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**QDR DICOM
Conformance Statement**

Rev 002

Revision History

Rev	Date	Author	Reason for Change
1.0	20 Nov, 1997	J. Fallon	Initial Release
A	23 June, 1998	J. Fallon	Production Release
002	27 April, 2004	S. Krzysko	Update address, add Delphi

Summary

QDR DICOM is a software option for the DELPHI, QDR 4500 and QDR 4000 Bone Densitometers that generates a DICOM compliant (part 10) file containing scan and analysis results similar to that provided by the QDR OnePage report.

The resultant files can be moved to a specified DICOM device and manipulated using DICOM commands. Potential operations include viewing, archiving, printing, and databasing.

QDR DICOM is a Service Class User for storage. This means that files are moved from the QDR to a DICOM device over a DICOM network using the C-Store routine. The operator selects scans to be transmitted and provides an accession number and the resulting files are sent automatically to the selected DICOM device. Selected DICOM files can also be stored on standard media such as floppy disk for manual transmission, or sent over a network using network facilities such as ftp.

This option does not provide other DICOM Service Classes such as QUERY/STORE or Print Service. The DICOM file contains scan and analysis results. There is no capability to perform reanalysis from the contents of the DICOM file. The analysis results are embedded in the DICOM file in two forms: a comprehensive image, comprising the scan image, a reference graph, and text results, all in bitmapped form is provided for viewing on a DICOM viewer and the analysis results are provided in ASCII format in the Image Comments field of the DICOM file.

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1.0 Introduction

1.1 Purpose of the Document

This document describes conformance to the DICOM standard, version 3-1996 of the Hologic QDR DICOM module of the QDR Operating Software used on the DELPHI and QDR 4X00 Bone Densitometers.

1.2 References

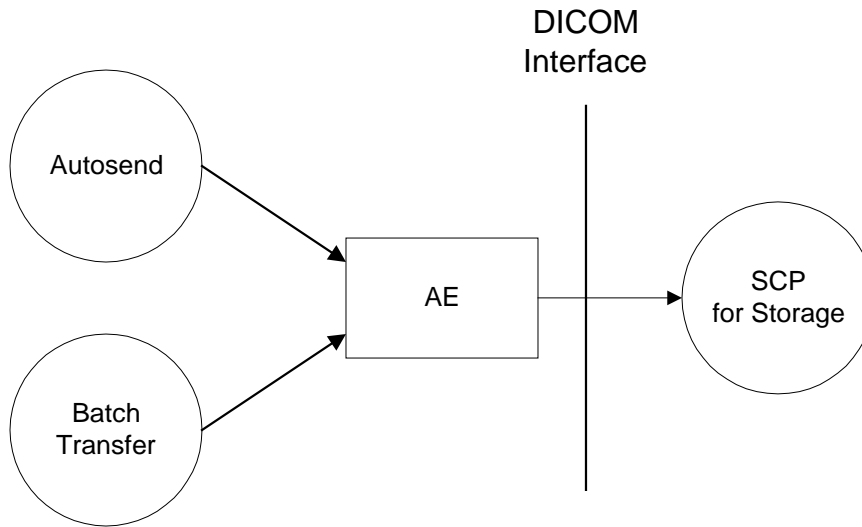
American College of Radiology - National Electrical Manufacturers Association (ACR-NEMA) Digital Imaging and Communications in Medicine v3.0-1996.

2.0 Implementation Model

QDR DICOM is available as an integral software module in the QDR Operating Software used to operate the Hologic DELPHI, QDR 4500 and QDR 4000 Bone Densitometers.

2.1 Application Data Flow Model

QDR DICOM is a single Application Entity. It can initiate associations to send files for storage.



2.2 Functional Definition of AE

QDR DICOM is a Service Class User for storage. It uses DICOM C-Store to send files to a remote SCP for Storage.

2.3 Sequencing of Real-World Activities

QDR DICOM will initiate a DICOM association and will use the C-Store command to send the files.

3.0 AE Specifications

3.1 Services

QDR DICOM provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU.

SOP Class Name	SOP Class UID
Secondary Capture Storage	1.2.840.10008.5.1.4.1.1.7

3.2 Association Establishment Policies

3.2.1 General

QDR DICOM limits PDU size to 16,384 bytes.

3.2.2 Number of Associations

QDR DICOM will initiate only one association at a time.

3.2.3 Asynchronous Nature

QDR DICOM does not permit asynchronous operations.

3.2.4 Implementation Identifying Information

The Implementation Identifying Information for QDR DICOM is:

Implementation Class UID	1.2.840.113850.1
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3.2.5 Association Initiation by Real-World Activity

QDR DICOM initiates a new association for two real-world activities:

1. Autosend. An operator produces a DICOM file upon completion of an analysis and the resulting file is sent automatically to one or more predetermined destinations.
2. Batch Transfer. An operator selects previously generated DICOM conformant files and sends them to a destination to be specified by the operator.

The DICOM association initiation and transfer process is identical in the two cases.

3.2.5.1 Associated Real-World Activity

QDR DICOM will send a QDR file to a DICOM Storage SCP.

3.2.5.2 Proposed Presentation Contexts

Presentation Context Table

Abstract	Syntax	Transfer	Syntax		Ext.
Name	UID	Name List	UID list		Neg.
Secondary Capture Storage	1.2.840.10008.5.1.4.1.1.7	Little Endian	1.2.840.10008.1.2	S C U	None

3.2.5.2.1 SOP Specific Conformance

Module	Attribute	Type	S	Value	Tag	VR	
Patient	Patient's Name	2	Q		0010, 0010	PN	
	Patient ID	2	Q		0010, 0020	LO	
	Patient's Birth Date	2	Q		0010, 0030	DA	
	Patient's Sex	2	Q		0010, 0040	CS	
General Study	Study Instance UID	1		Note 11	0020, 000D	UI	
	Study Date	2	Q		0008, 0020	DA	
	Study Time	2	Q		0008, 0030	TM	
	Referring Physician's Name	2	Q		0008, 0090	PN	
	Study ID	2		Note 1	0020, 0010	SH	
	Accession Number	2		Note 1	0008, 0050	SH	
	Study Description	3	Q		0008, 1030	LO	
	General Series	Modality	1		"OT"	0008, 0060	CS
		Series Instance UID	1		Note 11	0020, 000E	UI
		Series Number	2		Note 14	0020, 0011	IS
Laterality		2C	Q	Note 5	0020, 0060	CS	
	Body Part Examined	3	Q	Note 4	0018. 0015	CS	
General Equip.	Manufacturer	2		"Hologic"	0008, 0070	LO	
	Institution Name	3	Q		0008, 0080	LO	
	Station Name	3		Note 9	0008, 1010	SH	
	Manfr's Model Name	3	Q	Note 7	0008, 1090	LO	
	Device S/N	3	Q	Note 7	0018, 1000	LO	
	S/W Versions	3	Q	Note 7	0018, 1020	LO	
SC Equipment	Conversion Type	1		"WSD"	0008, 0064	CS	
	SC Device Software	3	Q	Note 8	0018, 1019	LO	

QDR DICOM Conformance Statement

Module	Attribute	Type	S	Value	Tag	VR
	Version					
General Image	Image Number	2		“1”	0020, 0013	IS
	Patient Orientation	2C	Q	Note 6	0020,0020	CS
	Image Comments	3	Q	Note 2	0020, 4000	LT
Image Pixel	Samples per pixel	1	Q	“1”	0028, 0002	US
	Photometric Interpretation	1	Q	Note 10	0028, 0004	CS
	Rows	1	Q		0028, 0010	US
	Columns	1	Q		0028, 0011	US
	Bits Allocated	1		Note 13	0028, 0100	US
	Bits Stored	1		Note 13	0028, 0101	US
	High Bit	1		Note 13	0028, 0102	US
	Pixel Representation	1		“0000H”	0028, 0103	US
	Pixel Data	1	Q		7FE0, 0010	OB
	Pixel Aspect Ratio	1C		“1\1”	0028, 0034	IS
SC Image	Date of Secondary Capture	3	Q	Note 3	0018, 1012	DA
	Time of Secondary Capture	3	Q	Note 3	0018, 1014	TM
Other	Window Center	3		Note 13	0028, 1050	DS
	Window Width	3		Note 13	0028, 1051	DS
SOP Common	SOP Class UID	1		Note 12	0008, 0016	UI
	SOP Instance UID	1		Note 11	0008, 0018	UI

Notes:

1. Accession number entered by operator is placed in both fields.
2. Text incorporating analysis results.
3. Date and time of analysis.
4. Body Part Values: LSPINE, HIP, ARM. For scan types not described by these values, place NULL in the field.
5. Required only for paired structures. Values are: R = right, L = left.
6. Patient Orientation Values A, P, R, L, H, F
7. These fields refer to the scan device.
8. These fields refer to the analyze device and software.

9. Station name is stored in a configuration table.

10. “MONOCHROME2”

11. All UIDs start with the following <org root>: 1.2.840.113850
(113850 represents a Hologic identifier assigned by ANSI).

The Study Instance UID consists of the <org root> followed by .nnnnn.yyyymmdd.sssss where nnnnn is the Hologic serial number of the scanner, yyyymmdd is the date, and sssss is the accession number, if available, or Hologic sequence number.

Example: 1.2.840.113850.3006.19971007.15

The Series Instance UID consists of the Study Instance UID with the series number appended.

Example: 1.2.840.113850.3006.19971007.15.1

The SOP Instance UID consists of the Series Instance UID followed by the analysis date and time.

Example: 1.2.840.113850.3006.19971007.15.1.19980415.1356

12. SOP Class UID for Secondary Capture Image Storage Service Class is
1.2.840.10008.5.1.4.1.1.7

13. Images can be either 8 or 12 bits deep. Values for each are:

	<u>8 bit</u>	<u>12 bit</u>
Bits Allocated	8	16
Bits Stored	8	12
High Bit	7	11
Window Center	128	2048
Window Width	256	4096

14. Series number starts at 1 and increases by 1 for each series in a study.

4.0 Communication Profiles

4.1 Supported Communication Stacks

QDR DICOM supports DICOM Upper Layer using TCP/IP (part 8).

4.2 TCP/IP Stack

QDR DICOM inherits its stack from the operating system on which it is running.

4.2.1 Physical media Support

QDR DICOM inherits the physical medium form the computer on which it is running.

5.0 Extensions/Specializations/Privatizations

The following fields have been added:

Attribute	Value	Tag
Window Center	“128”	0028, 1050
Window Width	“256”	0028, 1051

QDR DICOM uses the Image Comments field (0020, 4000) to carry QDR Bone Densitometer analysis results.

6.0 Configuration

6.1 AE Title/Presentation Address Mapping

The AE title can be configured at installation by the user.

6.2 Configurable Parameters

The following parameters are stored in a configuration table which can be edited by the user.

- Identification of both host and remote nodes
 - AE Title
 - IP Address
 - IP Mask
- Station name

7.0 Support of Extended Character Sets

No extended character sets are supported.