

# DICOM Conformance Statement

Application Annex:  
EP navigator R5.6 on Interventional Workspot R1.8



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## 1. DICOM Conformance Statement Overview

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

## 2. Contents

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### 3. Introduction

This DICOM Conformance Statement annex is applicable to EP navigator R5.6 Application. In general, the EP navigator R5.6 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.

#### 3.1. Revision History

The revision history provides dates and differences of the different releases.

Table 1: Revision History

Document Version	Date of Issue	Description of change
01	10-Feb-2023	First Release for EP navigator R5.6 on Interventional Workspot R1.8

#### 3.2. Audience

This Conformance Statement is intended for:

- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

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

#### 3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.

This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**

Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.

It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**

Philips equipment has been carefully tested to ensure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.

Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**

The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to

make changes to its products or to discontinue its delivery. The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

**3.4. Definitions, Terms and Abbreviations**

**Table 2: Definitions, Terms and Abbreviations**

Abbreviation/Term	Explanation
DICOM	Digital Imaging and Communications in Medicine
IOD	Information Object Definition
IW	Interventional Workspot
NEMA	National Electrical Manufacturers Association
UID	Unique Identifier
VR	Value Representation
XA	X-Ray Angiography

**3.5. References**

[DICOM] Digital Imaging and Communications in Medicine, Parts 1 - 22 (NEMA PS 3.1- PS 3.22),  
 National Electrical Manufacturers Association  
 1300 North 17th Street  
 Suite 900  
 Arlington, Virginia 22209  
 Internet: <https://www.dicomstandard.org/current>

## **4. Networking**

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

## **5. Media Interchange**

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

## **6. Support of Character Set**

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

## **7. Security**

For information about this section, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.

## 8. Annexes of "EP navigator R5.6 Application"

### 8.1. IOD Contents

This section specifies each IOD accepted and / or created by EP navigator R5.6 application.

- ACCEPTED The applicable IOD is accepted for storage in the repository of the hosting platform and supported as input data for EP navigator R5.6 Application or viewing and analysis.
- CREATED The EP navigator R5.6 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 3: List of Created SOP Classes**

IOD		Supported	
Name	UID	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	Yes	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.

#### 8.1.1. Acceptance Criteria

This section specifies the acceptance criteria applied by EP Navigator 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 4: Accepted System Models**

Manufacturer	Modality	System Model Name(s)
Philips	MR	Intera 1.5T and 3T,
		Achieva 1.5T and 3T
		Ingenia 1.5T and 3T (SW release 2.5.3 onwards)
	CT	Brilliance 10, 16, 40, 64, 256 slice systems
Philips	XA	Allura
		Azurion
Siemens	MR	Avanto 1.5T
	CT	Definition Sensation 16, 64 (32 channels)
General Electric	CT	Lightspeed 16, 16Pro, VCT Select (32), VCT (64)
Toshiba	CT	Aquilion One

**Table 5: Accepted Transfer Syntaxes per IOD**

For information about this Table, Refer to HSDP-1068450 DICOM Conformance Statement Interventional Workspot R1.8.



**Table 6: Accepted Attribute Values**

Attribute Name	Attribute Number	Values/Comments
Not Applicable	Not Applicable	Not Applicable

**8.1.2. Created SOP Instance**

This section specifies each IOD created by this application.

This section specifies each IOD created. It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

- ALWAYS The module is always present
- CONDITIONAL The module is used under specified condition

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

**8.1.2.1. List of Created SOP Classes**

**Table 7: List of Created SOP Classes**

Name	UID
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

**8.1.2.1.1 CT Image Storage SOP Class**

**Table 8: 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

Information Entity	Module	Presence Of Module
Equipment	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	CONDITIONAL (If the module is present in the source data)
Image	General Image Module	ALWAYS
	Image Plane Module	ALWAYS
	Image Pixel Module	ALWAYS
	CT Image Module	ALWAYS
	SOP Common Module	ALWAYS

**Table 9: Patient Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	

**Table 10: General Study Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Study Date	0008,0020	DA		ALWAYS	COPY	
Study Time	0008,0030	TM		ALWAYS	COPY	
Accession Number	0008,0050	SH		VNAP	COPY	
Referring Physician's Name	0008,0090	PN		VNAP	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study ID	0020,0010	SH		VNAP	COPY	

**Table 11: General Series Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS	XA	ALWAYS	FIXED	
Series Description	0008,103E	LO		ANAP	COPY,	
Performing Physician's Name	0008,1050	PN		ANAP	COPY	
Related Series Sequence	0008,1250	SQ		VNAP	AUTO	
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	

Table 12: Frame Of Reference Module

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

Table 13: General Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	CONFIG	Configured Hospital name
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	FIXED	
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	Mac address of Hospital NIC
Software Versions	0018,1020	LO	1.8.x.y	ALWAYS	AUTO	Where "x.y" are the detailed application SW version

Table 14: General Acquisition Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Acquisition Number	0020,0012	IS		ANAP	COPY	

Table 15: General Image Module

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

Table 16: Image Plane Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Slice Thickness	0018,0050	DS		VNAP	COPY	
Image Position (Patient)	0020,0032	DS		ALWAYS	COPY	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Image Orientation (Patient)	0020,0037	DS		ALWAYS	COPY	
Slice Location	0020,1041	DS		ANAP	COPY	
Pixel Spacing	0028,0030	DS		ALWAYS	COPY	

Table 17: Image Pixel Module

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

Table 18: CT Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Image Type	0008,0008	CS	ORIGINAL\PRIMARY\AXIAL	ALWAYS	COPY	
KVP	0018,0060	DS		VNAP	COPY	
Acquisition Number	0020,0012	IS		VNAP	COPY	
Samples per pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Rescale Type	0028,1054	LO	US	ALWAYS	AUTO	
Isocenter Position	300A,012C	DS		ANAP	AUTO	

Table 19: SOP Common Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Specific Character Set	0008,0005	CS		ANAP	AUTO	As supported by hosting platform
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	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		ALWAYS	AUTO	

8.1.2.1.2 Secondary Capture Image Storage SOP Class

Table 20: 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	CONDITIONAL (If the module is present in the source data)
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	General Reference Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	Modality LUT Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 21: Patient Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	

Table 22: General Study Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Study Date	0008,0020	DA		ALWAYS	COPY	
Study Time	0008,0030	TM		ALWAYS	COPY	
Accession Number	0008,0050	SH		VNAP	COPY	
Referring Physician's Name	0008,0090	PN		VNAP	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study ID	0020,0010	SH		VNAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	COPY	
>Code Value	0008,0100	SH		ALWAYS	COPY	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	
>Code Meaning	0008,0104	LO		ALWAYS	COPY	
Physician(s) of Record	0008,1048	PN		ANAP	COPY	

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	COPY	
Requesting Service	0032,1033	LO		ANAP	COPY	

**Table 23: Patient Study Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Patient's Weight	0010,1030	DS		ANAP	COPY	
Patient's Age	0010,1010	AS		ANAP	COPY	
Pregnancy Status	0010,21C0	US		ANAP	COPY	
Admitting Diagnoses Description	0008,1080	LO		ANAP	COPY	

**Table 24: General Series Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP	COPY	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS	XA	ALWAYS	FIXED	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Operators' Name	0008,1070	PN		ANAP	COPY	
Performing Physician's Name	0008,1050	PN		ANAP	COPY	
Related Series Sequence	0008,1250	SQ		VNAP	AUTO	
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	
Performed Procedure Step Description	0040,0254	LO		ANAP	COPY	
Request Attributes Sequence	0040,0275	SQ		ANAP	COPY	

Table 25: General Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		ANAP	CONFIG	Configured Hospital Name
Device Serial Number	0018,1000	LO		ANAP	AUTO	Mac address of Hospital NIC
Manufacturer's Model Name	0008,1090	LO	EP navigator	ALWAYS	FIXED	
Software Versions	0018,1020	LO	5.6.x.y	ALWAYS	AUTO	Where "x.y" is the detailed application SW version.

Table 26: SC Equipment Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Modality	0008,0060	CS	XA/CT/MR	ALWAYS	AUTO	In Case Application Session: XA: In case of Study or Carto export depending on input data CT=>CT,MR=>MR, 3D-ATG => CT
Conversion Type	0008,0064	CS	WSD	ALWAYS	FIXED	copied from source data

Table 27: General Image Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Image Type	0008,0008	CS	DERIVED\ SECONDARY\ 3DSEG	ALWAYS	AUTO	For Study and Carto Export: DERIVED\ SECONDARY\ 3DSEG For Application Session: DERIVED\ SECONDARY
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Image Comments	0020,4000	LT	3Dseg	ALWAYS	FIXED	

Table 28: General Reference Module

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO	
> Referenced SOP class UID	0008,1150	UI		ALWAYS	AUTO	
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

**Table 29: Image Pixel Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	RGB, MONOCHROME 2	ALWAYS	AUTO	For Study and Carto Export: RGB, For Application Session: MONOCHROME2
Planar Configuration	0028,0006	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
High Bit	0028,0102	US	7	ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

**Table 30: SC Image Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	

**Table 31: Modality LUT Module**

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

**Table 32: VOI LUT Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Window Center	0028,1050	DS	0	ALWAYS	COPY	
Window Width	0028,1051	DS	0	ALWAYS	COPY	

**Table 33: SOP Common Module**

Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Specific Character Set	0008,0005	CS		ANAP	AUTO	As supported by hosting platform
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	



Attribute Name	TAG	VR	Value	Presence of Value	Source	Comments
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

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