

## 2908 Mammo Pro

# DICOM V3.0 Conformance Statement

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## 0 Introduction

This document describes the conformance of the Mammo Pro implementation to the DICOM Standard, based on the DICOM Standard PS 3.2-2003.

### Acronyms and Abbreviations

AE	Application Entity
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
IOD	Information Object Definition
ISO	International Standards Organization
LUT	Lookup Table
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP / IP	Transmission Control Protocol / Internet Protocol
UID	Unique Identifier

Following the DICOM Standard, each reference to the Standard is described, for example, "DICOM Standard V3.0 Part 2" as "PS3.2" in this document.

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## 1 Implementation Model

Mammo Pro implements a function of storing images (Storage SCU) and querying and retrieving study information (Modality Worklist SCU) in the DICOM Standard.

## 1.1 Application Data Flow

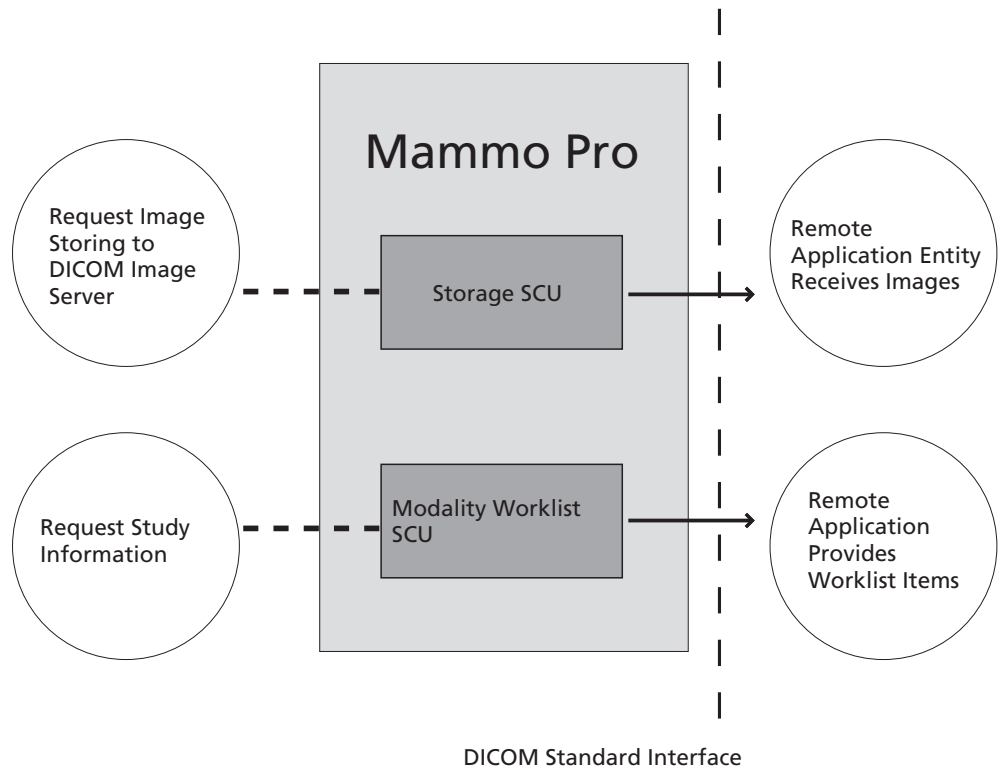


Table 1-1 Mammo Pro Implementation Model

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## 1.2 Functional Definitions of AEs

Mammo Pro operates as Storage SCU and Modality Worklist SCU defined PS3.4.

### Storage SCU

Will send images to Storage SCP following the procedure defined in PS3.7.

### Modality Worklist SCU

Will query and retrieve study information to Modality Worklist Management SCP the following procedure of C-FIND DIMNE-C service defined PS3.7.

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## 1.3 Sequencing of Real-World Activities

Not Applicable.

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# 2 AE Specifications

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## 2.1 Mammo Pro Specifications

Mammo Pro provides Standard Conformance to the following DICOM V3.0.

SOP Class Name	SOP Class UID
<b>Storage Service Class</b>	
Digital Mammography X-Ray Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
<b>Basic Worklist Management Service Class</b>	
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

Table 2-1 Supported SOP Classes as an SCU

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## 2.1.1 Association Establishment Policies

### 2.1.1.1 General

Mammo Pro will negotiate an association with the AE title and the TCP / IP port number.

The maximum PDU size which Mammo Pro is 16KB as the Storage SCU, and 64 KB as the Modality Worklist SCU.

### 2.1.1.2 Number of Associations

Mammo Pro will attempt only one association at a time.

### 2.1.1.3 Asynchronous Nature

Mammo Pro will only allow a single operation on an association. It does not support negotiation of multiple outstanding transactions.

### 2.1.1.4 Implement Identifying Information

Implementation Class UID: "1.2.392.200054.31010000.0.1.0"

Implementation Version name: "2908MP\_1.0"

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## 2.1.2 Association Initiation Policies

In the case of the following real world activities, Mammo Pro will request an initial association to a SCP configured previously.

### Request Image Storing(Storage SCU)

When the user manually stores the scanned images to a Storage SCP.

### Request Study Information (Modality Worklist SCU)

When the user manually searches the study information to a Modality Worklist SCP.

### 2.1.2.1 Storing Images (Storage SCU)

#### 2.1.2.1.1 Associated Real-World Activities

The user sends the scanned images to a Storage SCP configured previously.

#### 2.1.2.1.2 Proposed Presentation Contexts

Table 2-3 specifies the presentation contexts used by Mammo Pro.

Presentation Context Table				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Digital Mammography X-Ray Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian ( 1.2.840.10008.1.2.1 )	SCU	None

Table 2-3 Proposed presentation Contexts (Storage SCU)

#### 2.1.2.1.3 SOP Specific Conformance

Even if Mammo Pro receives a Failed or Warning status of C-STORE message from Storage SCP, it sends next SOP instance without changing any information.

Mammo Pro will not try any extended association.

Table 2-4 specifies the attributes of a secondary capture image transmitted by Mammo Pro.

IOD	Attribute	Tag	Value	
			Standard Version	Worklist Version
Patient	Patient's Name	(0010,0010)	Manual Input or NULL	Worklist Search
	Patient ID	(0010,0020)	Manual Input or NULL	Worklist Search
	Patient Birth Date	(0010,0030)	Manual Input or NULL	Worklist Search
	Patient's Sex	(0010,0040)	Manual Input or NULL	Worklist Search
General Study	Study Instance UID	(0020,000D)	Auto	Worklist Search
	Study Date	(0008,0020)	Manual Input or NULL	Worklist Search
	Study Time	(0008,0030)	Manual Input or NULL	Worklist Search
	Study ID	(0020,0010)	Auto	
	Accession Number	(0008,0050)	Manual Input or NULL	Worklist Search
	Study Description	(0008,1030)	NULL	
	Referring Physician's Name	(0008,0090)	NULL	
General Series	Body Part Examined	(0018,0015)	BREAST	
	Patient Position	(0018,5100)	NULL	
	Series Instance UID	(0020,000E)	Auto	
	Series Number	(0020,0011)	NULL	
DX Series	Presentation Intent Type	(0008,0068)	FOR PRESENTATION	

Table 2-4 the attributes of a secondary capture image transmitted by Mammo Pro (Storage SCU)

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IOD	Attribute	Tag	Value	
			Standard Version	Worklist Version
Mammography series	Modality	(0008,0060)	MG	
General Equipment	Manufacturer	(0008,0070)	Array Corporation	
	Institution Name	(0008,0080)	Manual Input or NULL	
General Image	Instance Number	(0020,0013)	Auto	
	Acquisition Date	(0008,0022)	Auto	
Image Pixel	Sample per pixel	(0028,0002)	1	
	Photometric Interpretation	(0028,0004)	MONOCHROME2	
	Rows	(0028,0010)	Auto	
	Columns	(0028,0011)	Auto	
	Bits allocated	(0028,0100)	16	
	Bits stored	(0028,0101)	12	
DX Image	High bit	(0028,0102)	11	
	Image Type	(0008,0008)	ORIGINAL\PRIMARY\	
	Pixel Representation	(0028,0103)	0	
	Pixel Intensity Relationship	(0028,1040)	LOG	
	Pixel Intensity Relationship Sign	(0028,1041)	-1	
	Window Center	(0028,1050)	Auto	
	Window Width	(0028,1051)	Auto	
	Rescale Intercept	(0028,1052)	0	
	Rescale Slope	(0028,1053)	1	
	Rescale Type	(0028,1054)	US	
	Presentation LUT Shape	(2050,0020)	IDENTITY	
	Lossy Image Compression	(0028,2110)	00	
	Patient Orientation	(0020, 0020)	Depends on the assignment on application	
	Burned In Annotation	(0028,0301)	NO	
DX Detector	Detector Type	(0018,7004)	FILM	
	Imager Pixel Spacing	(0018,1164)	Auto	
	Pixel Spacing	(0028,0030)	If the user configure to include this attribute : Auto	
Mammography Image	Positioner Type	(0018,1508)	NONE	
	Image Laterality	(0020,0062)	R or L Depends on the assignment on application	
	Organ Exposed	(0040,0318)	BREAST	
	Anatomic Region Sequence	(0008,2218)		
	>code value	(0008,0100)	T-04000	
	>Coding Scheme Designator	(0008,0102)	SNM3	
	>Code Meaning	(0008,0104)	Breast	
	View Code Sequence	(0054,0220)	Depends on the assignment on application	
	>code value	(0008,0100)		
	>Coding Scheme Designator	(0008,0102)		
	>Coding Scheme Version	(0008,0103)		
	>Code Meaning	(0008,0104)		
	>View Modifier Code Sequence	(0054,0222)	NULL	
	Acquisition Context SOP Common	Acquistition Context Sequence	(0040,0555)	NULL
SOP Class UID		(0008,0016)	1.2.840.10008.5.1.4.1.1.1.2	
SOP Instance UID		(0008,0018)	Auto	
Device Serial Number		(0018,1000)	Auto	
Software Versions		(0018,1020)	MammoPro1.0	
Manufacturer's Model Name		(0008,1090)	2908	

Table 2-4 the attributes of a secondary capture image transmitted by Mammo Pro

## 2.1.2.2 Querying and Retrieving Study information (Modality Worklist SCU)

### 2.1.2.2.1 Associated Real-World Activities

When editing the values of DICOM attributes of images, the user queries study information to the Modality Worklist SOP Class SCP previously configured. The user uses a search key manually entered. The retrieved study information is set to DICOM attributes.

### 2.1.2.2.2 Proposed Presentation Contexts

Mammo Pro will propose the following presentation contexts.

Presentation Context Table				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian (1.2.840.10008.1.2)	SCU	None

Table 2-5: Proposed Presentation Contexts (Modality Worklist SCU)

### 2.1.2.2.3 SOP Specific Conformance

Mammo Pro queries the following information to the Modality Worklist SOP Class SCP.

Description / Module	Tag	Matching Key Type	Return Key Type
<b>Scheduled Procedure Step</b>			
Scheduled Procedure Step Sequence	(0040,0100)	R	1
> Scheduled Station AE Title *1	(0040,0001)	R	1
> Scheduled Procedure Step Start Date*2	(0040,0002)	R	1
> Scheduled Procedure Step Start Time*2	(0040,0003)	R	1
> Modality	(0008,0060)	R	1
> Scheduled Procedure Step Description*2	(0040,0007)	O	1C
<b>Requested Procedure</b>			
Study Instance UID *2	(0020,000D)	O	1
<b>Imaging Service Request</b>			
Accession Number	(0008,0050)	O	2
Referring Physician's Name	(0008,0090)	O	2
<b>Patient Identification</b>			
Patient's Name	(0010,0010)	R	1
Patient ID	(0010,0020)	R	1
<b>Patient Demographic</b>			
Patients Birth Date	(0010,0030)	O	2
Patient's Sex	(0010,0040)	O	2

\*1 Client AE title of Mammo Pro is always used for the value of Scheduled Station AE Title.  
Client AT title is configurable(for details, refer to the user's guide).

\*2 They are not used for search key. However, Mammo Pro retrieves the return value from the Modality Worklist SCP.

Table 2-6: Information Which Mammo Pro Queries

When the user cancels to query, Mammo Pro sends C-CANCEL-FIND-RQ message.

Mammo Pro closes the association after receiving the last C-FIND-RSP or C-FIND-RSP including query finish status.

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## 3 Communication Profiles

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### 3.1 Supported Communication Stacks

Mammo Pro supports DICOM V 3.0 TCP / IP network communication defined in PS 3.8.

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### 3.2 TCP / IP Stack

Mammo Pro inherits its TCP / IP stack from the Windows operating system upon which it executes. Refer to the user's guide for the supported versions of Windows.

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#### 3.2.1 Physical Media Support

Mammo Pro is indifferent to the physical medium over which TCP / IP executes; it inherits this from the Windows operating system upon which it executes.

Refer to the user's guide for the supported versions of Windows.

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## 4 Extensions / Specializations / Privatizations

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### 4.1 SOPs Extended / Specialized / Privated

Mammo Pro uses type 3 private attributes for Storage Service Class's SOP. Therefore, this SOP is Extended SOP Class (the name and UID is the same) Mammo Pro does not use a private attributes.

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### 4.2 Private Transfer Syntax

Mammo Pro does not use a Private Transfer Syntax.

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## 5 Configuration

Mammo Pro may be configured on the user interface. Refer to the Mammo Pro user's guide for the description of the configuration.

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### 5.1 AE Title and Presentation Address Mapping

Mammo Pro will obtain the presentation address with the "AE title", the "host name".

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### 5.2 Configurable Parameters

The following parameter may be configurable for Mammo Pro.

- AE Title

The following parameters may be configurable for the remote AE.

- AE Title
- Host Name
- TCP / IP Port Number

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## 6 Support for Extended Character Sets

Mammo Pro supports ISO-IR 100.

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## 7 Codes and Controlled Terminology

None.

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## 8 Security Profiles

None.