

DICOM Conformance Statement

Application Annex:

US Applications on Philips IntelliSpace Portal V9.0



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1. Introduction

This DICOM Conformance Statement annex is applicable to the US Applications on Philips IntelliSpace Portal V9.0 hosting platform, later referred to as US Applications. In general the US Applications are used for viewing and analyzing the images from ultrasound modalities.

The following analysis packages are offered by US Applications (licensing might be applicable):

- Q-Lab
 - ROI(2D)
 - GI3DQ(3D)
 - IMT
 - ROI
 - MVI
 - GIPQ
 - EA
 - EQ
 - GI3DQ
 - VPQ

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	30-September-2016	Authorized	Final Version

1.2. Terminology

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

2. Data Specifications

2.1. Supported IOD's

This section specifies each IOD accepted and / or created by US Applications.

ACCEPTED	The applicable IOD is accepted for storage in the repository of the hosting platform and supported for import in US Applications for viewing and analysis.
CREATED	The US Applications supports generation of derived data by using the applicable IOD and are able to store this data in the repository of the hosting platform.

Table 2: Supported IOD's

IOD	Support		
		ACCEPTED	CREATED
Name	UID		
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes

2.1.1. Acceptance Criteria

This section specifies the acceptance criteria applied by US Applications 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

IOD		Transfer Syntax	
Name	UID	Name	UID
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		Implicit VR Little Endian	1.2.840.10008.1.2
		RLE Lossless	1.2.840.10008.1.2.5
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		Implicit VR Little Endian	1.2.840.10008.1.2
		RLE Lossless	1.2.840.10008.1.2.5
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70

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. Ultrasound Image Storage SOP Class

Table 5: IOD of Created Ultrasound 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
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	US Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 6: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	F, M, O

Table 7: General Study Module

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

Table 8: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS	US	ALWAYS	COPY	
Series Description	0008,103E	LO		VNAP	AUTO	
Protocol Name	0018,1030	LO		VNAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	

Table 9: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO	QLAB	ALWAYS	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	

Table 10: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ANAPCV	COPY	-
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Derivation Description	0008,2111	ST		ALWAYS	AUTO	
Source Image Sequence	0008,2112	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Burned In Annotation	0028,0301	CS	NO	ALWAYS	AUTO	
Lossy Image Compression Ratio	0028,2112	DS		ALWAYS	AUTO	

Table 11: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	COPY	
Photometric Interpretation	0028,0004	CS		ALWAYS	COPY	
Planar Configuration	0028,0006	US		ANAP	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Aspect Ratio	0028,0034	IS		ANAP	FIXED	
Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	
High Bit	0028,0102	US		ALWAYS	IMPLICIT	
Pixel Representation	0028,0103	US	0	ALWAYS	IMPLICIT	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 12: US Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	YBR_FULL_422	ALWAYS	AUTO	
Planar Configuration	0028,0006	US	0	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	
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	

Table 13: VOI LUT Module

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

Table 14: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	AUTO	Required if expanded/replacement character set used
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.6.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

Table 15: Extended DICOM and private attributes for Ultrasound Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS	SYN	ANAPCV	AUTO	

2.1.2.2. Ultrasound Multi-frame Image Storage SOP Class

Table 16: IOD of Created Ultrasound Multi-frame 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
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	CONDITIONAL – If present in the source data
Image	Image Pixel Module	CONDITIONAL – If present in the source data
Image	Cine Module	CONDITIONAL – If present in the source data
Image	Multi-Frame Module	CONDITIONAL – If present in the source data
Image	US Image Module	CONDITIONAL – If present in the source data
Image	VOI LUT Module	CONDITIONAL – If present in the source data
Image	SOP Common Module	ALWAYS

Table 17: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	USER	
Patient ID	0010,0020	LO		VNAP	USER	
Patient's Birth Date	0010,0030	DA		VNAP	USER	
Patient's Sex	0010,0040	CS		VNAP	USER	F, M, O

Table 18: 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	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	

Table 19: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAPCV	AUTO	
Series Time	0008,0031	TM		ANAPCV	AUTO	
Modality	0008,0060	CS	US	ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAPCV	AUTO	
Protocol Name	0018,1030	LO		ANAPCV	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	

Table 20: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO	QLAB	ALWAYS	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	

Table 21: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Derivation Description	0008,2111	ST	QLAB Clip	ALWAYS	AUTO	
Source Image Sequence	0008,2112	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.1	ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Burned In Annotation	0028,0301	CS	NO	ALWAYS	AUTO	
Lossy Image Compression Ratio	0028,2112	DS		ALWAYS	AUTO	

Table 22: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	COPY	
Photometric Interpretation	0028,0004	CS		ALWAYS	COPY	
Planar Configuration	0028,0006	US		ANAP	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Aspect Ratio	0028,0034	IS		ANAP	FIXED	
Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	
High Bit	0028,0102	US		ALWAYS	IMPLICIT	
Pixel Representation	0028,0103	US	0	ALWAYS	IMPLICIT	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 23: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time Vector	0018,1065	DS		ALWAYS	AUTO	

Table 24: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT	Value 1: 00181065	ALWAYS	AUTO	

Table 25: US Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Planar Configuration	0028,0006	US		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT	0x00181065	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, CONFIG	
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS	01	ALWAYS	AUTO	

Table 26: VOI LUT Module

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

Table 27: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP		Required if expanded/replacement character set used
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.3.1	ANAP		
SOP Instance UID	0008,0018	UI		ANAP		