

***Oncentra<sup>®</sup> US Dicomizer v1.0***

***DICOM Conformance Statement***



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# 1. Introduction

This conformance statement specifies how the Oncentra US Dicomizer application conforms to the DICOM PS 3.x-2009 standard and the IEC Technical Report 61852. This document follows the guidelines for DICOM conformance statements of IEC Technical Report 62266. The application uses the DICOM protocol to receive and transmit objects that are used in the radiation therapy process.

This conformance statement applies to Oncentra US Dicomizer v1.0 and higher.

## 1.1 Scope

Oncentra US Dicomizer is a support tool for Oncentra Brachy 4.1 and higher. The tool converts bitmaps to DICOM UltraSound (US) IODs which can be used for 3D planning in Oncentra Brachy. This tool may *only* be used for Oncentra Brachy.

The tool supports the following functions:

- Import RAW bitmap images (BMP, JPG, TIF)
- Import DICOM US without the Image Plane module
- Editing Z-location
- Editing Pixel Spacing
- Exporting to DICOM US (including Image Plane module)

## 1.2 Intended Audience

This document is intended for:

- Users of Oncentra US Dicomizer and Oncentra Brachy
- System administrators of medical equipment.
- Other vendors offering interfacing via DICOM.

It is assumed, that the reader is familiar with the DICOM standard.

# 2. Related Documents

Reference	Revision	Description
[DICOM2006]	3.x-2006	Digital Imaging and Communications in Medicine
555.00185CIB	00*	Oncentra US Dicomizer Release Notes
777.00089MAN	04*	Oncentra Brachy DICOM Conformance Statement

\* Latest version

### 3. Abbreviations

This section provides definitions of abbreviations used in this document.

Abbreviation	Description
US	Ultrasound
AE	Application Entity, according to DICOM terminology
DICOM	Digital Imaging and Communications in Medicine, a standard on image communications in medical applications
DIMSE	DICOM Message Service Element
ELE	Explicit Little Endian
FSR	File-Set Reader
IE	Information Entity
ILE	Implicit Little Endian
IOD	Information Object Definition, according to DICOM terminology
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
SCU	Service Class User, according to DICOM terminology
SCP	Service Class Provider, according to DICOM terminology
SOP	Service-Object-Pair, a definition of an information object (like an image) and of a service (like storage) that can be performed for the object
TCP/IP	Transmission Control Protocol / Internet Protocol, a widely used computer networking protocol
VR	Value Representation, a data encoding method in DICOM
UID	Unique Identifier used to identify an object by a worldwide unique Identifier, according to DICOM terminology.
C-MOVE	DIMSE for transfer of object instance(s) from a remote AE, whose attributes match a specified set of attributes, to another remote AE, which could be the AE of the requestor.
C-FIND	DIMSE for matching of a set of attributes to the attributes of a set of DICOM object instances on a remote AE.
C-STORE	DIMSE for transfer of a DICOM object instance to a remote AE.

### 4. Networking

There is no network interface available. DICOM input/output is file-based.

### 5. Media Interchange

Media interchange is based on folder input and output. There are no specific requirements.

### 6. Support of Character Sets

The application supports only the standard character set repertoire ISO-IR 100 and no Code Extension techniques are used.

### 7. Security

No special security measures are taken.

## 8. IOD Contents

### 8.1 US Image IOD Module Table

IE	Module	Reference	DICOM Usage	Notes
Patient	Patient	C.7.1.1	M	SCU - Provided SCP - Used
Study	General Study	C.7.2.1	M	SCU - Provided SCP - Used
	Patient Study	C.7.2.2	U	SCU - Provided SCP - Used
Series	General Series	C.7.3.1	M	SCU - Provided SCP - Used
Frame of Reference	Frame of Reference	C.7.4.1	U	SCU - Provided SCP - Used
Equipment	General Equipment	C.7.5.1	M	SCU - Provided SCP - Used
Image	General Image	C.7.6.1	M	SCU - Provided SCP - Used
	Image Pixel	C.7.6.3	M	SCU - Provided SCP - Used
	Image Plane	C.7.6.2	(see note)	SCU - Provided SCP - Used
	US Image	C.8.5.6	M	SCU - Provided SCP - Used
	SOP Common	C.12.1	M	SCU - Provided SCP - Used

**NOTE:**

*This module is not standard in the US IOD. The Image Plane module is added to convey the image position and image orientation for a series of transversal images.*

### 8.2 Patient Module

Attribute Name	Tag	Type	Notes
Patient name	(0010,0010)	2	SCU - Provided SCP - Used
Patient ID	(0010,0020)	2	SCU - Provided SCP - Used
Patient's Birth Date	(0010,0030)	2	SCU - Provided SCP - Used
Patient's Sex	(0010,0040)	2	SCU - Provided SCP - Used
Referenced Patient Sequence	(0008,1120)	3	SCU - Not used SCP - Not used
>Referenced SOP Class UID	(0008,1150)	1C	SCU - Not used SCP - Not used
>Referenced SOP Instance UID	(0008,1155)	1C	SCU - Not used SCP - Not used
Patient's Birth Time	(0010,0032)	3	SCU - Not used SCP - Not used
Other Patient Ids	(0010,1000)	3	SCU - Not used SCP - Not used

Attribute Name	Tag	Type	Notes
Other Patient Names	(0010,1001)	3	SCU - Not used SCP - Not used
Ethnic Group	(0010,2160)	3	SCU - Not used SCP - Not used
Patient Comments	(0010,4000)	3	SCU - Not used SCP - Not used

### 8.3 General Study Module

Attribute Name	Tag	Type	Notes
Study Instance UID	(0020,000D)	1	SCU - Provided SCP - Used
Study Date	(0008,0020)	2	SCU - Provided SCP - Used
Study Time	(0008,0030)	2	SCU - Provided SCP - Used
Referring Physician's Name	(0008,0090)	2	SCU - Provided SCP - Used
Study ID	(0020,0010)	2	SCU - Provided SCP - Used
Accession Number	(0008,0050)	2	SCU - Provided SCP - Used
Study Description	(0008,1030)	3	SCU - Provided SCP - Used
Physician(s) of Record	(0008,1048)	3	SCU - Not used SCP - Not used
Name of Physician(s) Reading Study	(0008,1060)	3	SCU - Not used SCP - Not used
Referenced Study Sequence	(0008,1110)	3	SCU - Not used SCP - Not used
>Referenced SOP Class UID	(0008,1150)	1C	SCU - Not used SCP - Not used
>Referenced SOP Instance UID	(0008,1155)	1C	SCU - Not used SCP - Not used
Procedure Code Sequence	(0008,1032)	3	SCU - Not used SCP - Not used

### 8.4 General Series Module

Attribute Name	Tag	Type	Notes
Modality	(0008,0060)	1	SCU - Provided SCP - Used
Series Instance UID	(0020,000E)	1	SCU - Provided SCP - Used
Series Number	(0020,0011)	2	SCU - Provided SCP - Used
Laterality	(0020,0060)	2C	SCU - Not used SCP - Not used
Series Date	(0008,0021)	3	SCU - Not used SCP - Not used
Series Time	(0008,0031)	3	SCU - Not used SCP - Not used

Attribute Name	Tag	Type	Notes
Performing Physicians' Name	(0008,1050)	3	SCU - Not used SCP - Not used
Protocol Name	(0018,1030)	3	SCU - Not used SCP - Not used
Series Description	(0008,103E)	3	SCU - Not used SCP - Not used
Operators' Name	(0008,1070)	3	SCU - Not used SCP - Not used
Referenced Study Component Sequence	(0008,1111)	3	SCU - Not used SCP - Not used
>Referenced SOP Class UID	(0008,1150)	1C	SCU - Not used SCP - Not used
>Referenced SOP Instance UID	(0008,1155)	1C	SCU - Not used SCP - Not used
Body Part Examined	(0018,0015)	3	SCU - Not used SCP - Not used
Patient Position	(0018,5100)	2C	SCU - Provided SCP - Used
Smallest Pixel Value in Series	(0028,0108)	3	SCU - Provided SCP - Used
Largest Pixel Value in Series	(0028,0109)	3	SCU - Provided SCP - Used
Request Attributes Sequence	(0040,0275)	3	SCU - Not used SCP - Not used
>Requested Procedure ID	(0040,1001)	1C	SCU - Not used SCP - Not used
>Scheduled Procedure Step ID	(0040,0009)	1C	SCU - Not used SCP - Not used
>Scheduled Procedure Step Description	(0040,0007)	3	SCU - Not used SCP - Not used
>Scheduled Action Item Code Sequence	(0040,0008)	3	SCU - Not used SCP - Not used
Performed Procedure Step ID	(0040,0253)	3	SCU - Not used SCP - Not used
Performed Procedure Step Start Date	(0040,0244)	3	SCU - Not used SCP - Not used
Performed Procedure Step Start Time	(0040,0245)	3	SCU - Not used SCP - Not used
Performed Procedure Step Description	(0040,0254)	3	SCU - Not used SCP - Not used
Performed Action Item Sequence	(0040,0260)	3	SCU - Not used SCP - Not used

## 8.5 Frame of Reference Module

Attribute Name	Tag	Type	Notes
Frame of Reference UID	(0020,0052)	1	SCU - Provided SCP - Used
Position Reference Indicator	(0020,1040)	2	SCU - Not used SCP - Not used

### 8.6 General Equipment Module

Attribute Name	Tag	Type	Notes
Manufacturer	(0008,0070)	2	SCU - Provided SCP - Used
Institution Name	(0008,0080)	3	SCU - Not used SCP - Not used
Institution Address	(0008,0081)	3	SCU - Not used SCP - Not used
Station Name	(0008,1010)	3	SCU - Not used SCP - Not used
Institutional Department Name	(0008,1040)	3	SCU - Provided SCP - Used
Manufacturer's Model Name	(0008,1090)	3	SCU - Not used SCP - Not used
Device Serial Number	(0018,1000)	3	SCU - Not used SCP - Not used
Software Versions	(0018,1020)	3	SCU - Not used SCP - Not used
Spatial Resolution	(0018,1050)	3	SCU - Not used SCP - Not used
Date of Last Calibration	(0018,1200)	3	SCU - Not used SCP - Not used
Time of Last Calibration	(0018,1201)	3	SCU - Not used SCP - Not used
Pixel Padding Value	(0028,0120)	3	SCU - Not used SCP - Not used

### 8.7 General Image Module

Attribute Name	Tag	Type	Notes
Instance Number	(0020,0013)	2	SCU - Not used SCP - Not used
Patient Orientation	(0020,0020)	2C	SCU - Not used SCP - Not used
Content Date	(0008,0023)	2C	SCU - Not used SCP - Not used
Content Time	(0008,0033)	2C	SCU - Not used SCP - Not used
Image Type	(0008,0008)	1	SCU - Not used SCP - Not used
Acquisition Number	(0020,0012)	3	SCU - Not used SCP - Not used
Acquisition Date	(0008,0022)	3	SCU - Not used SCP - Not used
Acquisition Time	(0008,0032)	3	SCU - Not used SCP - Not used
Acquisition Datetime	(0008,002A)	3	SCU - Not used SCP - Not used
Referenced Image Sequence	(0008,1140)	3	SCU - Not used SCP - Not used
>Referenced SOP Class UID	(0008,1150)	1C	SCU - Not used SCP - Not used
>Referenced SOP Instance UID	(0008,1155)	1C	SCU - Not used SCP - Not used
>Referenced Frame Number	(0008,1160)	3	SCU - Not used SCP - Not used

Attribute Name	Tag	Type	Notes
Derivation Description	(0008,2111)	3	SCU - Not used SCP - Not used
Source Image Sequence	(0008,2112)	3	SCU - Not used SCP - Not used
>Referenced SOP Class UID	(0008,1150)	1C	SCU - Not used SCP - Not used
>Referenced SOP Instance UID	(0008,1155)	1C	SCU - Not used SCP - Not used
>Referenced Frame Number	(0008,1160)	3	SCU - Not used SCP - Not used
Images in Acquisition	(0020,1002)	3	SCU - Not used SCP - Not used
Image Comments	(0020,4000)	3	SCU - Not used SCP - Not used
Quality Control Image	(0028,0300)	3	SCU - Not used SCP - Not used
Burned In Annotation	(0028,0301)	3	SCU - Not used SCP - Not used
Lossy Image Compression	(0028,2110)	3	SCU - Not used SCP - Not used
Lossy Image Compression Ratio	(0028,2112)	3	SCU - Not used SCP - Not used

## 8.8 Image Plane Module

Attribute Name	Tag	Type	Notes
Pixel Spacing	(0028,0030)	1	SCU - Provided SCP - Used
Image Orientation (Patient)	(0020,0037)	1	SCU - Provided SCP - Used
Image Position (Patient)	(0020,0032)	1	SCU - Provided SCP - Used
Slice Thickness	(0018,0050)	2	SCU - Provided SCP - Used
Slice Location	(0020,1041)	3	SCU - Not used SCP - Not used

## 8.9 Image Pixel Module

Attribute Name	Tag	Type	Notes
Samples per Pixel	(0028,0002)	1	SCU - Provided SCP - Used
Photometric Interpretation	(0028,0004)	1	SCU - Not used SCP - Not used
Rows	(0028,0010)	1	SCU - Provided SCP - Used
Columns	(0028,0011)	1	SCU - Provided SCP - Used
Bits Allocated	(0028,0100)	1	SCU - Provided SCP - Used
Bits Stored	(0028,0101)	1	SCU - Provided SCP - Used

Attribute Name	Tag	Type	Notes
High Bit	(0028,0102)	1	SCU - Provided SCP - Used
Pixel Representation	(0028,0103)	1	SCU - Provided SCP - Used
Pixel Data	(7FE0,0010)	1	SCU - Provided SCP - Used All data will be converted to 8-bit grayscale.
Planar Configuration	(0028,0006)	1C	SCU - Not used SCP - Not used
Pixel Aspect Ratio	(0028,0034)	1C	SCU - Not used SCP - Not used
Smallest Image Pixel Value	(0028,0106)	3	SCU - Not used SCP - Not used
Largest Image Pixel Value	(0028,0107)	3	SCU - Not used SCP - Not used
Red Palette Color Lookup Table Descriptor	(0028,1101)	1C	SCU - Not used SCP - Not used
Green Palette Color Lookup Table Descriptor	(0028,1102)	1C	SCU - Not used SCP - Not used
Blue Palette Color Lookup Table Descriptor	(0028,1103)	1C	SCU - Not used SCP - Not used
Red Palette Color Lookup Table Data	(0028,1201)	1C	SCU - Not used SCP - Not used
Green Palette Color Lookup Table Data	(0028,1202)	1C	SCU - Not used SCP - Not used
Blue Palette Color Lookup Table Data	(0028,1203)	1C	SCU - Not used SCP - Not used

### 8.10 US Image Module

No specific US module attributes are used or provided other than in the attributes present in the Image Pixel Module.

### 8.11 SOP Common Module

Attribute Name	Tag	Type	Notes
SOP Class UID	(0008,0016)	1	SCU - Provided SCP - Used
SOP Instance UID	(0008,0018)	1	SCU - Provided SCP - Used
Specific Character Set	(0008,0005)	1C	SCU - 'ISO_IR 100' SCP - Used
Instance Creation Date	(0008,0012)	3	SCU - Not used SCP - Not used
Instance Creation Time	(0008,0013)	3	SCU - Not used SCP - Not used
Instance Creator UID	(0008,0014)	3	SCU - Not used SCP - Not used