



Cardiovascular IT BU – Node ID: 19174246

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Encompass DICOM Conformance Statement		

## DICOM Conformance Statement

### Encompass Review Station software

Encompass Review Station (ERS) software is an image reviewing software application that reads and displays DICOM- compliant x-ray angiographic and cardiac ultrasound studies from interchange media. ERS can also read studies that have been copied, or “preloaded” from CD-R to the local or network hard disk, or received directly from the modality and stored on a network hard disk..

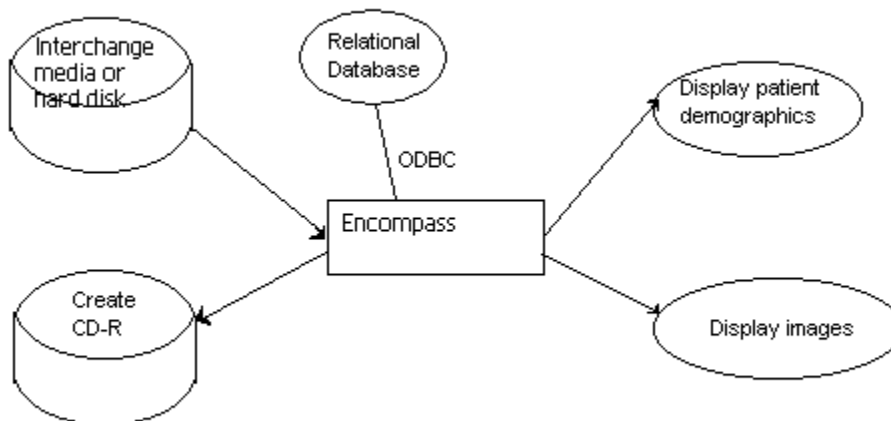
#### 1. Implementation Model

When requested by the user, the ERS opens, either from interchange media or local/network hard disk, the x-ray angiographic, cardiac ultrasound, nuclear cardiology, CT, or MRI study and reads the pertinent patient demographic information from the media. When the series is selected, the ERS presents icons representing each image.

When the user selects one of these icons, the Encompass application accesses the media to obtain the DICOM image data. The ERS then displays the image data.

##### 1.1 Application Data Flow Diagram

The ERS Application Entity (AE) handles the parsing and display of the images stored on media.





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- The ERS parses the DICOMDIR or other index and presents the study/series and images for review and selection.
- The ERS can preload image data from CD-R to any local or network available hard drive.
- The ERS can manage online information by copying selected series to selected destination media, hard disk or CD-R. CD-R disks created by the ERS are DICOM Part 10 compliant.
- The ERS displays the user-selected image data.

**1.2 Functional Definition of AE**

The ERS AE performs these function(s):

- Reads the DICOMDIR file for the presentation of basic patient demographics and image thumbnails.
- Displays the DICOM images.
- Preloads SOP Instances onto local storage. The ERS replaces the DICOMDIR with either a proprietary flat file database describing the contents of the preloaded studies or a relational database. Communication with the relational database is done with ODBC.
- Copies selected series from a selected source volume to a selected destination volume. The source volume may be either a CD or CD-R disk, or local or network available hard disk. The destination volume can be either a CD-R disk or local or network available hard disk.
- Takes user selected images and creates a DICOMDIR file for selected images when creating a CD-R. It then writes the DICOMDIR file and images out to a CD-R. The resultant CD-R is compliant to the DICOM Part 10 standard.

**1.3 Sequencing of Real World Activities**

To view an image, the ERS requires the user to either input a DICOM Part 10 compliant interchange medium or select a study/series from the available local or network media.

To create a CD-R, the user selects which study/series to write out to the CD-R disk. The user then loads the selected CD-R writer with a blank disk and then tells the ERS to write the disk. ERS alerts the user when it has finished writing the disk.

**1.4 Meta File Information for Implementation Class and Version**

The Encompass Implementation Class UID root is: 1.2.840.113815. Heartlab may append specific version identifiers to the UID root.



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**2. AE Specifications**

The DICOMDIR parser AE and Image Engine AE provide Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

**Table 2-1**

Supported SOP Classes as an SCU	SOP Class UID
X-ray angiographic image object	1.2.840.10008.5.1.4.1.1.12.1
Secondary Capture	1.2.840.10008.5.1.4.1.1.7
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Nuclear Cardiology Storage	1.2.840.10008.5.1.4.1.1.20
Computed Tomography (CT)	1.2.840.10008.5.1.4.1.1.2
Magnetic Resonance Imaging (MR)	1.2.840.10008.5.1.4.1.1.4
Little Endian Explicit Transfer Syntax	1.2.840.10008.1.2.1
Toshiba Aplio Ultrasound Private SOP	1.2.392.200036.9116.7.8.1.1.1
Big Endian Explicit Transfer Syntax	1.2.840.10008.1.2.2
JPEG Process 1, baseline, lossy (8 bit)	1.2.840.10008.1.2.4.50
RLE Lossless, PackBits	1.2.840.10008.1.2.5
JPEG Lossless Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70

**2.1 Media Specifications**

The Encompass ReviewStation supports the review of cases off of Basic Cardiac X-ray Angiographic Studies and cardiac ultrasound studies on interchange media. The operation is FSR (file set reader), or read only.

**Table 2-2**

*Application Profiles, Activities and Roles for Media Interaction*

Application Profiles Supported	Real World Activity	Role	SC Option
STD-US	Review	FSR	Interchange
STD-XABC-CD	Review	FSR	Interchange
STD-XA1K-CD	Review	FSR	Interchange
STD-GEN-CD	Review	FSR	Interchange
STD-CTMR-CD	Review	FSR	Interchange

**2.1.1 Real-World Activity**

The ERS acts as an FSR when copying from interchange media to local storage, or when reviewing directly off the interchange media. The ERS will filter out SOP Instances that do not match the Application Profile.

The ERS also acts as an FSC when copying images to CD-R for interchange.



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**3. Augmented and Private Profiles**

Not applicable.

**4. Communication Profiles**

Not applicable.

**5. Extensions/Specializations/Privitizations of SOP Classes and Transfer Syntaxes**

Not applicable.

**6. Configuration**

Not applicable.

**7. Support of Extended Character Sets**

Not applicable.

**8. Support for STD-XABC as a File Set Creator (FSC)**

Encompass acts as a FSC under the STD-XABC when writing Part 10 image files to CD-R for interchange. To comply with Part 11 of the DICOM Standard, Media Storage Application Profiles, Encompass creates files containing the following tags:

Attribute Name	Tag	Note
PatientName	(0010,0010)	
Patient_ID	(0010,0020)	
Patient_DOB	(0010,0030)	
Patient sex	(0010,0040)	
Patient birth time	(0010,0032)	
Other patient ID	(0010,1000)	
Other patient name	(0010,1001)	
Patient height	(0010,1020)	
Patient weight	(0010,1030)	
Patient ethnic group	(0010,2160)	
Patient comments	(0010,4000)	
StudyDate	(0008,0020)	
StudyTime	(0008,0030)	
Study Description	(0008,1030)	
Study Instance UID	(0020,000D)	
Study ID	(0020,0010)	



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Accession number	(0008,0050)	
Referring MD	(0008,0090)	(study)
Modality	(0008,0060)	
Performing MD	(0008,1050)	
Series Instance UID	(0020,000E)	
Series Number	(0020,0011)	
Laterality	(0020,0060)	
Series date	(0008,0021)	
Series time	(0008,0031)	
Protocol name	(0018,1030)	(series)
Series description	(0008,103E)	
Body part examined	(0018,0015)	(series)
Patient position	(0018,5100)	(series)
Operator	(0008,1070)	
Institution Address	(0008,0081)	
Station Name	(0008,1010)	
Institution Department Name	(0008,1040)	
Manufacturer	(0008,0070)	
Manufacturer's Model Name	(0008,1090)	
Device Serial Number	(0018,1000)	
SOP Class UID	(0008,0016)	
SOP Instance UID	(0008,0018)	
Image comments	(0020,4000)	
Institution name	(0008,0080)	
frame increment pointer	(0028,0009)	required
Radiation setting SC/GR	(0018,1155)	(low/high)
KVP peak kilo voltage of X-ray generator	(0018,0060)	
Exposure	(0018,1152)	
Positioner motion for multi frame cine	(0018,1500)	(Dynamic/Static)
Positioner primary angle	(0018,1510)	
Positioner secondary angle	(0018,1511)	
Frame Time	(0018,1063)	
Image type	(0008,0008)	required
Pixel intensity	(0028,1040)	required
Samples per pixel	(0028,0002)	
Photometric Interpretation	(0028,0004)	
Planar 0 or 1	(0028,0006)	
Number Frames	(0028,0008)	
Number Rows	(0028,0010)	
Number Columns	(0028,0011)	
Aspect Ratio	(0028,0034)	
Bits Allocated	(0028,0100)	
Bits Stored	(0028,0101)	
High Bit	(0028,0102)	
Pixel Representation	(0028,0103)	



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Image Number	(0020,0013)	
Patient Orientation	(0020,0020)	
Image Date	(0008,0023)	
Image Time	(0008,0033)	
Image Type	(0008,0008)	
Acquisition Number	(0020,0012)	
Acquisition Date	(0008,0022)	
Acquisition Time	(0008,0032)	
Derivation Description	(0008,2111)	
Images in Acquisition	(0020,1002)	
Calibration Image	(0050,0004)	
Rotation	(0020,0037)	
Pixel Size	(0028,0030)	In mm
Window Center	(0028,1050)	
Window Width	(0028,1051)	
Recommended Viewing Mode	(0028,1090)	
Modality LUT Sequence	(0028,3000)	
Modality LUT Descriptor	(0028,3002)	
Modality LUT Type	(0028,3004)	
Modality LUT Data	(0028,3006)	
Mask Subtraction Sequence	(0028,6100)	
Mask Operation	(0028,6101)	Only AVG_SUB
Mask Frame Numbers	(0028,6110)	
Pixel Data	(7FE0,0010)	

**9. File Set Creator**

Encompass also supports STD-US, STD-XA1K, STD-GEN-CD, and STD-CTMR-CD as a File Set Creator (FSC) when writing Part 10 image files to CD-R for interchange.

**10. File Set Reader**

Encompass acts as a File Set Reader (FSR) for reviewing STD-XABC, STD-XA1K, STD-US, STD-GEN-CD, and STD-CTMR-CD SOP Instances.



### Document Metadata

<b>Title:</b>	ERS DICOM Conformance Stmt.pdf
<b>Livelink ID:</b>	19174246
<b>Version#:</b>	4
<b>Version Date:</b>	2007/09/18 04:59 PM CET
<b>Status:</b>	Approved on 2007/09/18 05:02 PM CET
<b>Owner:</b>	Suzanne Townsend (awrcy)
<b>Created By:</b>	Suzanne Townsend (awrcy)
<b>Created Date:</b>	2007/09/18 03:39 PM CET

**This document was approved by:**

### Signatures:

1. Suzanne Townsend (awrcy) on 2007/09/18 05:01 PM CET

### Version & Status History

Version#	Date Created	Status
4	2007/09/18 04:59 PM CET	Approved - 2007/09/18
3	2007/09/18 04:52 PM CET	Approved - 2007/09/18
2	2007/09/18 04:45 PM CET	
1	2007/09/18 03:39 PM CET	