

# DICOM Conformance Statement

Application Annex:

EP navigator 5.2

On Interventional Workspot 1.4



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## 1. Introduction

This DICOM Conformance Statement annex is applicable to EP navigator 5.2 Application. In general the EP navigator 5.2 application is the user environment for viewing and analyzing MR and CT images. EP navigator also stores (creates) 3D-ATG as CT series SOP class, but with Modality type XA.

### 1.1. Revision History

The revision history below provides dates and differences among individual document versions.

**Table 1: Revision History**

Document Version	Date of Issue	Status	Description
00	03-Mar-2016	Authorized	Initial Version for EP Navigator 5.2 on Interventional Workspot R1.4.x where x is 0 or higher
01	17-Nov-2016	Authorized	Editorial changes
02	10-Jan-2017	Authorized	Updated value for Manufacture (0008, 0070) from "Philips Medical Systems" to "Philips".

### 1.2. Terminology

DICOM	Digital Imaging and Communications in Medicine
IOD	Information Object Definition
UID	Unique Identifier
VR	Value Representation

## 2. Data Specifications

### 2.1. Supported IOD's

This section specifies each IOD accepted and / or created by EP navigator 5.2 Application.

**ACCEPTED** The applicable IOD is accepted for storage in the repository of the hosting platform and supported as input data for EP navigator 5.2 Application or viewing and analysis.

**CREATED** The EP navigator 5.2 Application supports generation of derived data by using the applicable IOD and is able to store this data in the repository of the hosting platform.

**Table 2: Supported IOD's**

Name	IOD UID	Support	
		ACCEPTED	CREATED
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	No	Yes

**Note:** EP navigator can also use session data as input, which is stored as SC image. However, it cannot use any other SC image object.

#### 2.1.1. Acceptance Criteria

This section specifies the acceptance criteria applied by EP navigator 5.2 Application to which a dataset should adhere before it can be imported into the application. This can be criteria on the highest level (e.g. data from a certain manufacturer or system model) or certain DICOM attributes mandatory to be present into the dataset holding a specific value. In case one or more Philips private attributes are required, then a list of supported Philips system models will be mentioned.

**Table 3: Accepted system models.**

Manufacturer	Modality	System Model Name(s)
Not applicable	Not applicable	Not applicable

**Table 4: Accepted transfer syntaxes per IOD**

Name	IOD UID	Transfer Syntax	
		Name	UID
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1

**Table 5: Accepted attribute values**

Attribute Name	Attribute Number	Values / Comments
Not applicable	Not applicable	Not applicable

## 2.1.2. Contents of Created IOD's

This section specifies in detail the attribute contents of created data objects. Attributes are grouped together by its corresponding module as specified by DICOM standard. Philips private attributes are excluded for specification.

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

### 2.1.2.1. Secondary Capture Image Storage SOP class

**Table 6: IOD of Created Secondary Capture Image Storage SOP Class Instances**

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	USER DEFINED
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	USER DEFINED
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SOP Common Module	ALWAYS
	SC Image Module	ALWAYS
	Modality LUT Module	USER DEFINED
	VOI LUT Module	USER DEFINED
	Extended DICOM and private attributes	ALWAYS

**Table 7: Patient Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		ALWAYS	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

**Table 8: General Study Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	

Study Time	0008,0030	TM		ALWAYS	AUTO	
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	
Study Description	0008,1030	LO		ANAP	COPY, USER	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Physician(s) of Record	0008,1048	PN		ANAP	AUTO, COPY, USER	
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 9: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	AUTO, COPY	

Table 10: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Description	0008,103E	LO		ANAP	AUTO, USER	
Performing Physician's Name	0008,1050	PN		ANAP	COPY, USER	
Operators' Name	0008,1070	PN		ANAP	AUTO, COPY, USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO, COPY	
Series Number	0020,0011	IS		VNAP	AUTO, COPY	
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO, COPY	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO, COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO, COPY	
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO, USER	

Table 11: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP	FIXED	

Institution Name	0008,0080	LO		ANAP	CONFIG	
Manufacturer's Model Name	0008,1090	LO	EP navigator	ANAP	FIXED	
Software Versions	0018,1020	LO	1.4.x	ANAP	FIXED	where "x" is the detailed application SW version.

Table 12 : SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	XA	ANAP	AUTO	In Case Application Session: XA: In case Stude or Carto export depending on input data CT=>CT,MR=>MR, 3D-ATG => CT
Conversion Type	0008,0064	CS		ALWAYS	AUTO	WSD
Secondary Capture Device Manufacturer	0018,1016	LO		ANAP	AUTO	
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ANAP	AUTO	
Secondary Capture Device Software Version(s)	0018,1019	LO		ANAP	AUTO	

Table 13: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	DERIVED\SECONDARY \3DSEG	ALWAYS	AUTO	For Stude and Carto Export :DERIVED\SECONDARY\ 3DSEG For Application Session: DERIVED\SECONDARY
Acquisition Date	0008,0022	DA		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ANAP	AUTO	
Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Acquisition Number	0020,0012	IS		ANAP	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Image Comments	0020,4000	LT		ANAP	AUTO	

Table 14: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	RGB, MONOCHROME 2	ALWAYS	AUTO	For Stude And Carto Export : RGB, For Application Session: MONOCHROME2
Planar Configuration	0028,0006	US		ANAP	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	



Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	8
Bits Stored	0028,0101	US	8	ALWAYS	AUTO	8
High Bit	0028,0102	US	7	ALWAYS	AUTO	7
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ANAP	AUTO	

Table 9: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ANAP	AUTO	
Time of Secondary Capture	0018,1014	TM		ANAP	AUTO	

Table 10: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS	0	ALWAYS		
Rescale Slope	0028,1053	DS	1	ALWAYS		
Rescale Type	0028,1054	LO	US	ALWAYS		

Table 11: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS	0	ALWAYS		
Window Width	0028,1051	DS	0	ALWAYS		

Table 15: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

Table 16: DICOM and private attributes for Secondary Capture Image Storage SOP Class Instances (Segmentation)

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Imager Pixel Spacing	0018,1164	DS				
Shutter Left Vertical Edge	0018,1602	IS				
Shutter Right Vertical Edge	0018,1604	IS				
Shutter Upper Horizontal Edge	0018,1606	IS				
Shutter Lower Horizontal Edge	0018,1608	IS				
Application Version	0018,9525	LO				

Frame Of Reference UID	0020,0052	UI				
Position Reference Indicator	0020,1040	LO				
Requested Procedure ID	0040,1001	SH				
	0011,00A0	LO	BioPri3D	ANAP	AUTO	For Carto: (0011,00xx) LO [BioPri3D PrivateCreator (0063,00xx) LO [BioPri3D PrivateCreator For Stude export => (0019, 00xx) LO [SPI-P Release PrivateCreator For Application Session: (2003,0026) LO [Philips X-ray Imaging DD 023] PrivateCreator
	0063,0021	LO	BioPri3D	ANAP	AUTO	
	0019,0010	LO	SPI-P Release 1	ANAP	AUTO	.
	2003,0026	LO	Philips X-ray Imaging DD 023	ANAP	AUTO	

### 2.1.2.2. CT Image Storage SOP class

Table 17: IOD of Created CT Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Frame of reference	Frame of reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Plane Module	ALWAYS
	Image Pixel Module	ALWAYS
	SOP Common Module	ALWAYS
	CT Image Module	ALWAYS
	Modality LUT Module	USER DEFINED
	SOP Common Module	ALWAYS
	Extended DICOM and private attributes	ALWAYS

Table 18: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		ALWAYS	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 19: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	

Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	

Table 20: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Description	0008,103E	LO		ANAP	AUTO, USER	
Series Date	0008,0021	DA		ANAP		
Series Time	0008,0031	TM		ANAP		
Modality	0008,0060	CS	XA	ALWAYS		
Performing Physician's Name	0008,1050	PN		ANAP	COPY, USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO, COPY	
Series Number	0020,0011	IS		VNAP	AUTO, COPY	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO, COPY	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO, COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO, COPY	

Table 21: Frame Of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS		
Position Reference Indicator	0020,1040	LO		VNAP		

Table 22: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP	FIXED	
Institution Name	0008,0080	LO		ANAP	CONFIG	
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ANAP	FIXED	
Software Versions	0018,1020	LO	1.4.x	ANAP	FIXED	where "x" is the detailed application SW version.

Table 23: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	ORIGINAL\PRIMARY\AXIAL	ANAP	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		EMPTY	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 24: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		VNAP		
Image Position (Patient)	0020,0032	DS		ALWAYS		
Image Orientation (Patient)	0020,0037	DS		ALWAYS		
Slice Location	0020,1041	DS		ANAP		
Pixel Spacing	0028,0030	DS		ALWAYS		

Table 25: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS		
Rows	0028,0010	US		ALWAYS		
Columns	0028,0011	US		ALWAYS		
Bits Allocated	0028,0100	US	16	ALWAYS		
Bits Stored	0028,0101	US	12	ALWAYS		
High Bit	0028,0102	US	11	ALWAYS		
Pixel Representation	0028,0103	US		ALWAYS		
Pixel Data	7FE0,0010	OW				

Table 26: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	ORIGINAL\PRIMARYAXIAL	ALWAYS		
Rescale Intercept	0028,1052	DS		ALWAYS		
Rescale Slope	0028,1053	DS		ALWAYS		
KVP	0018,0060	DS		VNAP		
Acquisition Number	0020,0012	IS		VNAP		
Rescale Type	0028,1054	LO	US	ALWAYS		

Table 12: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS	0	ALWAYS		
Rescale Slope	0028,1053	DS	1	ALWAYS		
Rescale Type	0028,1054	LO	US	ALWAYS		

Table 28 :SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.2	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

Table 29: Extended DICOM and private attributes for CT Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS	WSD	ANAP		

Application Version	0018,9525	LO		ANAP		
Requested Procedure ID	0040,1001	SH		ANAP		
Isocenter Position	300A,012C	DS		ANAP		