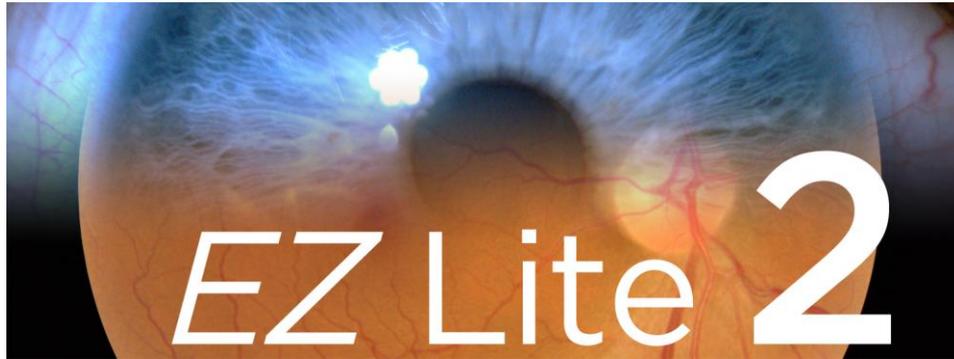# Topcon Medical Systems

EZ Lite 2 Version 1.2

DICOM Conformance Statement

November 1, 2013

Rev 1.1

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Document Version History

DOCUMENT VERSION	DATE	AUTHOR	DESCRIPTION
Rev. 1.0	February 4th, 2013	Sean Royama	Document created.
Rev. 1.1	November 1st, 2013	Sean Royama	Initial Release.

EXECUTIVE OVERVIEW

This document is the DICOM 3.0 Conformance Statement for EZ Lite 2 DICOM Interface to interconnect the Topcon Image acquisition Subsystems to clinical Hospital Information System (HIS) provider. It accommodates reading information from HIS using the DICOM Modality Worklist as a Storage Class User (SCU), storing images to the hospital DICOM server using the DICOM Ophthalmic Photography Image Storage (OP SOP Class) or DICOM Photographic Image Storage (VL SOP class) as a SCU.

Supported DICOM SOP Classes Table 1.1

SOP Class Name (see note)	SOP Class UID	Service Class Role
Verification	1.2.840.10008.1.1	SCU
Modality Worklist Information Model Find	1.2.840.10008.5.1.4.31	SCU
OP Ophthalmic 8-bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	SCU
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	SCU

Table of Contents

1. INTRODUCTION

This document is the DICOM 3.0 Conformance Statement for the EZ Lite 2 DICOM Connection Module. The EZ Lite 2 DICOM Connection Module is an interface component used for retrieving, storing and displaying diagnostic and medical images. The component conforms to the DICOM 3.0 standard to allow the sharing of medical information and images with other Electronic Medical Record (EMR) systems that support DICOM standards.

2. IMPLEMENTATION MODEL

2.1. Application Data Flow Diagram

Figure 1 – The EZ Lite2 DICOM Connection Module – Data Flow Model
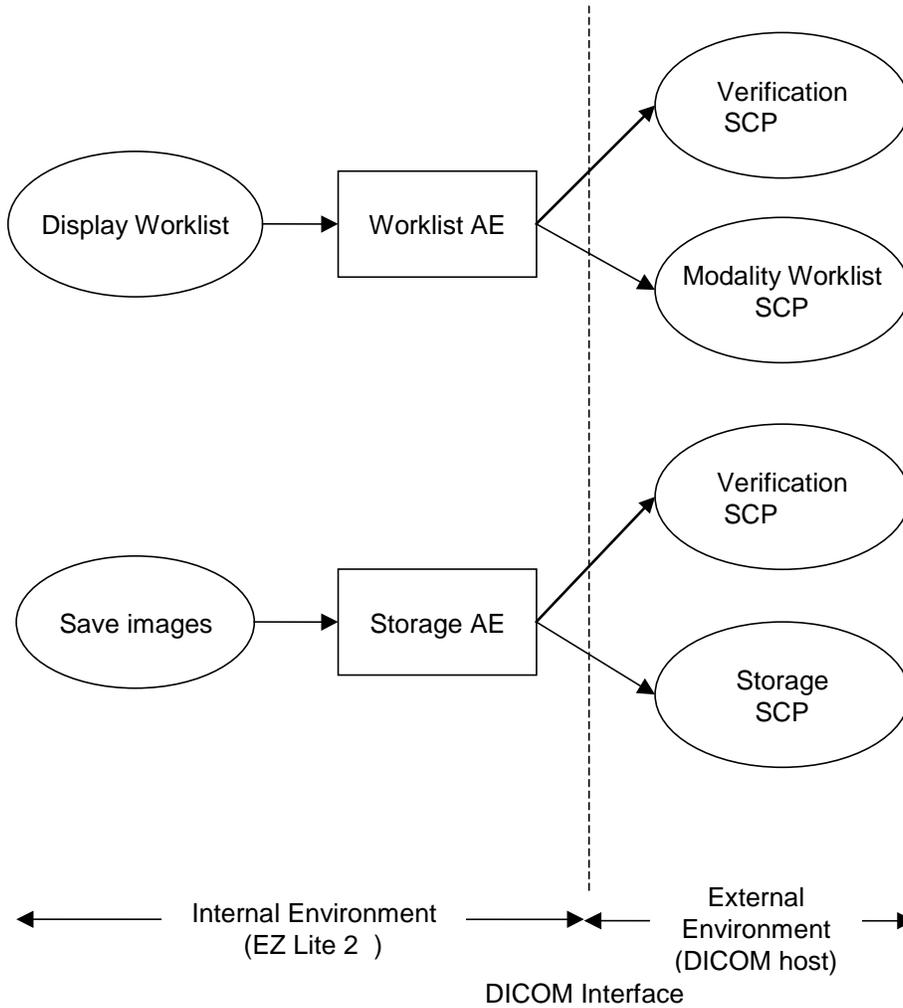
2.2. Functional definitions of AE

- After a user requests to query worklist, the Worklist AE reads the Hospital Worklist information and displays it on EZ Lite 2 screen.

- After a user requests to store images to hospital System the Storage interface AE sends images to the Hospital Remote Storage using the Storage Services.

- The Verification Service is initiated manually by user interface.

2.3. Sequencing of Real World Activities

2.3.1 MWL is available while acquiring images
- Send worklist query to the Hospital EMR system.

- Receive results of worklist and display them on screen.

- A user chooses a worklist and start acquiring images.

- Complete acquisition.

- Store acquired images to remote storage AE by using storage service.

2.3.2 MWL is not available while acquiring images (Unscheduled)
- Enter patient information into the local database.

- Start acquiring images.

- Complete acquisition.

- Store acquired images to local storage.

- Send worklist query to the Hospital EMR system. (When MWL becomes available)

- Receive results of worklist and display them on screen.

- A user selects a pair of a worklist and a locally stored study that matches the selected worklist.

- Store the chosen local study to remote storage AE by using storage service.

3. AE SPECIFICATIONS

3.1. Worklist AE

This AE provides standard conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	Usage
Verification	1.2.840.10008.1.1	SCU
Modality Worklist Information Model Find	1.2.840.10008.5.1.4.31	SCU

3.1.1. Association Establishment Policies

3.1.1.1. General

For the Verification SOP Class, the Worklist AE initiates an Association when acting as a SCU. For the Modality Worklist Information Model Find SOP Class the Worklist AE initiates an Association to the Modality Worklist Provider.

3.1.1.2. Number of Associations

The AE will attempt only one association establishment at a time for each SOP Class.

3.1.1.3. Asynchronous Nature

Asynchronous operation is not supported.

3.1.1.4. Implementation Identifying Information

The Implementation Class UID is "2.16.840.1.114517.10.3.1.1".
The implementation version name is "TOPCON_EZ2_1_1".

3.1.2. Association Initiation Policy

The AE initiates an association for Modality Worklist Information Model Find SOP Class when the user requests the Modality Worklist. There are two (2) real world activities that initiate an association for Verification SOP Class:

- Manual request by the Operator

- Automatic request at system start

3.1.2.1. Real World Activity Verify Availability of Destination

3.1.2.1.1. Associated Real-World Activity

The associated Real-World Activity is the verification of the availability of the destination. The AE use the DIMSE C-ECHO command to verify whether the receiving AE is able to negotiate an Association and respond.

3.1.2.1.2. Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext.
Name	UID	Name List	UID List		Neg.
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.1.2.1. Specific Conformance

The AE provides Standard Conformance to the DICOM Verification Service class.

3.1.2.1.2.2. Association length and duration

The association is released immediately after the response has been received. If the response duration exceeds the specified timeout value, the association will be terminated.

3.1.2.1.2.3. Implementation Specific Behavior

Not applicable.

3.1.2.1.2.4. Transfer Syntax Selection Policies

Not applicable.

3.1.2.1.2.5. Error and Status handling

Process will be terminated if critical error is occurred and description is displayed in information message box and messages are stored in log file. Status of message processing is also displayed.

3.1.2.2. Real World Activity Request Worklist

3.1.2.2.1. Associated Real-World Activity

The associated Real-World Activity is the attempt to display a Worklist on the application window.

3.1.2.2.2. Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext.
Name	UID	Name List	UID List		Neg.
Worklist	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.2.2.1. SOP Specific Conformance

- The AE is able to issue a C-FIND Request to the Basic Modality Worklist SCP using the Accession Number (0008, 0050) as a Matching Key attribute.

- The AE is able to issue a C-FIND Request to the Basic Modality Worklist SCP using the Patient's Name (0010, 0010) as a Matching Key attribute.

- The AE is able to issue a C-FIND Request to the Basic Modality Worklist SCP using the Patient ID (0010, 0020) as a Matching Key attribute.

- The AE is able to issue a C-FIND Request to the Basic Modality Worklist SCP using Scheduled Procedure Step Start Date (0040, 0002) as a Matching Key attribute.

- The AE is able to issue a C-FIND Request to the Basic Modality Worklist SCP using the Requested Procedure ID (0040, 1001) as a Matching Key attribute.

- The Accession Number or Requested Procedure ID is retrieved with Single Value Matching.

- The AE is able to issue a C-FIND Request to the Basic Modality Worklist SCP using the Modality (0008, 0060) as a Matching Key attribute.

- The AE is able to issue a C-FIND Request to the Basic Modality Worklist SCP using the Scheduled Station AE Title (0040, 0001) as a Matching Key attribute.

- The Additional Patient History (0010,21B0) attribute is supported for the patient history summary.

3.1.2.2.2.1.1. Association length and duration

The association is released after all data are transmitted to satisfy the actual request. If the response duration exceeds the specified timeout value, the association will be terminated.

3.1.2.2.2.1.2. Error and Status handling

Process will be terminated if critical error is occurred and description is displayed in information message box as well as is stored in log file.

3.1.2.2.2.1.3 Attributes displayed for MWL

Displayed attribute	Tag	Display Locations
Patient's Name	(0010,0010)	Both
Patient ID	(0010,0020)	Both
Accession Number	(0008,0050)	Both
Patient's Sex	(0010,0040)	Both
Patient's Birth Date	(0010,0030)	Both
Scheduled Procedure Step Description	(0040,0007)	Details
Scheduled Protocol Code Sequence – Code Meaning	(0008,0104)	Details
Scheduled Procedure Step Start Date	(0040,0002)	Both
Requested Procedure ID	(0040,1001)	Both
Requesting Physician	(0032,1032)	Details
Referring Physician's Name	(0008,0090)	Details
Other Patient IDs	(0010,1000)	Details
Ethnic Group	(0010,2160)	Details
Study Instance UID	(0020,000D)	Details
Scheduled Station AE Title	(0004,0001)	Details
Scheduled Procedure Start Time	(0040,0003)	Details
Modality	(0008,0060)	Both
Requested Procedure Description	(0032,1060)	Details
Requested Procedure Code Sequence – Code Meaning	(0008,0104)	Details
Additional Patient History	(0010,21B0)	Details

Display Locations, this column shows where the attribute is displayed on screen as following:

Both: display the attribute on both the browsing list of modality worklist and the MWL Details window.

Details: display the attribute on the MWL Details window only.

3.1.2.2.2.1.4 Transfer Syntax Selection Policies

Not applicable.

3.2. Storage AE

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	Usage
Verification	1.2.840.10008.1.1	SCU
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	SCU
OP Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	SCU

3.2.1. Association Establishment Policies

3.2.1.1. General

For the Verification SOP Class the Worklist AE initiates an Association when acting as a SCU, it accepts an Association when acting as a SCP. For the VL Photographic Image Storage SOP Class the AE acting as a SCU initiates an Association to the Hospital Storage Provider.

3.2.1.2. Number of Associations

The AE will attempt only one association establishment at a time for each SOP Class.

3.2.1.3. Asynchronous Nature

Asynchronous operation is not supported.

3.2.1.4. Implementation Identifying Information

The Implementation Class UID is "2.16.840.1.114517.10.3.1.1".

The implementation version name is "TOPCON_EZ2_1_1".

3.2.2. Association Initiation Policy

The AE initiates an association as a SCU for VL Photographic Image Storage SOP Class or OP Ophthalmic 8-bit Image Storage SOP class when the user requests to send one image or a collection of images.

3.2.2.1. Real World Activity Verify Availability of Destination

3.2.2.1.1. Associated Real-World Activity

The associated Real-World Activity is the verification of the availability of the destination. The AE will attempt to use the DIMSE C-ECHO command to verify whether the receiving AE is able to negotiate an Association and respond. This service is initiated manually by a user.

3.2.2.1.2. Proposed Presentation Contexts

<table>
<tr><td colspan="6" align="center">Presentation Context Table</td></tr>
<tr><td colspan="2" align="center">Abstract Syntax</td><td colspan="2" align="center">Transfer Syntax</td><td align="center">Role</td><td align="center">Ext.</td></tr>
<tr><td align="center">Name</td><td align="center">UID</td><td align="center">Name List</td><td align="center">UID List</td><td></td><td align="center">Neg.</td></tr>
<tr><td>Verification</td><td>1.2.840.10008.1.1</td><td>Implicit VR Little Endian</td><td>1.2.840.10008.1.2</td><td>SCU</td><td>None</td></tr>
</table>

3.2.2.1.2.1. Specific Conformance

The AE provides Standard Conformance to the DICOM Verification Service class.

3.2.2.1.2.2. Association length and duration

The association is released immediately after the response has been received. If the response duration exceeds the specified timeout value, the association will be terminated.

3.2.2.1.2.3. Implementation Specific Behavior

Not applicable.

3.2.2.1.2.4. Presentation Context Acceptance Criterion

The AE will always accept a Presentation Context for the Verification SOP class with the DICOM Default Transfer Syntax.

3.2.2.1.2.5. Transfer Syntax Selection Policies

Not applicable

3.2.2.2. Real World Activity Stores Images

3.2.2.2.1. Associated Real-World Activity

The associated Real-World Activity is the attempt to store images in the Hospital System.

3.2.2.2.2. Proposed Presentation Contexts

<table>
<tr><td colspan="6" align="center">Presentation Context Table</td></tr>
<tr><td colspan="2" align="center">Abstract Syntax</td><td colspan="2" align="center">Transfer Syntax</td><td align="center">Role</td><td align="center">Ext.</td></tr>
<tr><td align="center">Name</td><td align="center">UID</td><td align="center">Name List</td><td align="center">UID List</td><td></td><td align="center">Neg.</td></tr>
<tr><td>VL Photographic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.77.1.4</td><td>Implicit VR Little Endian</td><td>1.2.840.10008.1.2</td><td>SCU</td><td>None</td></tr>
<tr><td>VL Photographic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.77.1.4</td><td>Explicit VR Little Endian</td><td>1.2.840.10008.1.2.1</td><td>SCU</td><td>None</td></tr>
<tr><td>VL Photographic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.77.1.4</td><td>Explicit Big Endian</td><td>1.2.840.10008.1.2.2</td><td>SCU</td><td>None</td></tr>
<tr><td>VL Photographic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.77.1.4</td><td>JPEG lossless, Non-Hierarchical</td><td>1.2.840.10008.1.2.4.57</td><td>SCU</td><td>None</td></tr>
<tr><td>VL Photographic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.77.1.4</td><td>JPEG Lossless, Non-Hierarchical, First-Order Prediction</td><td>1.2.840.10008.1.2.4.70</td><td>SCU</td><td>None</td></tr>
<tr><td>VL Photographic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.77.1.4</td><td>JPEG Baseline Lossy Compression</td><td>1.2.840.10008.1.2.4.50</td><td>SCU</td><td>None</td></tr>
</table>

VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	JPEG 2000 Lossless	1.2.840.10008.1.2.4.90	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	JPEG 2000 Lossy Compression	1.2.840.10008.1.2.4.91	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	Explicit Big Endian	1.2.840.10008.1.2.2	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	JPEG lossless, Non-Hierarchical	1.2.840.10008.1.2.4.57	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	JPEG Baseline Lossy Compression	1.2.840.10008.1.2.4.50	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	JPEG 2000 Lossless	1.2.840.10008.1.2.4.90	SCU	None
Ophthalmic Photography image storage	1.2.840.10008.5.1.4.1.1. 77.1.5.1	JPEG 2000 Lossy Compression	1.2.840.10008.1.2.4.91	SCU	None

3.2.2.2.2.1. Specific Conformance

See Chapter 9.

3.2.2.2.2.1.1. Association length and duration

The association is released after all data are transmitted to satisfy the actual request. If the response duration exceeds the specified timeout value, the association will be terminated.

3.2.2.2.2.1.2. Error and Status handling

Process will be terminated if critical error is occurred and description is displayed in information message box. Status of message processing is also displayed.

3.2.2.2.2.1.3. Presentation Context Acceptance Criterion

The Storage AE will only accept Presentation Contexts specified in the above table.

3.2.2.2.2.1.4. Transfer Syntax Selection Policies

This AE decides the transfer syntax(es) to be included in presentation context using one of methods (determined by configuration parameters) at below.

1) Include the transfer syntax selected in configuration as well as the default transfer syntax.

2) Only include the transfer syntax selected in configuration (without default syntax transfer.)

3) Include all the transfer syntaxes supported by this storage AE.

Default transfer syntax is Implicit Little Endian (1.2.840.10008.1.2).

4. COMMUNICATION PROFILES

4.1. Supported Communication Stacks

The TCP/IP stack is the only supported protocol.

4.1.1. TCP/IP Stack

The AE's inherit the TCP/IP stack from the MS-WINDOWS system upon which they execute.

4.2. Physical Media Support

The AE's are only software components, therefore they are indifferent to the physical medium over which TCP/IP executes. The AE's can use any network adapters that MS-WINDOWS can bind the TCP/IP protocol.

5. EXENTIONS/SPECIALIZATIONS/PRIVATIZATIONS

Not applicable.

6. CONFIGURATION

6.1 Configuration for Remote MWL

The following parameters are configurable for Remote MWL SCP:

- MWL SCP AE Title
- MWL SCP IP address
- MWL SCP IP Port Number
- Time out.

6.2 Configuration for Remote Storage

For each remote storage SCP, the following parameters are configurable:

- Storage SCP AE Title
- Storage SCP IP address
- Storage SCP IP Port Number
- Maximum PDU size (min.: 4Kb, default: 32Kb, max.: 512Kb)
- Timeout values
- Transfer Syntax (Choose from supported transfer syntaxes listed in 3.2.2.2.2 Table.)

6.3 Configuration for Local AE

The following parameters are configurable for the local AE:
- Station Name
- AE Title
- Institution
- Department
- Manufacturer of device
- Model Name of device
- Serial Number of device

6.4. AE Title/Presentation Address Mapping

- The AE titles for SCP and SCU are configurable

- Node IP address, subnet mask, hostname, hostname aliases are configured by the local system administrator

- TCP/IP port is configurable.

7. Security

EZ Lite2 does not support any specific security measures. EZ Lite2 is supposed to be used within a secured environment.

8. SUPPORT OF EXTENDED CHARACTER SETS

No extended character sets are supported.

9. IOD DESCRIPTION:

9.1. Ophthalmic Photography IOD

Attribute Tag	Description	T	Length	A	B	Remarks
(0010,0010)	Patient Name	2	32	X	X	
(0010,0020)	Patient ID	2	64	X	X	
(0010,0030)	Patient's Birth Date	2	-	X	X	
(0010,0040)	Patient's Sex	2	1	X	X	
(0010,1000)	Other Patient ID's	3	64	X		
(0010,2160)	Ethnic Group	3	16	X		
(0010,21B0)	Additional Patient History	nd	10240	X		
(0010,4000)	Patient Comments	3	10240	X		
(0008,1120)	Referenced Patient Sequence	3	-	X		
(0020,000D)	Study Instance UID	1	-	X	X	If MWL missing generated by modality
(0020,0010)	Study ID	2	16	X	X	generated by modality
(0008,0020)	Study Date	2	-	-	-	
(0008,0030)	Study Time	2	-	-	-	
(0008,0050)	Accession Number	2	16	X		
(0008,1030)	Study Description	3	64	X	X	
(0008,0090)	Referring Physician's Name	2	64	X		
(0008,1048)	Physician(s) of Record	3	64	X		
(0008,1070)	Operators' Name	3	32	X		Registered EZ Lite 2 user name.
(0008,1032)	Procedure Code Sequence	R+	-	X		used in case of MWL
(0008,1110)	Referenced Study Sequence	R+	-	X		used in case of MWL
(0020,000E)	Series Instance UID	1	-	-	-	generated by modality
(0020,0011)	Series Number	2	12	-	-	generated by modality
(0008,103E)	Series Description	3	64	-	-	generated by modality
(0008,0060)	Modality	1	-	-	-	Set to "OP"
(0020,0020)	Patient Orientation	3	4	-	-	"L\F"
(0040,0007)	Scheduled Procedure Step Description	3	64	X		used in case of MWL
(0040,0009)	Scheduled Procedure Step ID	1C	16	X		used in case of MWL
(0040,0007)	Requested Procedure ID	1C	16	X		used in case of MWL
(0040,0008)	Scheduled Protocol Code Sequence	R+	-	X		used in case of MWL
(0032,1060)	Requested Procedure Description	R+	64	X		used in case of MWL
(0040,0253)	Performed Procedure Step ID	R+	16	X		used in case of MWL
(0040,0244)	Performed Procedure Step Start Date	R+	-	-	-	
(0040,0245)	Performed Procedure Step Start Time	R+	-	-	-	

(0040,0254)	Performed Procedure Step Description	R+	64	X		used in case of MWL
(0008,0070)	Manufacturer	2	64	-	X	Configured value
(0008,0080)	Institution Name	3	64	-	X	Configured value
(0008,1010)	Station Name	3	16	-	X	Configured value
(0008,1040)	Institutional Department Name	3	64	-	X	Configured value
(0018,1020)	Software Version(s)	3	64	-	X	Read from actual software version.
(0008,1090)	Manufacturer Model Name	3	-	-	X	Configured value
(0008,1000)	Device Serial Number	3	64	-	-	Configured value
(0008,0016)	SOP Class UID	1	-	-	-	
(0008,0018)	SOP Instance UID	1	-	-	-	
(0008,0023)	Content Date	1	-	-	-	
(0008,0033)	Content Time	1	-	-	-	
(0008,0022)	Acquisition Date	3	-	-	-	
(0008,0032)	Acquisition Time	3	-	-	-	
(0008,002A)	Acquisition DateTime	1	-	-	-	
(0008,0008)	Image Type	1	-	-	-	
(0020,0013)	Instance Number	1	12	-	-	generated for each image
(0028,2110)	Lossy Image Compression	1	2	-	-	Defined for JPEG compressed images
(0028, 2112)	Lossy Image Compression Ratio	1C	-	-	-	Defined for JPEG compressed images
(0028, 2114)	Lossy Image Compression Method	1C	-	-	-	Defined for JPEG compressed images
(0028,0002)	Samples per Pixel	1	-	-	-	1 (BW) or 3 (color)
(0028,0004)	Photometric Interpretation	1	-	-	-	MONOCHROME2, YBR_FULL_422 (lossy JPEG) or RGB (lossless JPEG)
(0028,0006)	Planar Configuration	1C	-	-	-	
(0028,0010)	Rows	1	-	-	-	
(0028,0011)	Columns	1	-	-	-	
(0028,0100)	Bits Allocated	1	-	-	-	8
(0028,0101)	Bits Stored	1	-	-	-	8
(0028,0102)	High Bit	1	-	-	-	7
(0028,0103)	Pixel Representation	1	-	-	-	0
(0028,0030)	Pixel Spacing	1C	-	-	-	
(7FE0,0010)	Pixel Data	1	-	-	-	
(0028,0301)	Burned In Annotation	1	-	-	-	Enum("Yes") or Enum("No")
(0020,0062)	Image Laterality	1	1	-	-	
(0008,2218)	Anatomic Region Sequence	1	-	-	-	
(0022,000C)	Horizontal Field of View	2	-	-	-	
(0022,000A)	Emmetropic Magnification	2	-	-	-	Empty
(0022,000D)	Pupil Dilated	2	-	-	-	Empty

(0022,001B)	Refractive State Sequence	2		-	-	-	Empty
(0022,000B)	Intra Ocular Pressure	2	-	-	-		Empty
(0022,0005)	Patient Eye Movement Commanded	2		-	-	-	Empty
(0018,106A)	Synchronization Trigger	1	-	-	-		Enum("NO TRIGGER")
(0018,1800)	Acquisition Time Synchronized	1		-	-	-	Enum("N")
(0020,0200)	Synchronization Frame of Reference UID	1		-	-	-	
(0018,7004)	Detector type	2	-	-	-		CCD
(0022,0015)	Acquisition Device Type Code Sequence	1		-	-	-	
(0022,0016)	Illumination Type Code Sequence	2		-	-	-	Empty
(0022,0018)	Image Path Filter Type Stack Code Sequence	2		-	-	-	Empty
(0022,0019)	Lenses Code Sequence	2		-	-	-	Empty
(0022,0017)	Light Path Filter Type Stack Code Sequence	2		-	-	-	Empty
(0018,1063)	Frame Time	1C	-	-	-		0
(0028,0009)	Frame Increment Pointer	1	-	-	-		Points To Frame Time
(2050,0020)	Presentation LUT Shape	1C		8	-	-	Enum ("IDENTITY") Only for grayscale image.

Legend:

Column 3 (T):   Type of Tag
Column 4 (Length):   Maximum Length of Data in Character
Column 5 (A):   X: value is taken from MWL if present
Column 6 (B):   X: entered by user if MWL is not being used, or generated by modality
- :   not applicable
nd :   not defined
R+   The requirement is IHE extension of the DICOM requirements.

9.2. Visible Light IOD

Attribute Tag	Description	T	Length	A	B	Remarks
(0010,0010)	Patient Name	2	32	X	X	
(0010,0020)	Patient ID	2	64	X	X	
(0010,0030)	Patient's Birth Date	2	-	X	X	
(0010,0040)	Patient's Sex	2	1	X	X	
(0010,1000)	Other Patient ID's	3	64	X		
(0010,2160)	Ethnic Group	3	16	X		
(0010,21B0)	Additional Patient History	nd	10240	X		
(0010,4000)	Patient Comments	3	10240	X		
(0008,1120)	Referenced Patient Sequence	3	-	X		

(0020,000D)	Study Instance UID	1	-	X		If MWL missing generated by modality
(0020,0010)	Study ID	2	16	X	-	generated by modality
(0008,0020)	Study Date	2	-	-	-	
(0008,0030)	Study Time	2	-	-	-	
(0008,0050)	Accession Number	2	16	X		
(0008,1030)	Study Description	3	64	X	X	
(0008,0090)	Referring Physician's Name	2	64	X		
(0008,1048)	Physician(s) of Record	3	64	X		
(0008,1070)	Operators' Name	3	32	X		Registered EZ Lite 2 user name
(0008,1032)	Procedure Code Sequence	R+	-	X		used in case of MWL
(0008,1110)	Referenced Study Sequence	R+	-	X		used in case of MWL
(0020,000E)	Series Instance UID	1	-	-	-	generated by modality
(0020,0011)	Series Number	2	12	-	-	generated by modality
(0008,103E)	Series Description	3	64	-	-	generated by modality
(0008,0060)	Modality	1	-	-	-	set to "XC"
(0020,0020)	Patient Orientation	3	4	-	-	"L\F"
(0020,0060)	Laterality	3	1	-	-	"L" or "R"
(0040,0007)	Scheduled Procedure Step Description	3	64	X		used in case of MWL
(0040,0009)	Scheduled Procedure Step ID	1C	16	X		used in case of MWL
(0040,0007)	Requested Procedure ID	1C	16	X		used in case of MWL
(0040,0008)	Scheduled Protocol Code Sequence	R+	-	X		used in case of MWL
(0032,1060)	Requested Procedure Description	R+	64	X		used in case of MWL
(0040,0253)	Performed Procedure Step ID	R+	16	X		used in case of MWL
(0040,0244)	Performed Procedure Step Start Date	R+	-	-	-	
(0040,0245)	Performed Procedure Step Start Time	R+	-	-	-	
(0040,0254)	Performed Procedure Step Description	R+	64	X		used in case of MWL
(0008,0070)	Manufacturer	2	-	-	-	Configured value
(0008,0080)	Institution Name	3	64	-	-	Configured value
(0008,1010)	Station Name	3	16	-	-	Configured value
(0008,1040)	Institutional Department Name	3	64	-	-	Configured value
(0018,1020)	Software Version(s)	3	64	-	-	Read from actual software version
(0008,1090)	Manufacturer Model Name	3	-	-	-	Configured value
(0008,1000)	Device Serial Number	3	64	-	-	Configured value
(0008,0016)	SOP Class UID	1	-	-	-	
(0008,0018)	SOP Instance UID	1	-	-	-	
(0008,0022)	Acquisition Date	3	-	-	-	
(0008,0032)	Acquisition Time	3	-	-	-	
(0008,0008)	Image Type	1	-	-	-	
(0020,0013)	Instance Number	1	12	-	-	generated for each

						image
(0028,2110)	Lossy Image Compression	1	2	-	-	Defined for JPEG compressed images
(0028, 2112)	Lossy Image Compression Ratio	1	-	-	-	Defined for JPEG compressed images
(0028,0002)	Samples per Pixel	1	-	-	-	1 (BW) or 3 (color)
(0028,0004)	Photometric Interpretation	1	-	-	-	MONOCHROME2, YBR_FULL_422 (lossy JPEG) or RGB (lossless JPEG)
(0028,0006)	Planar Configuration	1C	-	-	-	
(0028,0008)	Number of Frames	nd	-	-	-	Only used for video
(0028,0010)	Rows	1	-	-	-	
(0028,0011)	Columns	1	-	-	-	
(0028,0100)	Bits Allocated	1	-	-	-	8
(0028,0101)	Bits Stored	1	-	-	-	8
(0028,0102)	High Bit	1	-	-	-	7
(0028,0103)	Pixel Representation	1	-	-	-	0
(0040,0555)	Acquisition Context		-	-	-	Empty
(7FE0,0010)	Pixel Data	1	-	-	-	

Legend:

Column 3 (T):	Type of Tag
Column 4 (Length):	Maximum Length of Data in Character
Column 5 (A):	X: value is taken from MWL if present
Column 6 (B):	X: entered by user if MWL is not being used, or generated by modality.
- :	not applicable
nd :	not defined
R+	The requirement is IHE extension of the DICOM requirements.

9.3. Attribute Mapping from Modality Worklist to Image Header

Modality Worklist Attribute		Image Header Attribute	
DICOM Name	Tag	DICOM Name	Tag
Patient Information			
Patient's Name	(0010,0010)	Patient's Name	(0010,0010)
Patient's Birth Date	(0010,0030)	Patient's Birth Date	(0010,0030)
Patient ID	(0010,0020)	Patient ID	(0010,0020)
Patient's Sex	(0010,0040)	Patient Sex	(0010,0040)
Ethnic Group	(0010,2160)	Ethnic Group	(0010,2160)
Other Patient ID's	(0010,1000)	Other Patient ID's	(0010,1000)
Additional Patient History	(0010,21B0)	Additional Patient History	(0010,21B0)
Patient Comments	(0010,4000)	Patient Comments	(0010,4000)
Referenced Patient Sequence	(0008,1120)	Referenced Patient Sequence	(0008,1120)
Visit Information			
Referring Physician's Name	(0008,0090)	Referring Physician's Name	(0008,0090)
Image Service Request			
Accession Number	(0008,0050)	Accession Number	(0008,0050)
Requested Procedure			
Requested Procedure ID	(0040,1001)	Requested Procedure ID	(0040,1001)
Requested Procedure Description	(0032,1060)	Requested Procedure Description	(0032,1060)
Names of Intended Recipients of Results	(0040,1010)	Physician(s) of Record	(0008,1048)
Study Instance UID	(0020,000D)	Study Instance UID	(0020,000D)
Requested Procedure Code Sequence	(0032,1064)	Procedure Code Sequence	(0008,1032)
Referenced Study Sequence	(0008,1110)	Referenced Study Sequence	(0008,1110)
Scheduled Procedure Step			
Modality	(0008,0060)	Modality	(0008,0060)
Scheduled Procedure Step ID	(0040,0009)	Scheduled Procedure Step ID	(0040,0009)
Scheduled Procedure Step description	(0040,0007)	Scheduled Procedure Step description	(0040,0007)
Scheduled Performing Physician's Name	(0040,0006)	Operators' Name	(0008,1070)
Scheduled Protocol Code Sequence	(0040,0008)	Scheduled Protocol Code Sequence	(0040,0008)

10. ABBREVIATIONS

ASCII	American Standard Code for Information Interchange
AE	Application Entity
ANSI	American National Standards Institute
CR	Computed Radiography
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element Composite
DIMSE-N	DICOM Message Service Element Normalized
DOD	Department Of Defense
DX	Digital Radiography
FTP	File Transfer Protocol (part of the TCP/IP protocol suite)
HL7	Health Level 7
HIS/RIS	Hospital Information System/ Radiology Information System
ID	Identifier
IE	Information Entity
IHE	Integrating the Healthcare Enterprise
HIS	Indian Health Services
HIMSS	Healthcare Information and Management Systems Society
IS	Information System
IOD	Information Object Definition
ISO	International Standards Organization
MPPS	Modality Performed Procedure Step
NEMA	National Electrical Manufacturers Association
MR	Magnetic Resonance
OSI	Open Systems Interconnection
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
PN	Person Name
RFC	Request For Comments
RIS	Radiology Information System
RSNA	Radiological Society of North America
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
VA	Department of Veterans Affairs
VL	Visible Light
VR	Value Representation
XA	X-Ray Angiography