

DICOM Conformance Statement

ABSolu Project
Document revision D
Software version 1.0.5



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Conformance Statement overview

This document is structured as suggested in the DICOM Standard (DICOM PS3.2, 2022d - Conformance).

The ABSolu supports the following SOP Classes:

SOP Classes	Service Class User (SCU)	Service Class Provider (SCP)
Modality Worklist Information Model - FIND	Yes	No
Modality Performed Procedure Step SOP Class	Yes	No
Secondary Capture Image Storage	Yes	No
Multi-frame True Color Secondary Capture Image Storage	Yes	No
Encapsulated PDF Storage	Yes	No
DICOM Print	Yes	No

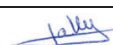
The ABSolu does not support Media interchange.

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1. Introduction

1.1 Revision history

Revision number	Software version	Summary of changes	Author	Date	Signature
A	V1.xx	Creation	J. JALLY	January 30, 2019	-
B	V1.04	Document update for software version 1.04	J. JALLY	September 7, 2020	-
C	V.1.04	(QMDicom.dll V1.0.5.1437 / 11/17/2020)	J. JALLY	January 14, 2021	-
D	V.1.0.5	Document update for software version 1.0.5	J. JALLY	June 19, 2023	

Validated by: C. VENUAT

Date: June 19, 2023

Signature:



1.2 Audience

This document explains how ABSolu will integrate into the healthcare facility. The readers of this document are concerned with overall imaging network policy and architecture. They can also be integrators who need 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. It is assumed that integrators 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.

1.3 Remarks

If another device matches this conformance statement based on the comparison with its own conformance statement, they may be able to interoperate.

DICOM only deals with communication; it does not specify what is needed for certain applications to run on a device.

1.4 Terms and definitions

Abstract Syntax

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

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

Application Entity (AE)

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

Application Entity Title (AET)

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

Application Context

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

Example: DICOM network protocol.

Association

A network communication channel set up between Application Entities.

Attribute

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

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

Information Object Definition (IOD)

The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties.

The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).

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

Joint Photographic Experts Group (JPEG)

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

Media Application Profile

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

Module

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

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

Negotiation

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

Presentation Context

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

Protocol Data Unit (PDU)

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

Security Profile

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

Service Class Provider (SCP)

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

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

Service Class User (SCU)

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

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

Service/Object Pair Class (SOP Class)

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

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

Service/Object Pair Instance (SOP Instance)

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

Examples: a specific x-ray image.

Tag

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

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

Transfer Syntax

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

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

Unique Identifier (UID)

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

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

Value Representation (VR)

The format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR).

When transmitting with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.5 Basics of DICOM communication

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in *italics* below. This section is not a substitute for training about DICOM; it merely seeks to simplify the meanings of DICOM terms.

Two *Application Entities* (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network "handshake". One of the

two devices must initiate an *Association* (a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (*Negotiation*).

DICOM specifies a number of network services and types of information objects, each of which is called an *Abstract Syntax* for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted *Transfer Syntaxes*.

The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association. These combinations are called *Presentation Contexts*. The receiving Application Entity accepts the Presentation Contexts it supports.

For each Presentation Context, the Association Negotiation also allows the devices to agree on *Roles* - which one is the *Service Class User* (SCU - client) and which is the *Service Class Provider* (SCP - server). Normally, the device initiating the connection is the SCU, i.e., the client system calls the server, but this may be not always the case.

The Association Negotiation finally enables exchange of maximum network packet (*PDU*) size, security information, and network service options (called *Extended Negotiation* information).

The Application Entities, having negotiated the Association parameters, may now commence exchanging data. Common data exchanges include:

- Queries for worklists and lists of stored images
- Transfer of image objects and analyses (structured reports)
- Sending images to film printers.

Each exchangeable unit of data is formatted by the sender in accordance with the appropriate *Information Object Definition* and sent using the negotiated Transfer Syntax. There is a Default Transfer Syntax that all systems must accept, but it may not be the most efficient for some use cases.

Each transfer is explicitly acknowledged by the receiver with a *Response Status* indicating success, failure, or that query or retrieve operations are still in process.

Two Application Entities may also communicate with each other by exchanging media (such as a CD-R). Since there is no Association Negotiation possible, they both use a *Media Application Profile* that specifies "pre-negotiated" exchange media format, Abstract Syntax, and Transfer Syntax.

1.6 Abbreviations

Abbreviation	Definition
AE	Application Entity
AET	Application Entity Title
DICOM	Digital Imaging and Communication in Medicine
ILE	Implicit Little Indian
IOD	Information Object Definition
JPG	JPEG Coding Process 1; JPEG Baseline; ISA 10918-1
MPEG2	Motion Picture Expert Group 2; Abbreviation and synonym for video encoding and compression transfer syntax.
MPPS	Modality Performed Procedure Step
MWL	Modality Work List
RLE	Run Length Encoding
PDU	Protocol Data Unit
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair, pair of user and provider.
TCP/IP	Transmission Control Protocol / Internet Protocol
UID	Unique Identifier

1.7 References

NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at <http://medical.nema.org/>.

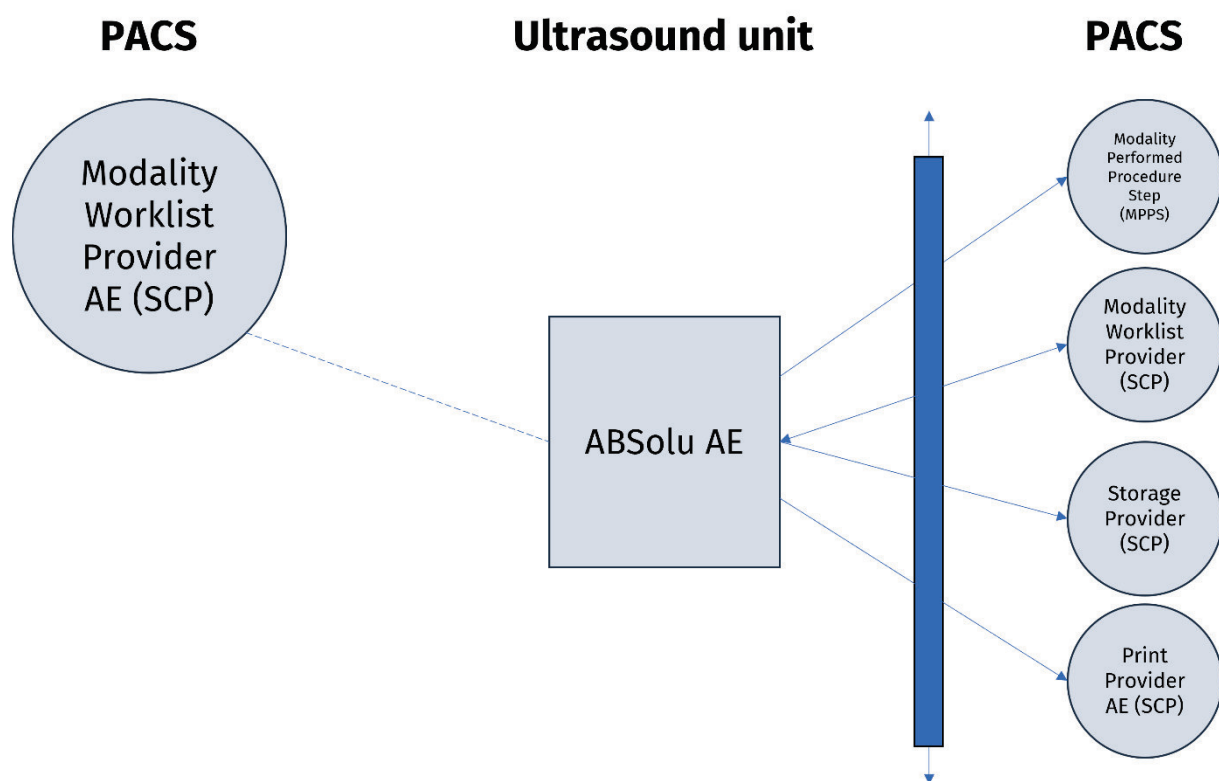
2. Networking

2.1 Implementation model

This section explains application data flow and provides definitions of the application entities. It finally includes a diagram that visualizes the sequencing of real-world activities generated by these entities.

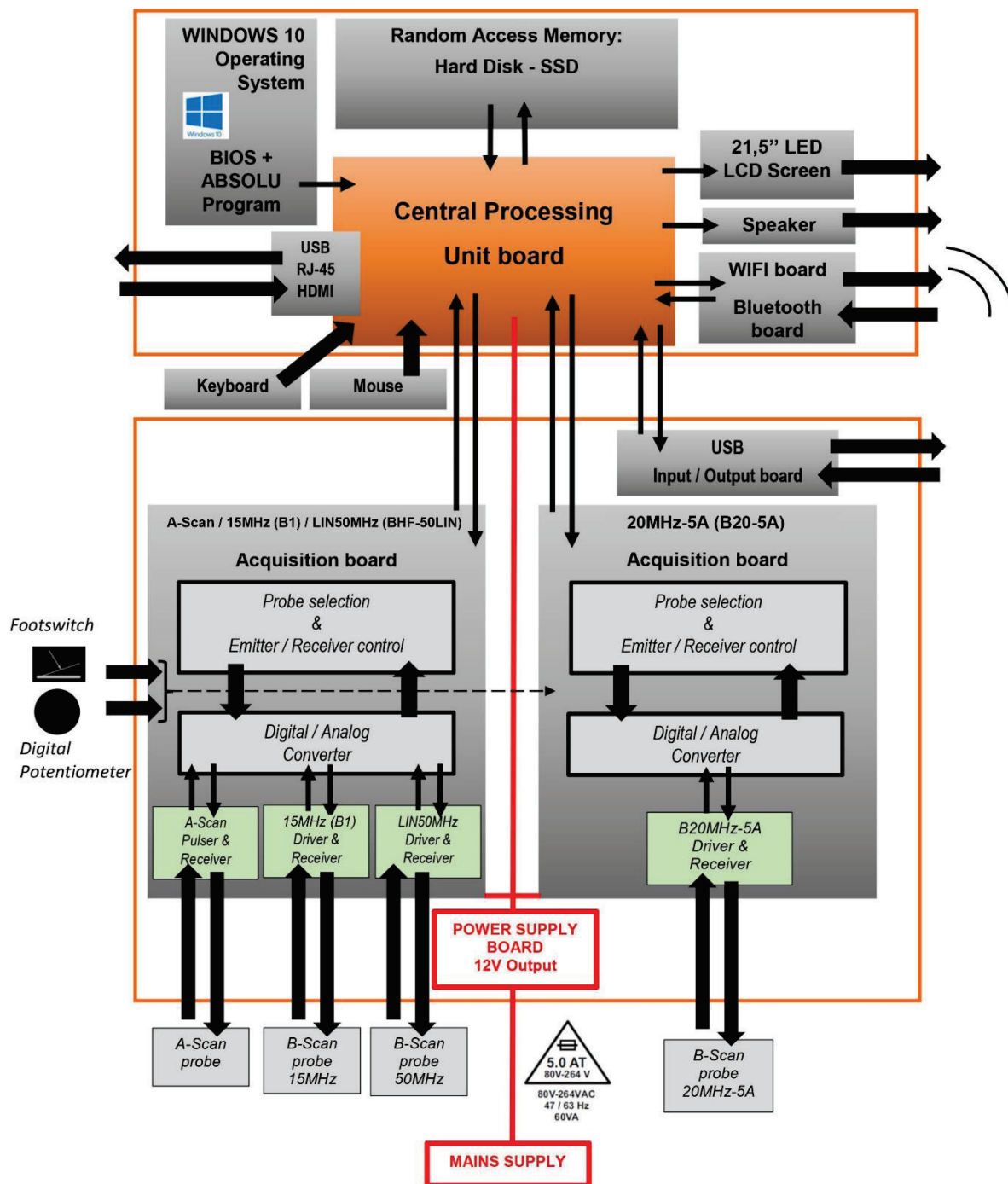
2.1.1 Application data flow

The ABSolu software works together with network components (ABSolu AE) to provide connectivity to a DICOM network.



2.1.2 Functional definition of AEs

2.1.2.1 ABSolu overview



2.1.2.2 Functional definition of Storage Application Entity

The storage is initiated by user action, i.e., clicking the **Save Dicom** or **Save Dicom as PDF** icons.



An association request is sent to the destination AE. Upon successful negotiation of a Presentation Context, the image transfer is started. If the association cannot be opened, the related send-job is set to an error state. It can be restarted by the user by clicking the **Dicom** or **Save Dicom as PDF** icons (see image before).

By default, the Storage AE will not try to initiate another association for this send-job automatically.

2.1.2.3 Functional definition of Workflow Application Entity

Worklist is initiated by user action, i.e., clicking the **Search** icon in the DICOM Worklist screen.



Worklist Update attempts to download a Worklist from a remote node. If the Workflow AE establishes an Association to a remote AE, it will transfer all worklist items via the open Association.

During receiving the worklist response, items are counted. The results will be displayed in a separate list, which will be cleared with the next Worklist Update.

2.1.2.4 Functional definition of Modality Performed Procedure Step Entity

To use the Modality Performed Procedure Step (MPPS), it must set in the DICOM Settings page. If MPPS is enabled, an information is sent to the PACS when the user enters an exam page of a patient from the Worklist results (clicking on **New Session**).



When the user leaves the exam page (clicking on **End Session**), the user must select a termination status (**Completed** or **Discontinued**).



This information will then be sent to the PACS.

2.1.2.5 Functional definition of Hardcopy Application Entity

Print job is initiated by user action, i.e., clicking the **Dicom Print** icon in the Report screen.

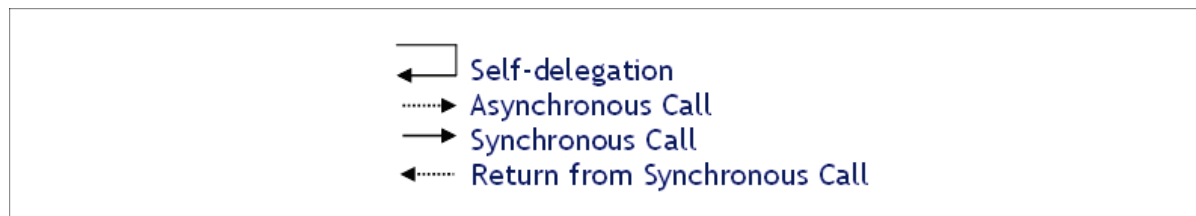


The existence of a print-job in the print queue will activate the Hardcopy AE. An association is established with the printer and the printer's status determined.

If the printer is operating normally, the film sheets described within the print-job will be printed. If the printer is not operating normally, the print-job will set to an error state and can be restarted by the user via the job control interface.

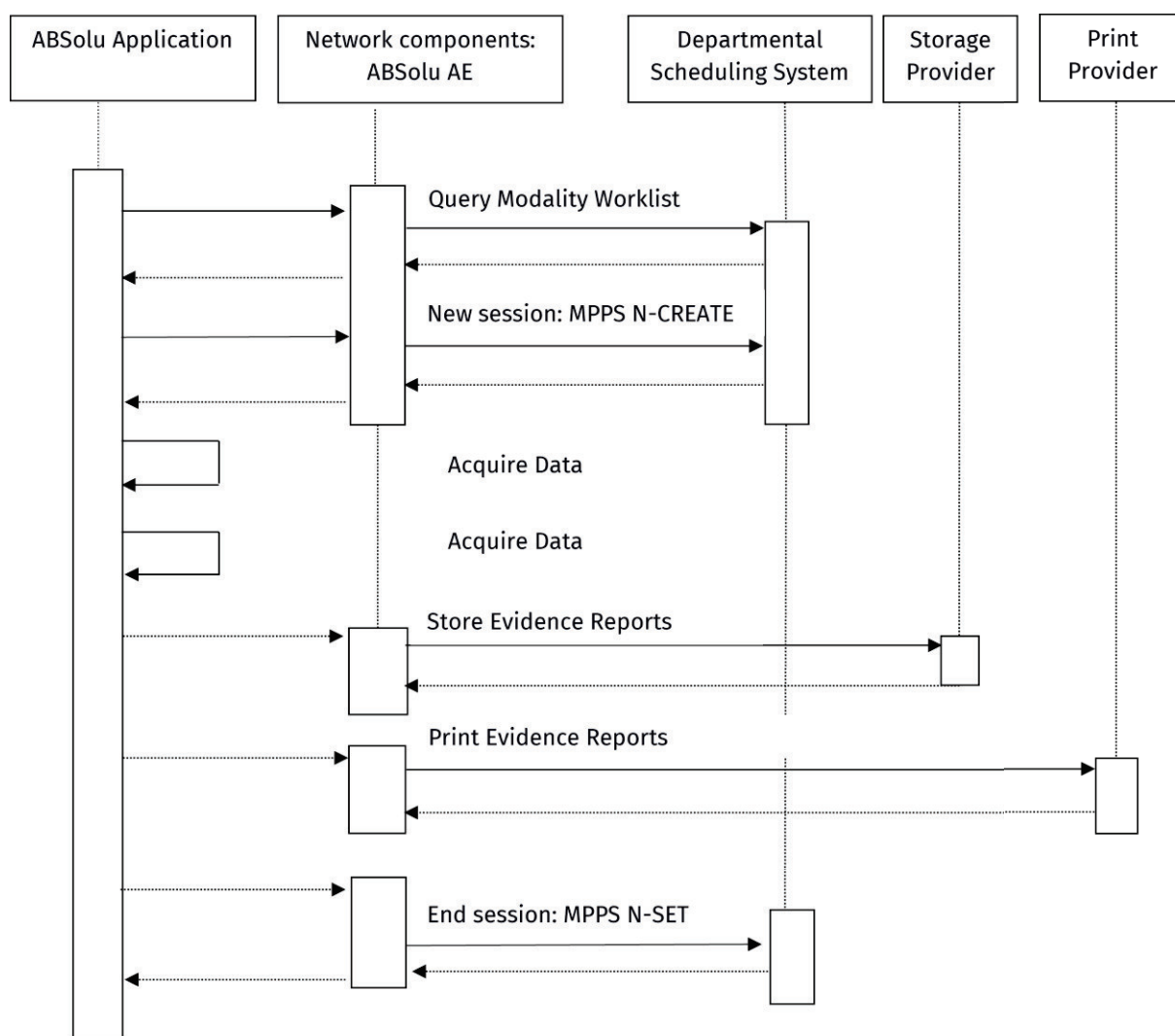
2.1.3 Sequencing of real-world activities

Different entities work together to generate real world activities. The following sequenced diagrams show the intended workflow.



The diagrams use slightly modified UML symbols. The asynchronous call is not showed as suggested in UML.

Some objects do have more than one dashed line to symbolize more than one thread.



All activities are initiated by an operator.

Query Modality Worklist:

ABSolu queries work items related to the user's filters from the current Worklist. According to the transferred data, ABSolu creates entries in the local database (Patient information in the patient file). The Imported patient is automatically selected, and the operator can modify patient data or start data acquisition.

Acquire Data:

The Operator acquires patient's eye data by using the ABSolu. Each image / report can be saved.

New Session MPPS N-Create:

The operator starts a new session of examination and send a N-Create request by clicking on the **New Session** icon.



End Session MPPS N-Set:

The operator ends the session of examination and send a N-Set request by clicking on **Completed** or **Discontinued**.

Store evidence reports:

The operator can trigger this function by clicking on a button.

Print evidence report:

The operator can trigger this function by clicking on a button.

2.2 AE specifications

2.2.1 ABSolu application entity specification

2.2.1.1 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
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	No
Basic Film Session (for printer DICOM)	1.2.840.10008.5.1.1.1	Yes	No

2.2.1.2 Associations policies

2.2.1.2.1 General

DICOM Standard Application Context Name is DICOM 3.0

Application Context Name	1.2.840.10008.3.1.1.1
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2.2.1.2.2 Number of associations

Maximum number of simultaneous associations	1
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2.2.1.2.3 Asynchronous nature

ABSolu does not support multiple outstanding transactions over a single association.

2.2.1.2.4 Implementation identifying information

Implementation Class UID	1.3.6.1.4.1.30071.8
Implementation Version Name	fo-dicom 4.0.8

2.2.1.3 Association initiation policy

2.2.1.3.1 Activity – Verification

2.2.1.3.1.1 Description and sequencing of activities

The verification is initiated by user action, i.e., pressing the buttons Test in the DICOM Settings screen. When the verification is finished, a popup with message about the connection is showed with the result: SCU-OK or an error message with the reason.

2.2.1.3.1.2 Proposed presentation contexts

Presentation context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name list	UID list		
Verification SOP class	1.2.840.10008.1.1	ILE	1.2.840.10008.1.2	SCU	No

2.2.1.3.1.3 SOP specific conformance for verification SOP class

Service status	Further meaning	Error code	Behavior
Success	Matching is Complete	0000	ABSolu finishes the verification and display the result (SCU-OK)
*	*	Any other status code	ABSolu displays an error message.

2.2.1.3.2 Activity – Query Modality Worklist

2.2.1.3.2.1 Description and sequencing of activities

ABSolu supports a filtered MWL query. This query is a general query based on filters defined by the operator. The sequencing flow is shown in the figure: Section “Sequencing of Real-World Activities”.

2.2.1.3.2.2 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

2.2.1.3.2.3 SOP specific conformance for Modality Worklist SOP class

Service status	Further meaning	Error code	Behavior
Success	Matching is Complete	0000	ABSolu finishes to receive Worklist Items
*	*	Any other status code	ABSolu displays an error message and write error in log file.

2.2.1.3.3 Activity – Modality Performed Procedure Step

2.2.1.3.3.1 Description and sequencing of activities

ABSolu supports Modality Performed Procedure Step. When a new session starts, ABSolu sends a message to the MPPS provider to inform the patient is currently examined (State **IN PROGRESS**). When the user quits the exam page (by clicking **End Session**), the ABSolu sends the state of the current order. This could be either **Completed** or **Discontinues**.

2.2.1.3.3.2 Proposed presentation contexts

Presentation context table					
Abstract Syntax			Transfer Syntax		Role
Name	UID		Name list	UID list	Ext. Neg.
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3		ILE	1.2.840.10008.1.2	SCU
					No

2.2.1.3.3.3 SOP specific conformance for Modality Performed Procedure Step

Service status	Further meaning	Error code	Behavior
Success	Success	0000	ABSolu send the state of the order (IN PROGRESS / COMPLETED / DISCONTINUED).
*	*	Any other status code	ABSolu display an error message and write error in log file.

DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The reason is logged and reported to the user with a popup message
Association aborted by the SCP or network layers	The reason is logged and reported to the user with a popup message
Association rejected by the SCP.	The reason is logged and reported to the user with a popup message

Tags	Tag Name	Used in patients query as matching key	Used from Worklist record to Storage	Used from Worklist record to MPPS
(0008,0005)	Specific Character Set	Not Used	Not Used	Not Used
(0008,0020)	Study Date	Used	Used	Not Used
(0008,0030)	Study Time	Used	Used	Not Used
(0008,0050)	Accession Number	Used	Used	Used
(0008,0080)	Institution Name	Not Used	Not Used	Not Used
(0008,0090)	Referring Physician's Name	Not Used	Used	Not Used
(0008,1030)	Study Description	Not Used	Used	Not Used
(0008,1080)	Admitting Diagnoses Description	Not Used	Not Used	Not Used
(0008,1110)	Referenced Study Sequence	Not Used	Not Used	Not Used
(0010,0010)	Patient's Name	Used	Used	Used
(0010,0020)	Patient ID	Used	Used	Used
(0010,0021)	Issuer of Patient ID	Not Used	Used	Not Used
(0010,0030)	Patient's Birth Date	Not Used	Used	Used
(0010,0040)	Patient's Sex	Not Used	Used	Used
(0010,1030)	Patient's Weight	Not Used	Not Used	Not Used
(0010,2000)	Medical Alert	Not Used	Not Used	Not Used
(0010,2110)	Allergies	Not Used	Not Used	Not Used
(0010,21C0)	Pregnancy Status	Not Used	Not Used	Not Used
(0010,4000)	Patient Comments	Not Used	Used	Not Used
(0010,000D)	Study Instance UID	Not Used	Used	Used
(0032,1032)	Requesting Physician	Not Used	Used	Not Used
(0032,1060)	Requested Procedure Description	Not Used	Not Used	Used
(0032,1064)	Requested Procedure Code Sequence	Not Used	Not Used	Not Used
(0038,0010)	Admission ID	Not Used	Used	Not Used
(0038,0050)	Special Needs	Not Used	Not Used	Not Used
(0038,0300)	Current Patient Location	Not Used	Not Used	Not Used
(0038,0500)	Patient State	Not Used	Not Used	Not Used
(0040,0010)	Scheduled Station Name	Not Used	Used	Not Used
(0040,0100)	Scheduled Procedure Step Sequence	Used	Not Used	Used
(0040,0001)	Scheduled Station AE Title	Used	Not Used	Used
(0040,0002)	Scheduled Procedure Step Start Date	Used	Not Used	Used

Tags	Tag Name	Used in patients query as matching key	Used from Worklist record to Storage	Used from Worklist record to MPPS
(0040,0003)	Scheduled Procedure Step Start Time	Used	Not Used	Used
(0008,0060)	Modality	Used	Used	Used
(0040,1001)	Requested Procedure ID	Used	Not Used	Used
(0040,1002)	Reason for the Requested Procedure	Not Used	Not Used	Not Used
(0040,1003)	Requested Procedure Priority	Not Used	Not Used	Not Used

2.2.1.3.4 Activity – Store Evidence reports

2.2.1.3.4.1 Description and sequencing of activities

Refer to section: “Sequencing of Real-world Activities” displaying the sequencing flow diagram.

2.2.1.3.4.2 Proposed presentation contexts

Presentation context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name list	UID list		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE Or Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.4	JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression Or ILE	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2	SCU	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	ILE	1.2.840.10008.1.2	SCU	No

2.2.1.3.4.3 SOP specific conformance for Image Storage SOP class

Service status	Further meaning	Error code	Behavior
Success	Success	0000	The pending job acquires a success status and will be removed from list.
*	*	Any other status code	The job gets an error status.

2.2.1.3.5 Activity – Print Evidence reports

2.2.1.3.5.1 Description and sequencing of activities

Refer to section “Sequencing of Real-world Activities” displaying the sequencing flow diagram.

2.2.1.3.5.2 Proposed presentation contexts

Presentation context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name list	UID list		
Basic Film Session	1.2.840.10008.5.1.1.18	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	No

2.2.1.3.5.3 SOP specific conformance for Basic Film Session SOP class

Service status	Further meaning	Error code	Behavior
Success	Success	0000	The pending job acquires a success status and will be removed from list.
*	*	Any other status code	The job gets an error status.

2.2.1.4 Association acceptance policy

ABSolu does not accept Associations.

2.3 Network interfaces

2.3.1 Physical network interface

The physical network interface is not visible by the application. The application uses the communication stack as offered by the operating system (WIFI or Ethernet).

2.3.2 Additional protocols

No additional protocol is supported.

2.4 Configuration

2.4.1 AE title / Presentation address mapping

The mapping from AE Title to TCP/IP addresses and ports is configurable and established at the time of installation by IT and person in charge of the installation.

2.4.1.1 Local AE title

The IP is administrated by Operating system and networking environment. The calling AET is configurable. The calling AET is the AET of the ABSolu.

2.4.1.2 Remote AE titles

The mapping of external AE Titles to TCP/IP addresses and ports is configurable. The ABSolu allows setting up one AE as Modality Worklist Provider, one as MPPS Provider, one as Storage Provider and one as Print Provider. For all AEs, the host or IP, the port and the Application Entity Title must be known. For each provider, the user can activate or not the provider.

3. Media interchange

Media interchange is not integrated in this document since Media interchange is not supported.

4. Support of character sets

For the worklist, ABSolu sends request with ISO_IR 192 encoding.

ABSolu uses the specific character set specified by the PACS for receptions. If no specific character set is received, ABSolu uses UTF-8 encoding.

For sending exams, ABSolu uses the default encoding ISO_IR 192.

Some others Specific Character Set should work too.

5. Security

The DICOM capabilities of the ABSolu application do not support any specific “security” measures.

It is assumed that the ABSolu application is used within a secured environment. It is assumed that a secured environment includes at least:

- Firewall or router protections to ensure that only approved external hosts have network access to the ABSolu Application.
- Firewall or router protections to ensure that the ABSolu application has network access to only 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)).

6. IOD contents

Abbreviations used for presence of values:

Abbreviation	Value
VNAP	Value Not Always Present (attribute sent zero length if no value is present) – Applicable for Type 2, 2C.
ANAP	Attribute Not Always Present – Applicable for Type 3.
ALWAYS	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:

Abbreviation	Value
USER	Attribute value source is from User input.
AUTO	Attribute value is generated automatically.
MWL, MPPS, etc.	Attribute value is the same as the value received using a DICOM service such as Modality Worklist, Modality Performed Procedure Step, etc.
CONFIG	Attribute value source is a configurable parameter.

6.1 Secondary capture image storage IOD

The rows of not supported modules or tags are grey in the table below.

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	General Series	C.7.3.1	M
	Clinical Trial Series	C.7.3.2	U
Equipment	General Equipment	C.7.5.1	U
	SC Equipment	C.8.6.1	M
Acquisition	General Acquisition	C.7.10.1	M
Image	General Image	C.7.6.1	M
	General Reference	C.12.4	U
	Image Pixel	C.7.6.3	M
	Device	C.7.6.12	U
	Specimen	C.7.6.22	U
	SC Image	C.8.6.2	M
	Overlay Plane	C.9.2	U
	VOI LUT	C.11.2	U
	ICC Profile	C.11.15	U
	SOP Common	C.12.1	M
	Common Instance Reference	C.12.2	U

Tag	VR	Name	Value	Presence of Value	Source
Information Entity 'Patient'					
Module 'Patient'					
(0010,0010)	PN	Patient's Name	Patient's full name	ALWAYS	MWL or USER
(0010,0020)	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL or USER
(0010,0030)	DA	Patient's Birth Date	Birth date of the patient. ("yyyymmdd")	ANAP	MWL or USER
(0010,0040)	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female 0 = other. Empty if unknown.	ALWAYS	MWL or USER

Tag	VR	Name	Value	Presence of Value	Source
(0010,1010)	AS	Patient's Age	Patient's age ("000Y")	ANAP	AUTO
(0010,4000)	LT	Patient Comments	Comments of the patient	ANAP	USER
(0038,0010)	LO	Admission ID	Empty or transferred of the worklist	ALWAYS	MWL
(0010,0021)	LO	Issuer of Patient ID	Empty or transferred of the worklist	ALWAYS	MWL
Information Entity 'Study'					
Module 'General Study'					
(0020,000D)	UI	Study Instance UID	Unique identifier for the Study. "1.2.250.1.166.3." as constant prefix.	ALWAYS	MWL or AUTO
(0008,0020)	DA	Study Date	"yyyymmdd"	ALWAYS	MWL or AUTO
(0008,0030)	TM	Study Time	"HHmmss"	ALWAYS	MWL or AUTO
(0008,0090)	PN	Referring Physician's Name	Name of the patient's referring physician	ALWAYS	MWL or AUTO
(0020,0010)	SH	Study ID	Study ID received from the worklist or automatic	ALWAYS	MWL or AUTO
(0008,0050)	SH	Accession Number	A RIS generated number that identifies the order for the Study.	ANAP	MWL or EMPTY
(0008,1030)	SH	Study Description	Study Description recover by MWL else sended empty.	ANAP	MWL or EMPTY
Information Entity 'Series'					
Module 'General Series'					
(0008,0060)	CS	Modality	US	ALWAYS	AUTO
(0020,000E)	UI	Series Instance UID	Unique identifier for the Series. "1.2.250.1.166.3." as constant prefix.	ALWAYS	AUTO
(0020,0011)	IS	Series Number	Number of Series Number	ALWAYS	AUTO
(0008,0021)	DA	Series Date	"yyyymmdd"	ALWAYS	AUTO
(0008,1050)	PN	Performing Physician's Name	Name of the physician performing the study.	ALWAYS	AUTO
Information Entity 'Equipment'					
Module 'General Equipment'					
(0008,0070)	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances. "Quantel Medical"	ALWAYS	AUTO
(0008,1010)	SH	Station Name	ABSolu + serial number (ex ABSolu 0001)	ALWAYS	AUTO
(0008,1090)	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances."Absolu"	ALWAYS	AUTO
(0018,1020)	LO	Software Versions	Manufacturer's designation of software version of the equipment that produced the composite instances.	ALWAYS	AUTO
Module 'SC Equipment'					
(0008,0064)	CS	Conversion Type	Kind of image conversion	ALWAYS	AUTO
Information Entity 'Image'					
Module 'General Image'					
(0020,0013)	IS	Instance Number	Number of the instance	ALWAYS	AUTO
(0020,0020)	CS	Patient Orientation	Empty because unknown	ALWAYS	AUTO
(0008,0023)	DA	Content Date	Date of DICOM file creation (yyyymmdd)	ALWAYS	AUTO
(0008,0033)	TM	Content Time	Time of DICOM file creation (hhmmss)	ALWAYS	AUTO
(0028,0301)	CS	Burned In Annotation	YES	ANAP	AUTO

Tag	VR	Name	Value	Presence of Value	Source
(0020,0062)	CS	Image Laterality	Laterality of (paired) body part examined. Enumerated Values: R = Right L = Left B=Both	ALWAYS	AUTO
Module 'Image Pixel'					
(7FE0,0010)	OB	Pixel Data	Contains the Image Pixel	ALWAYS	AUTO
(0028,0002)	US	Samples per Pixel	3	ALWAYS	AUTO
(0028,0004)	CS	Photometric Interpretation	RGB	ALWAYS	AUTO
(0028,0010)	US	Rows	Image height	ALWAYS	AUTO
(0028,0011)	US	Columns	Image width	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
(0028,0006)	US	Planar Configuration	0	ALWAYS	AUTO
(0028,0103)	US	Pixel Representation	0	ALWAYS	AUTO
(0008,0008)	CS	Image Type	ORIGINAL\PRIMARY\OPHTHALMIC	ALWAYS	AUTO
Module 'SOP Common'					
(0008,0016)	UI	SOP Class UID	1.2.840.10008.5.1.4.1.1.6.1	ALWAYS	AUTO
(0008,0018)	UI	SOP Instance UID	"1.2.250.1.166.3" as constant prefix for generated UIDs.	ALWAYS	AUTO

6.2 Multi-frame true color secondary capture image storage IOD

The rows of not supported modules or tags are grey in the table below.

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	General Series	C.7.3.1	M
	Clinical Trial Series	C.7.3.2	U
Frame of Reference	Frame of Reference	C.7.4.1	C - Required if Pixel Measures or Plane Position (Patient) or Plane Orientation (Patient) Functional Group Macros Present
	Synchronization	C.7.4.2	U
Equipment	General Equipment	C.7.5.1	U
	SC Equipment	C.8.6.1	M
Image	General Image	C.7.6.1	M
	Image Pixel	C.7.6.3	M
	Cine	C.7.6.5	C - Required if Frame Increment Pointer (0028,0009) is Frame Time (0018,1063) or Frame Time Vector (0018,1065)
	Multi-Frame	C.7.6.6	M
	Frame Pointers	C.7.6.9	U
	Device	C.7.6.12	U
	Multi-frame Functional Groups	C.7.6.16	U
	Multi-frame Dimension	C.7.6.17	U
	Specimen	C.7.6.22	U
	SC Image	C.8.6.2	U
	SC Multi-frame Image	C.8.6.3	M
	SC Multi-frame Vector	C.8.6.4	C - Required if Number of Frames is greater than 1
	ICC Profile	C.11.15	U
	SOP Common	C.12.1	M

IE	Module	Reference	Usage
	Common Instance Reference	C.12.2	U
	Frame Extraction	C.12.3	C - Required if the SOP Instance was created in response to a Frame-Level retrieve request

Tag	VR	Name	Value	Presence of Value	Source
Information Entity ‘Patient’					
Module ‘Patient’					
(0010,0010)	PN	Patient’s Name	Patient’s full name	ALWAYS	MWL or USER
(0010,0020)	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL or USER
(0010,0030)	DA	Patient’s Birth Date	Birth date of the patient. (“yyyymmdd”)	ANAP	MWL or USER
(0010,0040)	CS	Patient’s Sex	Sex of the named patient. Enumerated Values: M = male F = female 0 = other. Empty if unknown.	ALWAYS	MWL or USER
(0010,1010)	AS	Patient’s Age	Patient’s age (“000Y”)	ANAP	MWL or USER
(0010,4000)	LT	Patient Comments	Comments of the patient	ANAP	USER
(0038,0010)	LO	Admission ID	Empty or transferred of the worklist	ALWAYS	MWL or EMPTY
(0010,0021)	LO	Issuer of Patient ID	Empty or transferred of the worklist	ALWAYS	MWL or EMPTY
Information Entity ‘Study’					
Module ‘General Study’					
(0020,000D)	UI	Study Instance UID	Unique identifier for the Study. “1.2.250.1.166.3.” as constant prefix.	ALWAYS	MWL or AUTO
(0008,0020)	DA	Study Date	“yyyymmdd”	ALWAYS	MWL or AUTO
(0008,0030)	TM	Study Time	“HHmmss”	ALWAYS	MWL or AUTO
(0008,0090)	PN	Referring Physician’s Name	Name of the patient’s referring physician	ALWAYS	MWL or AUTO
(0020,0010)	SH	Study ID	Study ID from the worklist or automatic.	ALWAYS	MWL or AUTO
(0008,0050)	SH	Accession Number	A RIS generated number that identifies the order for the Study.	ANAP	MWL or EMPTY
(0008,1030)	SH	Study Description	Study Description recover by MWL else sended empty.	ANAP	MWL or EMPTY
Information Entity ‘Series’					
Module ‘General Series’					
(0008,0060)	CS	Modality	US	ALWAYS	AUTO
(0020,000E)	UI	Series Instance UID	Unique identifier for the Series. “1.2.250.1.166.3.” as constant prefix.	ALWAYS	AUTO
(0020,0011)	IS	Series Number	Number of Series Number	ALWAYS	AUTO
(0008,0021)	DA	Series Date	“yyyymmdd”	ALWAYS	AUTO
(0008,1050)	PN	Performing Physician’s Name	Name of the physician performing the study.	ALWAYS	AUTO
Information Entity ‘Equipment’					
Module ‘General Equipment’					

Tag	VR	Name	Value	Presence of Value	Source
(0008,0070)	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances. “Quantel Medical”	ALWAYS	AUTO
(0008,1010)	SH	Station Name	ABSolu + serial number (ex ABSolu 0001)	ALWAYS	AUTO
(0008,1090)	LO	Manufacturer’s Model Name	Manufacturer's model name of the equipment that produced the composite instances.”ABSolu”	ALWAYS	AUTO
(0018,1020)	LO	Software Versions	Manufacturer's designation of software version of the equipment that produced the composite instances.	ALWAYS	AUTO
Information Entity ‘Image’					
Module ‘General Image’					
(0020,0013)	IS	Instance Number	Number of the instance	ALWAYS	AUTO
(0020,0020)	CS	Patient Orientation	Empty because unknown	ALWAYS	AUTO
(0008,0023)	DA	Content Date	Date of DICOM file creation (yyyyMMdd)	ALWAYS	AUTO
(0008,0033)	TM	Content Time	Time of DICOM file creation (hhmmss)	ALWAYS	AUTO
(0028,0301)	CS	Burned In Annotation	YES	ANAP	AUTO
(0020,0062)	CS	Image Laterality	Laterality of (paired) body part examined. Enumerated Values: R = Right L = Left B=Both	ALWAYS	AUTO
Module ‘Image Pixel’					
(7FE0,0010)	OB	Pixel Data	Contains the Image Pixel	ALWAYS	AUTO
Module ‘Cine’					
(0018,1063)	DS	Frame Time	33.33	ALWAYS	AUTO
(0018,1066)	DS	Frame Delay	0.0	ALWAYS	AUTO
Module ‘Multi-frame’					
(0028,0008)	IS	Number of Frames	Number of frames in Cineloop	ALWAYS	AUTO
(0028,0009)	AT	Frame Increment Pointer	(0018,1063)	ALWAYS	AUTO
Module ‘US Image’					
(0028,0002)	US	Samples per Pixel	3	ALWAYS	AUTO
(0028,0004)	CS	Photometric Interpretation	RGB	ALWAYS	AUTO
(0028,0010)	US	Rows	Image height	ALWAYS	AUTO
(0028,0011)	US	Columns	Image width	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
(0028,0006)	US	Planar Configuration	0	ALWAYS	AUTO
(0028,0103)	US	Pixel Representation	0	ALWAYS	AUTO
(0008,0008)	CS	Image Type	ORIGINAL\PRIMARY\OPHTHALMIC	ALWAYS	AUTO
Module ‘SOP Common’					
(0008,0016)	UI	SOP Class UID	1.2.840.10008.5.1.4.1.1.3.1	ALWAYS	AUTO
(0008,0018)	UI	SOP Instance UID	“1.2.250.1.166.3” as constant prefix for generated UIDs.	ALWAYS	MWL or AUTO

Tag	VR	Name	Value	Presence of Value	Source
(0008,1050)	PN	Performing Physician's Name	Name of the physician performing the study.	ALWAYS	AUTO

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6.3 Encapsulated PDF storage IOD

The rows of not supported modules or tags are grey in the table below.

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	Encapsulated Document Series	C.24.1	M
	Clinical Trial Series	C.7.3.2	U
Equipment	General Equipment	C.7.5.1	M
	SC Equipment	C.8.6.1	M
Encapsulated Document	Encapsulated Document	C.24.2	M
	SOP Common	C.12.1	M

Tag	VR	Name	Value	Presence of Value	Source
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Information Entity 'Patient'

Module 'Patient'

(0010,0010)	PN	Patient's Name	Patient's full name	ALWAYS	MWL or USER
(0010,0020)	LO	Patient ID	Primary hospital identification number or code for the patient.	ALWAYS	MWL or USER
(0010,0030)	DA	Patient's Birth Date	Birth date of the patient. ("yyyymmdd")	ANAP	MWL or USER
(0010,0040)	CS	Patient's Sex	Sex of the named patient. Enumerated Values: M = male F = female 0 = other. Empty if unknown.	ALWAYS	MWL or USER
(0010,1010)	AS	Patient's Age	Patient's age ("000Y")	ANAP	MWL or USER
(0010,4000)	LT	Patient Comments	Comments of the patient	ANAP	USER
(0038,0010)	LO	Admission ID	Empty or transferred of the worklist	ALWAYS	MWL
(0010,0021)	LO	Issuer of Patient ID	Empty or transferred of the worklist	ALWAYS	MWL

Information Entity 'Study'

Module 'General Study'

(0020,000D)	UI	Study Instance UID	Unique identifier for the Study. "1.2.250.1.166.3." as constant prefix (if AUTO)	ALWAYS	MWL or AUTO
(0008,0020)	DA	Study Date	"yyyymmdd"	ALWAYS	MWL or AUTO
(0008,0030)	TM	Study Time	"HHmmss"	ALWAYS	MWL or AUTO
(0008,0090)	PN	Referring Physician's Name	Name of the patient's referring physician	ALWAYS	MWL or AUTO
(0020,0010)	SH	Study ID	Study ID from worklist or automatic	ALWAYS	MWL or AUTO

Tag	VR	Name	Value	Presence of Value	Source
(0008,0050)	SH	Accession Number	A RIS generated number that identifies the order for the Study.	ANAP	MWL or EMPTY
(0008,1030)	SH	Study Description	Study Description recover by MWL else send empty.	ANAP	MWL or EMPTY
Information Entity 'Series'					
Module 'Encapsulated Document Series'					
(0008,0060)	CS	Modality	US	ALWAYS	AUTO
(0020,000E)	UI	Series Instance UID	Unique identifier for the Series. "1.2.250.1.166.3." as constant prefix.	ALWAYS	AUTO
(0020,0011)	IS	Series Number	Number of Series Number	ALWAYS	AUTO
(0008,0021)	DA	Series Date	"yyyyMMdd"	ALWAYS	AUTO
Information Entity 'Equipment'					
Module 'General Equipment'					
(0008,0070)	LO	Manufacturer	Manufacturer of the equipment that produced the composite instances. "Quantel Medical"	ALWAYS	AUTO
(0008,1010)	SH	Station Name	ABSolu + serial number (ex ABSolu 0001)	ALWAYS	AUTO
(0008,1090)	LO	Manufacturer's Model Name	Manufacturer's model name of the equipment that produced the composite instances. "ABSolu"	ALWAYS	AUTO
(0018,1020)	LO	Software Versions	Manufacturer's designation of software version of the equipment that produced the composite instances.	ALWAYS	AUTO
Module 'SC Equipment'					
(0008,0064)	CS	Conversion Type	WSD	ALWAYS	AUTO
Information Entity 'Encapsulated Document'					
Module 'Encapsulated Document'					
(0020,0013)	IS	Instance Number	Number of the instance	ALWAYS	AUTO
(0008,0023)	DA	Content Date	Date of DICOM file creation (yyyyMMdd)	ALWAYS	AUTO
(0008,0033)	TM	Content Time	Time of DICOM file creation (hhmmss)	ALWAYS	AUTO
(0028,0301)	CS	Burned In Annotation	YES	ANAP	AUTO
(0020,0062)	CS	Image Laterality	Laterality of (paired) body part examined. Enumerated Values: R = Right L = Left B=Both	ALWAYS	AUTO
(0042,0010)	ST	Document Title	Name of probes/ exams.	ALWAYS	AUTO
(0040,A043)	SQ	Concept Name Code Sequence	Empty	EMPTY	AUTO
(0042,0012)	LO	MIME Type of Encapsulated Document	application/pdf	ALWAYS	AUTO
(0042,0014)	SH	List of MIME Types	application/pdf\image/jpeg	ALWAYS	AUTO
(0042,0011)	OB	Encapsulated Document	Contains the PDF data	ALWAYS	AUTO
Module 'SOP Common'					
(0008,0016)	UI	SOP Class UID	1.2.840.10008.5.1.4.1.1.104.1	ALWAYS	AUTO
(0008,0018)	UI	SOP Instance UID	"1.2.250.1.166.3" as constant prefix for generated UIDs.	ALWAYS	MWL or AUTO

6.4 Coded terminology and templates

Not applicable.

6.5 Standard extended / specialized private SOP classes

Specialized SOP classes are not supported.

6.6 Private transfer syntaxes

No private Transfer Syntaxes are supported.