be present in the	EMPTY	

				sequence. See C.7.6.1.1.4 for further explanation. Included macro 'Image SOP Instance Reference Macro', context '' Always empty sequence.		
	(0020,0013)	IS	Instance Number	A number that identifies this image.	ALWAYS	AUTO
	(0028,0002)	US	Samples per Pixel	“1” – for monochrome images “3” – for color images	ALWAYS	AUTO
	(0028,0004)	CS	Photometric Interpretation	“MONOCHROME2” – for monochrome images. “RGB” – for color images. “YBR_FULL_422” – for JPEG Baseline compressed images.	ALWAYS	CONFIG AUTO
	(0028,0006)	US	Planar Configuration	“0” - color-by-pixel Exists if Samples per Pixel (0028,0002) has a value greater than 1.	ANAP	AUTO
	(0028,0030)	DS	Pixel Spacing	Present because Acquisition Device Type Code Sequence (0022,0015) contains an item with the value (SRT, R-1021A, "Fundus Camera"). Values depend on choosen visible angle.	ALWAYS	AUTO
	(0028,0103)	US	Pixel Representation	“0”	ALWAYS	AUTO
	(0028,0301)	CS	Burned In Annotation	“YES”	ALWAYS	AUTO
	(0028,2110)	CS	Lossy Image Compression	Specifies whether an Image has undergone lossy compression (at a point in its lifetime). “00” - Image has not been subjected to lossy compression. “01” - Image has been subjected to lossy compression. Always “01”	ALWAYS	CONFIG AUTO
	(0028,2112)	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	ANAP	CONFIG AUTO

				with a single value of 30. 2. For historical reasons, the lossy compression ratio may also be described in Derivation Description (0008,2111). Required if Lossy Image Compression (0028,2110) has a value of "01".		
	(0028,2114)	CS	Lossy Image Compression Method	"ISO_10918_1" or "ISO_10918_1\ ISO_10918_1"* *Multi-valued in case of compression is enabled for DICOM storage.	ANAP	CONFIG AUTO
	(2050,0020)	CS	Presentation LUT Shape	"IDENTITY" – Exists if Photometric Interpretation (0028,0004) is "MONOCHROME2"	ANAP	AUTO
Module 'Ocular Region Imaged'						
	(0008,2218)	SQ	Anatomic Region Sequence	One item present *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)	SH	Code Value	"T-AA000"	ALWAYS	AUTO
	>(0008,0102)	SH	Coding Scheme Designator	"SRT"	ALWAYS	AUTO
	>(0008,0104)	LO	Code Meaning	"Eye"	ALWAYS	AUTO
	(0020,0062)	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	ALWAYS	AUTO

				rarely be present.		
Module 'Ophthalmic Photography Acquisition Parameters'						
	(0022,0005)	CS	Patient Eye Movement Commanded	Empty, exists because of conformance.	EMPTY	
	(0022,000A)	FL	Emmetropic Magnification	Empty, exists because of conformance. *Emmetropic Magnification value (dimensionless). Zero length means the emmetropic magnification was not measured.*	EMPTY	AUTO
	(0022,000B)	FL	Intra Ocular Pressure	Empty, exists because of conformance. *Value of pressure. Value in mmHg. Zero length means the pressure was not measured.*	EMPTY	
	(0022,000C)	FL	Horizontal Field of View	The horizontal field of view in degrees EMPTY in case of (0008,0008) Image Type has value "DERIVED\PRIMARY\MONTAGE"	ALWAYS	AUTO
	(0022,000D)	CS	Pupil Dilated	If this tag is empty, no information is available.	EMPTY	
	(0022,001B)	SQ	Refractive State Sequence	Contains no item. Exists because of conformance.	EMPTY	
Module 'Ophthalmic Photographic Parameters'						
	(0018,7004)	CS	Detector Type	Empty. *Type of detector used for creating this image. Defined terms: CCD = Charge Coupled Devices CMOS = Complementary Metal Oxide Semiconductor*	EMPTY	
	(0022,0015)	SQ	Acquisition Device Type Code Sequence	One item. *Describes the type of acquisition device. A single item shall be present in the sequence.* *Included macro 'Code Sequence Macro', context ' Baseline Context ID is 4202'*	ALWAYS	AUTO
	>(0008,0100)	SH	Code Value	"R-1021A"	ALWAYS	AUTO

	>(0008,0102)	SH	Coding Scheme Designator	"SRT"	ALWAYS	AUTO
	>(0008,0104)	LO	Code Meaning	"Fundus Camera"	ALWAYS	AUTO
	(0022,0016)	SQ	Illumination Type Code Sequence	Contains no item. Exists because of conformance. *Coded value for illumination. Zero or one item shall be present in the sequence. Included macro 'Code Sequence Macro', context ' Baseline Context ID is 4203'*	EMPTY	
	(0022,0017)	SQ	Light Path Filter Type Stack Code Sequence	Contains no item. Exists because of conformance. *Filters used in the light source path. Zero or more items may be present in the sequence. Included macro 'Code Sequence Macro', context ' Baseline Context ID is 4204'*	EMPTY	
	(0022,0018)	SQ	Image Path Filter Type Stack Code Sequence	Contains no item. Exists because of conformance. *Describes stack of filters used in image path. Zero or more items may be present in the sequence. Included macro 'Code Sequence Macro', context ' Baseline Context ID is 4204'*	EMPTY	
	(0022,0019)	SQ	Lenses Code Sequence	Contains no item. Exists because of conformance. *Lenses that were used during the image acquisition. Zero or more items may be present in the sequence. Included macro 'Code Sequence Macro', context ' Baseline Context ID is 4205'*	EMPTY	
Module 'SOP Common'						
	(0008,0005)	CS	Specific Character Set	ISO_IR 192 Character Set that expands or replaces the Basic Graphic Set.	ALWAYS	AUTO
	(0008,0016)	UI	SOP Class UID	"1.2.840.10008.5.1.4.1.1.77 .1.5.1"	ALWAYS	AUTO
	(0008,0018)	UI	SOP Instance UID	Uniquely identifies the SOP Instance. VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.3."	ALWAYS	AUTO

					followed by a date/time stamp and a machine specific identifier.		

8.1.1.2 Visible Light Photographic Image IOD (via Network Broker)

A.32.4 VL Photographic Image Information Object Definition				
Table A.32.4-1 VL PHOTOGRAPHIC IMAGE IOD MODULES				
IE	Module	Reference	Usage	
Patient	Patient	C.7.1.1	ALWAYS	
Study	General Study	C.7.2.1	ALWAYS	
	Patient Study	C.7.2.2	NEVER	
Series	General Series	C.7.3.1	ALWAYS	
Equipment	General Equipment	C.7.5.1	ALWAYS	
Image	General Image	C.7.6.1	ALWAYS	
	Image Pixel	C.7.6.3	ALWAYS	
	Acquisition Context	C.7.6.14	ALWAYS	
	VL Image	C.8.12.1	ALWAYS	
	SOP Common	C.12.1	ALWAYS	

Tag	VR	Name	Value	PoV	Source
Information Entity 'Patient'					
Module 'Patient'					
(0010,0010)	PN	Patient's Name	Patient's full name.	VNAP	MWL, USER
(0010,0020)	LO	Patient ID	Primary hospital identification number or code for the patient.	VNAP	MWL, USER
(0010,0021)	LO	Issuer of Patient ID	Identifier of the Assigning Authority that issued the Patient ID.	ANAP	MWL
(0010,0030)	DA	Patient's Birth Date	Birth date of the patient.	VNAP	MWL, USER
(0010,0040)	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	MWL, USER
(0010,1000)	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient. Note: Only the first value of this multi-valued attribute is copied from MWL	ANAP	MWL
(0010,4000)	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, USER
Information Entity 'Study'					
Module 'General Study'					
(0008,0020)	DA	Study Date	Date the Study started.	ALWAYS	AUTO
(0008,0030)	TM	Study Time	Time the Study started.	ALWAYS	AUTO
(0008,0050)	SH	Accession Number	A RIS generated number	VNAP	MWL

				that identifies the order for the Study.		
	(0008,0090)	PN	Referring Physician's Name	Name of the patient's referring physician	VNAP	MWL
	(0008,1030)	LO	Study Description	Institution-generated description or classification of the Study (component) performed. In the scheduled case the value is copied from Modality Worklist attribute Requested Procedure Description.	ANAP	MWL
	(0008,1032)	SQ	Procedure Code Sequence	A Sequence that conveys the type of procedure performed. One or more Items may be included in this Sequence. Included macro 'Code Sequence Macro', context 'No Baseline Context ID is defined.'	ANAP	MWL
	>(0008,0100)	SH	Code Value	See Section 8.1. Required if a sequence item is present.	ALWAYS	MWL
	>(0008,0102)	SH	Coding Scheme Designator	See Section 8.2. Required if a sequence item is present.	ALWAYS	MWL
	>(0008,0103)	SH	Coding Scheme Version	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	MWL
	>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	MWL
	(0008,1048)	PN	Physician(s) of Record	Names of the physician(s) who are responsible for overall patient care at time of Study (see Section C.7.3.1 for Performing Physician) Requesting physician's name is copied from MWL.	ANAP	MWL, AUTO
	(0008,1110)	SQ	Referenced Study Sequence	A sequence that provides reference to a Study SOP Class/Instance pair. The sequence may have zero or more Items.	ANAP	MWL
	>(0008,1150)	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class. Required if Referenced Study Sequence	ALWAYS	MWL

				(0008,1110) is sent.		
	>(0008,1155)	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance. Required if Referenced Study Sequence (0008,1110) is sent.	ALWAYS	MWL
	(0020,000D)	UI	Study Instance UID	In the unscheduled case VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.1.“ followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO, MWL
	(0020,0010)	SH	Study ID	User or equipment generated Study identifier.	ALWAYS	AUTO
Information Entity 'Series'						
Module 'General Series'						
	(0008,0021)	DA	Series Date	Date the Series started.	ALWAYS	AUTO
	(0008,0031)	TM	Series Time	Time the Series started.	ALWAYS	AUTO
	(0008,0060)	CS	Modality	“XC”	ALWAYS	AUTO
	(0008,1050)	PN	Performing Physicians' Name	Name of the physician(s) administering the Series.	ANAP	CONFIG
	(0008,1070)	PN	Operators' Name	Name(s) of the operator(s) supporting the Series.	ANAP	CONFIG
	(0018,0015)	CS	Body Part Examined	“HEAD”	ALWAYS	AUTO
	(0018,1030)	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).	EMPTY	
	(0018,5100)	CS	Patient Position	Patient position descriptor relative to the equipment. Required for CT and MR images; shall not be present if Patient Orientation Code Sequence (0054,0410) is present; may be present otherwise. See C.7.3.1.1.2 for Defined Terms and further explanation.	EMPTY	
	(0020,000E)	UI	Series Instance UID	VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.2.“ followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO

	(0020,0011)	IS	Series Number	A number that identifies this Series.	ALWAYS	AUTO
	(0020,0060)	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.	ALWAYS	AUTO
	(0040,0244)	DA	Performed Procedure Step Start Date	Date on which the Performed Procedure Step started.	ALWAYS	AUTO
	(0040,0245)	TM	Performed Procedure Step Start Time	Time on which the Performed Procedure Step started.	ALWAYS	AUTO
	(0040,0253)	SH	Performed Procedure Step ID	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.	ALWAYS	AUTO
	(0040,0254)	LO	Performed Procedure Step Description	Institution-generated description or classification of the Procedure Step that was performed.	EMPTY	
	(0040,0275)	SQ	Request Attributes Sequence	Sequence that contains attributes from the Imaging Service Request. The sequence may have one or more Items. Included macro 'Request Attributes Macro', context 'No Baseline Context IDs defined'	ANAP	MWL
	>(0032,1060)	LO	Requested Procedure Description	Institution-generated administrative description or classification of Requested Procedure.	ANAP	MWL
	>(0040,0007)	LO	Scheduled Procedure Step Description	Institution-generated description or classification of the Scheduled Procedure Step to be performed.	ANAP	MWL
	>(0040,0008)	SQ	Scheduled Protocol	Sequence describing the	ANAP	MWL

			Code Sequence	Scheduled Protocol following a specific coding scheme. This sequence contains one or more Items. Included macro 'Code Sequence Macro', context 'Context ID may be defined in the macro invocation.'		
	>>(0008,0100)	SH	Code Value	See Section 8.1. Required if a sequence item is present.	ALWAYS	MWL
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.2. Required if a sequence item is present.	ALWAYS	MWL
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	MWL
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	MWL
	>(0040,0009)	SH	Scheduled Procedure Step ID	Identifier that identifies the Scheduled Procedure Step.	ANAP	MWL
	>(0040,1001)	SH	Requested Procedure ID	Identifier that identifies the Requested Procedure in the Imaging Service Request.	ANAP	MWL
Information Entity 'Equipment'						
Module 'General Equipment '						
	(0008,0070)	LO	Manufacturer	"Carl Zeiss Meditec AG"	ALWAYS	AUTO
	(0008,0080)	LO	Institution Name	Institution where the equipment that produced the composite instances is located.	ALWAYS	CONFIG
	(0008,0081)	ST	Institution Address	Mailing address of the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
	(0008,1010)	SH	Station Name	User defined name identifying the machine that produced the composite instances.	ANAP	CONFIG
	(0008,1040)	LO	Institutional Department Name	Department in the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
	(0008,1090)	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances. "VISUCAM 224" or	ALWAYS	AUTO

				“VISUCAM 524”		
	(0018,1000)	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)	LO	Software Versions	Manufacturer's designation of software version of the equipment that produced the composite instances. Always “6.0.6.67065” and higher versions "6.0.x.y" where x denotes a patch version and y denotes a build version	ALWAYS	AUTO
Information Entity 'Image'						
Module 'General Image'						
	(0008,0022)	DA	Acquisition Date	The date the acquisition of data that resulted in this image started	ALWAYS	AUTO
	(0008,0023)	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
	(0008,002A)	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
	(0008,0032)	TM	Acquisition Time	The time the acquisition of data that resulted in this image started	ALWAYS	AUTO
	(0020,0013)	IS	Instance Number	A number that identifies this Composite object instance within a series.	ALWAYS	AUTO
	(0020,0020)	CS	Patient Orientation	Patient direction of the rows and columns of the image.	ALWAYS	AUTO

				Required if image does not require Image Orientation (Patient) (0020,0037) and Image Position (Patient) (0020,0032). See C.7.6.1.1.1 for further explanation. Note: IOD's may have attributes other than Patient Orientation, Image Orientation, or Image Position (Patient) to describe orientation in which case this attribute will be zero length. Always “L/F”		
	(0020,4000)	LT	Image Comments	User-defined comments about the image	VNAP	USER
	(0028,0301)	CS	Burned In Annotation	“YES”	ALWAYS	AUTO
	(0028,2112)	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 may also be described in Derivation Description (0008,2111). Required if Lossy Image Compression (0028,2110) has a value of "01".	ANAP	CONFIG AUTO
	(0028,2114)	CS	Lossy Image Compression Method	“ISO_10918_1” or “ISO_10918_1\ ISO_10918_1”* *Multi-valued in case of compression is enabled for DICOM storage.	ANAP	CONFIG AUTO
Module 'Image Pixel '						
	(7FE0,0010)	OW/OB	Pixel Data		ALWAYS	AUTO
Module 'Acquisition Context'						

	(0040,0555)	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
	>(0040,08EA)	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. Included macro 'Code Sequence Macro', context 'Baseline Context ID is 82. '	ANAP	AUTO
	>>(0008,0100)	SH	Code Value	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.3. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>(0040,A043)	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. Included macro 'Code Sequence Macro', context 'No Baseline Context is defined.'	ANAP	AUTO
	>>(0008,0100)	SH	Code Value	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.3. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO

	>(0040,A30A)	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.	ANAP	AUTO
	>(0040,A122)	TM	Time	This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a time. Note The purpose or role of the time value could be specified in Concept Name Code Sequence (0040,A043). Required if the value that Concept Name Code Sequence (0040,A043) requires (implies) is a time. Shall not be present otherwise. Attribute exists for the concepts “FA start time” and “ICG start time”	ANAP	AUTO
	>(0040,A168)	SQ	Concept Code Sequence	This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a Coded Value. Only a single Item shall be included in this sequence. Required if Date (0040,A121), Time (0040,A122), Person Name (0040,A123), Text Value (0040,A160), and the pair of Numeric Value (0040,A30A) and Measurement Units Code Sequence (0040,08EA) are not present. Attribute exits for the concepts “Imaging agent”, “Sensor” and “Protocol name”	ANAP	AUTO

	>>(0008,0100)	SH	Code Value	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.3. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
Module 'VL Image'						
	(0008,0008)	CS	Image Type	Image identification characteristics. Multi-value attribute containing 4 values: 1) Pixel Data Characteristics • "ORIGINAL" for original acquired images • "DERIVED" for any derived image 2) Patient Examination Characteristics • "PRIMARY" or "SECONDARY" 3) Modality Specific Characteristics • "MONTAGE" for panorama images • empty otherwise 4) Implementation specific identifiers(according to selected capture mode) • "COLOR", "REDFREE", "RED", "BLUE", "AF", "FA"[1], "ICG"[1] [1]: only available for VISUCAM 524	ALWAYS	AUTO
	(0008,0033)	TM	Content Time	The time the image pixel data creation started.	ALWAYS	AUTO
	(0008,1140)	SQ	Referenced Image Sequence	A Sequence that references other images significantly related to this image. One or more items may be included in this sequence. Required if Image Type (0008,0008) Value 3 is present and has a value of "STEREO L" or	ANAP	AUTO

				"STEREO R". May also be present otherwise. See Section C.8.12.1.1.7. Included macro 'Image SOP Instance Reference Macro', context ''		
	>(0008,1150)	UI	Referenced SOP Class UID	Uniquely identifies the referenced SOP Class.	ALWAYS	AUTO
	>(0008,1155)	UI	Referenced SOP Instance UID	Uniquely identifies the referenced SOP Instance.	ALWAYS	AUTO
	(0028,0002)	US	Samples per Pixel	“1” for monochrome images. “3” for color images	ALWAYS	AUTO
	(0028,0004)	CS	Photometric Interpretation	“MONOCHROME2” for monochrome images, compressed or not compressed. “RGB” for color images not compressed. “YBR_422_FULL” for color images, compressed.	ALWAYS	AUTO
	(0028,0006)	US	Planar Configuration	“0” for color images. Meaning is color-by-pixel	ANAP	AUTO
	(0028,0100)	US	Bits Allocated	“8”	ALWAYS	AUTO
	(0028,0101)	US	Bits Stored	“8”	ALWAYS	AUTO
	(0028,0102)	US	High Bit	“7”	ALWAYS	AUTO
	(0028,0103)	US	Pixel Representation	“0”	ALWAYS	AUTO
	(0028,2110)	CS	Lossy Image Compression	Specifies whether an Image has undergone lossy compression (at a point in its lifetime). “00” - Image has not been subjected to lossy compression. “01” - Image has been subjected to lossy compression. Always “01”	ALWAYS	AUTO
Module 'SOP Common'						
	(0008,0005)	CS	Specific Character Set	ISO_IR 192 Character Set that expands or replaces the Basic Graphic Set.	ALWAYS	AUTO
	(0008,0016)	UI	SOP Class UID	“1.2.840.1008.5.1.4.1.1.77.1.4”	ALWAYS	AUTO
	(0008,0018)	UI	SOP Instance UID	VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.3.“ followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO

8.1.1.3 Visible Light Photographic Image (Offline Media Storage)

The VISUCAM DICOM Offline Media Storage service provides the possibility of writing and reading DICOM files. It provides an interface to CD-R/RW, other mass storage devices and network connected file systems. The following IOD is created when using the DICOM Offline Media Storage service.

A.32.4 VL Photographic Image Information Object Definition			
Table A.32.4-1 VL PHOTOGRAPHIC IMAGE IOD MODULES			
IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	ALWAYS-
Study	General Study	C.7.2.1	ALWAYS
Series	General Series	C.7.3.1	ALWAYS
Equipment	General Equipment	C.7.5.1	ALWAYS
Image	General Image	C.7.6.1	ALWAYS
	Image Pixel	C.7.6.3	ALWAYS
	Acquisition Context	C.7.6.14	ALWAYS
	VL Image	C.8.12.1	ALWAYS
	SOP Common	C.12.1	ALWAYS

Tag	VR	Name	Value	PoV	Source
File Meta Information					
(0002,0001)	OB	File Meta Information Version	00\01	ALWAYS	AUTO
(0002,0002)	UI	Media Storage SOP Class UID	1.2.840.10008.5.1.4.1.1.77.1.4 (VL Photographic Image Storage)	ALWAYS	AUTO
(0002,0003)	UI	Media Storage SOP Instance UID	The SOP instance UID has a constant prefix of “1.2.276.0.75.2.1.20.0.3” followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO
(0002,0010)	UI	Transfer Syntax UID	1.2.840.10008.1.2 (Implicit VR Little Endian) or 1.2.840.10008.1.2.4.50 (JPEG Baseline) Depending on the configuration. See chapter 4.4.2.4.2 Transfer Syntax Settings	ALWAYS	AUTO
(0002,0012)	UI	Implementation Class UID	1.2.276.0.75.2.1.20.1.4	ALWAYS	AUTO
(0002,0013)	SH	Implementation Version Name	V_4_x	ALWAYS	AUTO
(0002,0016)	AE	Source Application Entity Title	The Source AE-Title depends on the VISUCAM model used and can be have one of the following values: “VISUCAM 224” “VISUCAM 524”	ALWAYS	AUTO

Tag	VR	Name	Value	PoV	Source
Information Entity 'Patient'					
Module 'Patient'					
(0010,0010)	PN	Patient's Name	Patient's full name.	ALWAYS	MWL, USER
(0010,0020)	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL, USER
(0010,0030)	DA	Patient's Birth Date	Birth date of the patient.	ALWAYS	MWL, USER
(0010,0040)	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male, F = female, O = other	VNAP	MWL, USER
(0010,1000)	LO	Other Patient IDs	Other identification numbers or codes used to identify the patient. Note: Only the first value of this multi-valued attribute is copied from MWL	VNAP	MWL
(0010,4000)	LT	Patient Comments	User-defined additional information about the patient.	ANAP	MWL, USER
Information Entity 'Study'					
Module 'General Study'					
(0008,0020)	DA	Study Date	Date the Study started.	ALWAYS	AUTO
(0008,0030)	TM	Study Time	Time the Study started.	ALWAYS	AUTO
(0008,0050)	SH	Accession Number	A RIS generated number that identifies the order for the Study.	VNAP	MWL
(0008,0090)	PN	Referring Physician's Name	Name of the patient's referring physician	VNAP	MWL
(0008,1030)	LO	Study Description	Institution-generated description or classification of the Study (component) performed.	ANAP	USER, MWL
(0020,000D)	UI	Study Instance UID	In the unscheduled case VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.1.“ followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO, MWL
(0020,0010)	SH	Study ID	User or equipment generated Study identifier.	ALWAYS	MWL
Information Entity 'Series'					
Module 'General Series'					

	(0008,0021)	DA	Series Date	Date the Series started.	ALWAYS	AUTO
	(0008,0031)	TM	Series Time	Time the Series started.	ALWAYS	AUTO
	(0008,0060)	CS	Modality	Type of equipment that originally acquired the data used to create the images in this Series. See C.7.3.1.1.1 for Defined Terms. • "XC" for newly captured images • "SC" for modified or imported images	ALWAYS	AUTO
	(0008,1050)	PN	Performing Physicians' Name	Name of the physician(s) administering the Series.	ANAP	AUTO
	(0008,1070)	PN	Operators' Name	Name(s) of the operator(s) supporting the Series.	ANAP	AUTO
	(0018,0015)	CS	Body Part Examined	"HEAD"	ALWAYS	AUTO
	(0020,000E)	UI	Series Instance UID	VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.2." followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO
	(0020,0011)	IS	Series Number	A number that identifies this Series.	ALWAYS	AUTO
	(0020,0060)	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.	ALWAYS	AUTO
Information Entity 'Equipment'						
	Module 'General Equipment '					
	(0008,0070)	LO	Manufacturer	"Carl Zeiss Meditec AG"	ALWAYS	AUTO
	(0008,0080)	LO	Institution Name	Institution where the equipment that produced the composite instances is located.	ANAP	CONFIG

	(0008,0081)	ST	Institution Address	Mailing address of the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
	(0008,1010)	SH	Station Name	User defined name identifying the machine that produced the composite instances.	ANAP	CONFIG
	(0008,1040)	LO	Institutional Department Name	Department in the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
	(0008,1090)	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances. “VISUCAM 224” or “VISUCAM 524”	VNAP	AUTO
	(0018,1000)	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)	LO	Software Versions	Manufacturer's designation of software version of the equipment that produced the composite instances. Always “6.0.6.67065” and higher versions "6.0.x.y" where x denotes a patch version and y denotes a build version	ALWAYS	AUTO
Information Entity 'Image'						
	Module 'General Image'					
	(0008,0022)	DA	Acquisition Date	The date the acquisition of data that resulted in this image started	ALWAYS	AUTO
	(0008,0023)	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	ALWAYS	AUTO

				known as Image Date.		
	(0008,0032)	TM	Acquisition Time	Only in case of Image Type (0008,0008) set to “ICG” or “FAG” this value stores the time elapsed since contrast agent injection.	ALWAYS	AUTO
	(0020,4000)	LT	Image Comments	User-defined comments about the image	VNAP	AUTO
Module 'Image Pixel '						
	(7FE0,0010)	OW/OB	Pixel Data		ALWAYS	AUTO
	(0028,0010)	US	Rows	Number of rows in the image.	ALWAYS	AUTO
	(0028,0011)	US	Columns	Number of columns in the image.	ALWAYS	AUTO
Module 'Acquisition Context'						
	(0040,0555)	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
	>(0040,08EA)	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. Included macro 'Code Sequence Macro', context 'Baseline Context ID is 82. '	ANAP	AUTO
	>>(0008,0100)	SH	Code Value	See Section 8.1. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.2. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>(0040,A043)	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	ANAP	AUTO

				contain exactly one item. Included macro 'Code Sequence Macro', context 'No Baseline Context is defined.'		
	>>(0008,0100)	SH	Code Value	See Section 8.1. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.2. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.2. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>(0040,A30A)	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.	ANAP	AUTO
	>(0040,A168)	SQ	Concept Code Sequence	This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a Coded Value. Only a single Item shall be included in this sequence. Required if Date (0040,A121), Time (0040,A122), Person Name (0040,A123), Text Value (0040,A160), and the pair of Numeric Value (0040,A30A) and Measurement Units Code Sequence (0040,08EA) are not present. Attribute exits for the concepts “Imaging agent”, “Sensor” and “Protocol name”	ANAP	AUTO

	>>(0008,0100)	SH	Code Value	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0102)	SH	Coding Scheme Designator	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
	>>(0008,0103)	SH	Coding Scheme Version	See Section 8.3. Required if a sequence item is present and the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	AUTO
	>>(0008,0104)	LO	Code Meaning	See Section 8.3. Required if a sequence item is present.	ALWAYS	AUTO
Module 'VL Image'						
	(0008,0008)	CS	Image Type	Image identification characteristics. Multi-value attribute containing 4 values: 1) Pixel Data Characteristics • "ORIGINAL" for original acquired images • "DERIVED" for any derived image 2) Patient Examination Characteristics • "PRIMARY" or "SECONDARY" 3) Modality Specific Characteristics • "MONTAGE" for panorama images • empty otherwise 4) Implementation specific identifiers(according to selected capture mode) • "COLOR", "REDFREE", "RED", "BLUE", "AF", "FAG"[1], "ICG"[1] [1]: only available for VISUCAM 524	ALWAYS	AUTO
	(0008,0033)	TM	Content Time	The time the image pixel data creation started.	ALWAYS	AUTO
	(0028,0002)	US	Samples per Pixel	"1" for monochrome images "3" for color images	ALWAYS	AUTO
	(0028,0004)	CS	Photometric Interpretation	"MONOCHROME2" for monochrome images, compressed or not compressed. "RGB" for color images not compressed.	ALWAYS	AUTO

				"YBR_422_FULL" for color images, compressed.		
	(0028,0006)	US	Planar Configuration	"0" for color images. Meaning is color-by-pixel	ANAP	AUTO
	(0028,0030)	DS	Pixel Spacing	Nominal physical distance between the center of each pixel, specified by a numeric pair - adjacent row spacing (delimiter) adjacent column spacing in mm. Note: Only available when Acquisition Context Sequence is encoded with Scheme Version set to „VP4.0" and and Acquisition Context Sequence Items „PixelWidth" and „PixelHeight" are not set.	ANAP	AUTO
	(0028,0100)	US	Bits Allocated	"8"	ALWAYS	AUTO
	(0028,0101)	US	Bits Stored	"8"	ALWAYS	AUTO
	(0028,0102)	US	High Bit	"7"	ALWAYS	AUTO
	(0028,0103)	US	Pixel Representation	"0"	ALWAYS	AUTO
Module 'SOP Common'						
	(0008,0005)	CS	Specific Character Set	ISO_IR 100 Character Set that expands or replaces the Basic Graphic Set.	ALWAYS	AUTO
	(0008,0016)	UI	SOP Class UID	"1.2.840.10008.5.1.4.1.1.77.1.4"	ALWAYS	AUTO
	(0008,0018)	UI	SOP Instance UID	VISUCAM uses a constant prefix of „1.2.276.0.75.2.1.20.0.3." followed by a date/time stamp and a machine specific identifier.	ALWAYS	AUTO
	(0020,0013)	IS	Instance Number	A number that identifies this Composite object instance.	ALWAYS	AUTO

8.1.1.4 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

8.1.2 Attribute Mapping

Modality Worklist	Instance IOD
Study Instance UID	Study Instance UID
Referenced Study Sequence	Referenced Study Sequence
Accession Number	Accession Number
Requested Procedure Description	Study Description
Requested Procedure Description	Request Attributes Sequence > Requested Procedure Description
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
Scheduled Procedure Step Sequence > Scheduled Protocol Code Sequence	Request Attributes Sequence > Scheduled Protocol Code Sequence
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 [1)]
Patient Comments	Patient Comments
Requesting Physician	Physician(s) of Record

[1)] Only the first value of the multi-value field is copied

8.1.3 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 VISUCAM Application.

8.2 Data Dictionary of Private Attributes

The Private Attributes added to created SOP Instances are listed in the table below. VISUCAM reserves blocks of private attributes in group 7711.

Table 8-1 Private Dictionary Group (7711,00xx) = “99CZM”
Occurs in: Ophthalmic Photography Image SOP Instance, Visible Light Photographic Image SOP Instance

Tag	Attribute Name	VR	VM
(7711,00xx)	Private Creator	LO	1
(7711,xx02)	CZM XML Version	LO	1
(7711,xx12)	IOD Version	LO	1

8.3 Coded Terminology and Templates

8.3.1 Private Code Definitions

For exact information in fundus images, a few additional parameters, not defined in the OP-IOD nor VL-IOD, are used. These parameters are stored in a private Acquisition Context Sequence as defined below.
The used Coding Scheme Designator is “99HIKO”, the Coding Scheme Version is "VP4.0".

Hint: Relative angiography times (FA or ICG) have to be computed as difference between FA start time / ICG start time and Acquisition Datetime (0008, 002A)

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
Sensor	Concept Code		Type of sensor
Angle	Numeric Value with Unit	Degrees	Viewing angle in degree
Flash	Numeric Value with Unit	Flash units	Flash level of the funduscamera
Color temp	Numeric Value with Unit	Kelvin	Color temperature of the internal camera
ISO	Numeric Value with Unit	ISO units	ISO value of the internal camera
Contrast	Numeric Value with Unit	none	Contrast value of the internal camera
Saturation	Numeric Value with Unit	none	Saturation value of the internal camera
Focus aid	Numeric Value with Unit	none	Focus aid on or off Value 1 means: Focussing aid was ON
Focus position	Numeric Value with Unit	none	Position value of the focus

Coding Name	Coding Type	Meas. Units Code / Values	Code Meaning / Comments
Eye section	Numeric Value with Unit	none	0: Anterior, 1: Posterior
Fixation Point	Numeric Value with Unit	none	Number of fixation point within a field method
Fixation point X	Numeric Value with Unit	none	X-Coordinate of the fix point
Fixation point Y	Numeric Value with Unit	none	Y-Coordinate of the fix point
Max fix points	Numeric Value with Unit	none	Maximum number of fixation point within a field method
FA start time	Time Code		Acquisition start time of FA series
ICG start time	Time Code		Acquisition start time of ICG series
Imaging agent	Concept Code	"C-B02CC" for capture mode FA "C-B0156" for capture mode ICG	Contrast agent
Protocol name	Concept Code	One of "STANDARD_POS" "CENTER_POS" "OPTIC_DISK" "NO_PROTOCOL" "CZM_2_FIELDS" "CZM_3_FIELDS" "CZM_5_FIELDS" "CZM_7_FIELDS" "ETDRS_7_FIELDS" "JOSLIN_3_FIELDS"	Name of fixation points protocol
Stereo	Concept Code	“True”	Is part of a stereo image pair Note: Only available in Stereo images stored as DICOM file of type Visible Light Photographic Image (1.2.840.10008.5.1.4.1.1.77.1.4)
Stereo laterality	Concept Code	“Right” or “Left”	Left or right image of a stereo pair Note: Only available in Stereo images stored as DICOM file of type Visible Light Photographic Image (1.2.840.10008.5.1.4.1.1.77.1.4)
Stereo exam SOP instance UID	Concept Code	UID	Original SOP instance UID of exporting VISUCAM system Note: Only available in Stereo images stored as DICOM file of type Visible Light Photographic Image (1.2.840.10008.5.1.4.1.1.77.1.4)

Coding Name	Coding Type	Meas. Units Code / Values	Code Meaning / Comments
Stereo offset X	Numeric Value with Unit	Pixel	Relative offset of both stereo images in x-direction Note: Only available in Stereo images stored as DICOM file of type Visible Light Photographic Image (1.2.840.10008.5.1.4.1.1.77.1.4)
Stereo offset Y	Numeric Value with Unit	Pixel	Relative offset of both stereo images in y-direction Note: Only available in Stereo images stored as DICOM file of type Visible Light Photographic Image (1.2.840.10008.5.1.4.1.1.77.1.4)

8.4 Grayscale Image Consistency

Not applicable.

8.5 Standard Extended / Specialized / Private SOP Classes

Specialized or Private SOP Classes are supported.

8.6 Private Transfer Syntaxes

No Private Transfer Syntaxes are supported.

The products meet the essential requirements stipulated in Annex I of the 93/42/EEC Directive governing medical devices. The products are labeled with:

CE 0297

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