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Quality Control Workstation for the
Computed Radiography System 400

DICOM Conformance Statement

V4.00.01

April 3, 1998

Document # 6C6238

Computed Radiography Quality Control Workstation

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APPROVALS: Date

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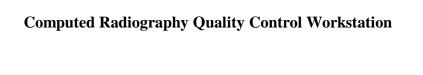
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Revision History

Date	Revision	Author	Description
06/20/95	Draft	Brian Lind	Draft
06/28/95		Brian Lind	Filled in missing information and misc. corrections
09/29/95		Brian Lind	Changed Implementation UID and updated option data elements
02/13/96		Trac M. Tran	Redefine scope and review document
07/01/96	A	Trac M. Tran	Final revision for Storage Class
08/15/96	B	Trac M. Tran	Add HIS/RIS conformance
09/06/96	C	Trac M. Tran	Add Print Management Conformance
01/17/97	D	Trac M. Tran	Change Pixel Spacing to Imager Pixel Spacing in storage
1/24/97	E	Trac M. Tran	Add Requested Image Size to support TRUE SIZE printing
10/24/97	F	Trac M. Tran	Add Exposure to C-Store
11/20/97	G	Trac M. Tran	Add more elements to HisRis and C-store for QCW_4.0
4/3/98	H	Trac manh Tran	Update Monochrome for c-store

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1. INTRODUCTION

The Quality Control Workstation (QCW) for the KODAK DIGITAL SCIENCE Computed Radiography System 400 DICOM Conformance Statement describes the DICOM services that will be used and/or provided.

1.1   Purpose and Scope

This Conformance Statement provides a high level description of operation of the QCW, the DICOM services it provides, and the DICOM services that are required from DICOM systems that wish to connect to the QCW.

1.2   Intended Audience

This Conformance Statement is intended as a reference for systems integrators who wish to connect QCW to other DICOM systems. The reader should be familiar with the DICOM Standard, since DICOM service will not be defined; but, referenced only.

1.3   Definitions, Acronyms, Abbreviations

ACR-NEMA	American College of Radiology - National Electrical Manufacturers Association
AE	Application Entity
ANSI	American National Standards Institute
CR	Computed Radiography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element-Composite
DIMSE-N	DICOM Message Service Element-Normalized
HIS	Hospital Information System
IOD	Information Object Definition
KESPR	KODAK DIGITAL SCIENCE Storage Phosphor Reader
LUT	Look-up Table
NEMA	National Electrical Manufacturers Association
OSI	Open Systems Interconnection
PACS	Picture Archive and Communication System
PDU	Protocol Data Unit
QCW	KODAK DIGITAL SCIENCE Quality Control Workstation for the Computed Radiography System 400
RIS	Radiology Information System
SCP	Service Class Provider

SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
VR	Value Representation

1.4   Related Documents

NEMA Standards Publication PS 3.1-1996, *Digital Imaging and Communications in Medicine (DICOM)*

2. IMPLEMENTATION MODEL

2.1 Application Data Flow Diagram

QCW Implementation Model

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2.2 Functional Definitions

This is the list of possible services sent/received by the QCW as an SCU:

SOP Class Name	Role	Services to send	Services to receive
Computed Radiography Image Storage	SCU	C-STORE request	C-STORE response
Detached Patient Management SOP Class	SCU	N-GET request	N-GET response
Detached Visit Management SOP Class	SCU	N-GET request	N-GET response
Detached Study Management SOP Class	SCU	N-GET request	N-GET response
Modality Worklist SOP Class	SCU	C-FIND request	C-FIND response
Basic Grayscale Print Management Meta SOP Class	SCU	N-CREATE request, N-SET request, N-ACTION request, N-DELETE request, N-GET request	N-CREATE response, N-SET response, N-ACTION response, N-DELETE response, N-GET response
Basic Annotation Box SOP Class	SCU	N-SET request	N-SET response

This is the list of possible services sent/received by the QCW as an SCU, associated with role negotiation by the remote HIS/RIS SCP.

SOP Class Name	Role	Services to send	Services to receive
Detached Patient Management SOP Class	SCU	N-EVENT-REPORT response	N-EVENT-REPORT request
Detached Visit Management SOP Class	SCU	N-EVENT-REPORT response	N-EVENT-REPORT request
Detached Study Management SOP Class	SCU	N-EVENT-REPORT response	N-EVENT-REPORT request

2.3 Sequencing of Real-World Activities

2.3.1 Computed Radiography Image Storage SOP Class

The QCW will initiate an association and use the C-STORE-RQ service to send images to remote image viewing stations, image archives or other types of DICOM C-STORE providers.

After receipt of C-STORE-RSP status of Success, the CR Image Object may be deleted from the QCW, and the association will be released.

C-STORE-RSP statuses of type Warning (0xBxxx) will be logged and warned, but no corrective action will be taken and the Warning will be treated the same as a Success.

C-STORE-RSP statuses of type ERROR will be logged, the Image Object will be saved to disk, warning to the operator will be displayed, and the association will be released.

2.3.2   Detached Patient Management SOP Class

The remote HIS/RIS AE will initiate an association with role negotiation as an SCP and use the N-EVENT-REPORT request service to send a patient event to the QCW.

The QCW will initiate an association and use the N-GET request service to retrieve patient information from the remote HIS/RIS AE.

After collecting the patient information, the QCW will close the association it opened.

The QCW will send the N-EVENT-REPORT response with status of SUCCESS to the remote HIS/RIS AE after the patient information has been satisfactorily received.

The QCW will send the N-EVENT-REPORT response with status of ERROR to the remote HIS/RIS AE if the resending of the patient information is needed.

The remote HIS/RIS AE is expected to close the association it opened.

2.3.3   Detached Visit Management SOP Class

The remote HIS/RIS AE will initiate an association with role negotiation as an SCP and use the N-EVENT-REPORT request service to send a visit event to the QCW.

The QCW will initiate an association and use the N-GET request service to retrieve visit information from the remote HIS/RIS AE.

After collecting the visit information, the QCW will close the association it opened.

The QCW will send the N-EVENT-REPORT response with status of SUCCESS to the remote HIS/RIS AE after the visit information has been satisfactorily received.

The QCW will send the N-EVENT-REPORT response with status of ERROR to the remote HIS/RIS AE if the resending of the visit information is needed.

The remote HIS/RIS AE is expected to close the association it opened.

2.3.4   Detached Study Management SOP Class

The remote HIS/RIS AE will initiate an association with role negotiation as an SCP and use the N-EVENT-REPORT request service to send a study event to the QCW.

The QCW will initiate an association and use the N-GET request service to retrieve study information from the remote HIS/RIS AE.

After collecting the study information, the QCW will close the association it opened.

The QCW will send the N-EVENT-REPORT response with status of SUCCESS to the remote HIS/RIS AE after the study information has been satisfactorily received.

The QCW will send the N-EVENT-REPORT response with status of ERROR to the remote HIS/RIS AE if the resending of the study information is needed.

The remote HIS/RIS AE is expected to close the association it opened.

2.3.5 Modality Worklist SOP Class

The QCW will initiate an association and use the C-FIND request service to retrieve demographic information from the remote HIS/RIS AE.

After collecting the demographic information, the QCW will close the association it opened.

All statuses of WARNING or ERROR will be logged, but no corrective action will be taken and no retries requested.

2.3.6 Basic Grayscale Print Management Meta SOP Class with Optional Basic Annotation Box SOP Class

The QCW will initiate an association and use N-GET printer status to test the printer, then use N-CREATE Film Session requests, N-CREATE Film Box Requests, N-SET Image Box requests, N-SET Basic Annotation Box requests and N-ACTION Film Box requests to send images to remote Printers SCP.

After receipt of N-ACTION-RSP status of SUCCESS, the Image Objects will be deleted from the QCW, and the association will be released.

All statuses of type WARNING (0xBxxx) will be logged and warned, but no corrective action will be taken and the Warning will be treated the same as a Success.

All statuses of type ERROR will be logged, all Image Objects of the Session will be saved to resend later, warning to the operator will be displayed, and the association will be released.

All printer statuses of FAILURE (from N-GET-RSP) will be treated as type ERROR, printer statuses of WARNING will be treated as type WARNING, and printer statuses of NORMAL will be treated as SUCCESS.

The QCW will not process the unsolicited Printer SOP Class N-EVENT-REPORT request.

3. QCW SPECIFICATION

3.1   SOP Classes Supported

The QCW provides Standard Conformance to the following DICOM V3.0 SOP Classes

SOP Class Name	Role	SOP Class UID
Computed Radiography Image Storage*	SCU	1.2.840.10008.5.1.4.1.1.1
Detached Patient Management SOP Class	SCU	1.2.840.10008.3.1.2.1.1
Detached Visit Management SOP Class	SCU	1.2.840.10008.3.1.2.2.1
Detached Study Management SOP Class	SCU	1.2.840.10008.3.1.2.3.1
Modality Worklist SOP Class	SCU	1.2.840.10008.5.1.4.31
Basic Grayscale Print Management Meta SOP Class	SCU	1.2.840.10008.5.1.1.9
Basic Annotation Box SOP Class	SCU	1.2.840.10008.5.1.1.15

*The QCW provides conformance to a Standard Extended Computed Radiography Image Storage SOP Class by supporting **the Imager Pixel Spacing element (0018,1164), the Pixel Spacing element (0028,0030) and additional defined terms on Body Part (0018,0015) on Patient Position (0018,5100) and on View Position (0018, 5101)**.

3.2   Association Establishment Policies

3.2.1   Number of Associations

The total maximum number of open associations is 12 (10 for Storage / Print associations, 1 for HIS/RIS N-EVENT-REPORT association, 1 for HIS/RIS N-GET or C-FIND association).

3.2.2   Called Ap (AE) Titles

The Called Ap (AE) Titles are configurable for each destination.

3.2.3   Asynchronous Nature

The QCW supports Synchronous mode only.

3.2.4   Max PDU

The Max PDU (the maximum size of the receiving PDU block) of the QCW is 128K.

If the remote AE negotiates a smaller value, the smaller value will be used for sending. The QCW will not send any PDU size larger than its own Max PDU.

The QCW will receive any PDU size smaller or equal to but not greater than its Max PDU.

3.2.5   Implementation Identifying Information

The QCW's Implementation Class UID is **1.2.840.113564.5.1** and the Implementation Version
Name is the QCW software version number.

3.3   Association Initiation Policy

The following Presentation Contexts are used by QCW to initiate an association.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			**Ext.**
Name	**UID**	**Name List**	**UID**	**Role**	**Negot**
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Detached Patient Management	1.2.840.10008.3.1.2.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Detached Visit Management	1.2.840.10008.3.1.2.2.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Detached Study Management	1.2.840.10008.3.1.2.3.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Modality Worklist	1.2.840.10008.5.1.4.31	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Annotation Box SOP Class	1.2.840.10008.5.1.1.15	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.3.1   Computed Radiography Image Storage Association Initiation

The QCW will initiate an association when it wishes to send an image. If an association fails or
is aborted, the QCW will retry the initialization at a later time when it is free to do so.

The QCW will abort an association when timed out. The timeout is configurable from 10 secs to
1 hour. Any image not successfully sent will be saved.

3.3.2 Detached Patient/Visit/Study Management Association Initiation

The QCW will initiate an association when it had accepted an association from the remote AE and had received an N-EVENT-REPORT request indicating demographic information is needed. If the initiated association fails or being released/aborted the QCW will send a N-EVENT-REPORT response with a status of ERROR to the remote AE.

3.3.3 Modality Worklist Association Initiation

The QCW will initiate an association when it wishes to retrieve new demographic information from the remote AE. If the initiated association fails or being released/aborted the QCW will not retry.

3.3.4 Basic Grayscale Print Management with Optional Basic Annotation Box Association Initiation

The QCW will initiate an association when it wishes to print. If an association fails or being released/aborted the QCW will retry the initialization at a later time when it is free to do so.

The QCW will abort an association when timed out. The timeout is configurable from 10 secs to 1 hour. All images of the session will be saved and will be resent when the QCW is free to do so.

3.4 Association Acceptance Policy

The following Presentation Contexts are acceptable for QCW to accept an association.

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Ext.
Name	UID	Name List	UID	Role	Negot
Detached Patient Management	1.2.840.10008.3.1.2.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Role negotiation indicating the HIS/RIS is an SCP
Detached Visit Management	1.2.840.10008.3.1.2.2.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Role negotiation indicating the HIS/RIS is an SCP
Detached Study Management	1.2.840.10008.3.1.2.3.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Role negotiation indicating the HIS/RIS is an SCP

3.4.1   Detached Patient/Visit/Study Management Association Acceptance

The QCW will accept an association with role negotiation to assume the role of an SCU. As a negotiated SCU, it only processes N-EVENT-REPORT requests.

3.5   SOP Specific Conformance Statements

3.5.1   SOP Specific Conformance for Computed Radiography Image Storage C-STORE Request.

The QCW provides conformance to a Standard Extended Computed Radiography Image Storage SOP Class by supporting **the Imager Pixel Spacing element (0018,1164), the Pixel Spacing element (0028,0030), the Admitting Diagnosis Description (0008,1080), and additional terms on Body Part (0018,0015) on Patient Position (0018,5100) and on View Position (0018, 5101)**.

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Type	Description
(0008,0008)	Image Type	3	"ORIGINAL\PRIMARY"
(0008,0012)	Instance Creation Date	3	
(0008,0013)	Instance Creation Time	3	
(0008,0020)	Study Date	2	
(0008,0021)	Series Date	3	
(0008,0023)	Image Date	2C	
(0008,0030)	Study Time	2	
(0008,0031)	Series Time	3	
(0008,0033)	Image Time	2C	
(0008,0050)	Accession Number	2	RIS compatible number
(0008,0060)	Modality	1	"CR"
(0008,0070)	Manufacturer	2	"Kodak"
(0008,0080)	Institution Name	3	
(0008,0090)	Referring Physician Name	2	
(0008,1010)	Station Name	3	
(0008,1030)	Study Description	3	
(0008,1040)	Institutional Department Name	3	

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(0008,1050)	Performing Physician's Name	3	
(0008,1060)	Name of Physician (s) Reading Study	3	Physician(s) reading the study
(0008,1070)	Operator's Name	3	
(0008,1080)	Admitting Diagnosis Description	3	Description of admitting diagnosis
(0008,1090)	Manufacturer's Model name	3	Configurable ("CR")
(0010,0010)	Patient's Name	2	
(0010,0020)	Patient's ID	2	
(0010,0030)	Patient's Birthday	2	
(0010,0040)	Patient's Sex	2	M, F,O
(0010,1000)	Other Patient IDs	3	Other identification numbers or codes used to identify the patient
(0018,0010)	Contrast/Bolus Agent	2C	Contrast or bolus agent
(0018,0015)	Body Part Examined	2	SKULL,CSPINE,TSPINE,LSPINE,SSPINE,COCCYX, CHEST,CLAVICLE,BREAST,ABDOMEN,PELVIS,HIP,SHOULDER, ELBOW,KNEE,ANKLE,HAND,FOOT,EXTREMITY,(**and these additional terms:) OTHER, FOREARM, HUMERUS, WRIST, FEMUR,TIB/FIB, PATTERN, PED CHEST, PED ABD.**
(0018,0060)	KVP (peak Kilo Voltage)	3	value in kV.
(0018,1000)	Device Serial Number	3	
(0018,1004)	Plate ID	3	
(0018,1020)	Software Version	3	
(0018,1111)	Distance Source to Patient	3	value in mm
(0018,1152)	Exposure	3	value in mAs
(0018,1164)	**Imager Pixel Spacing**	**3**	**row\column in mm to express the pixel spacing on the phosphor plate.**
(0018,1402)	Cassette Orientation	3	LANDSCAPE, PORTRAIT.
(0018,1403)	Cassette Size	3	18CMX24CM, 8INX10IN, 24CMX30CM, 10INX12IN, 30CMX35CM, 30CMX40CM, 11INX14IN, 35CMX35CM, 35CMX43CM.
(0018,5100)	Patient Position	2C	HFP,HFS,HFDR,HFDL,FFP,FFS,FFDR,FFDL,(**and these additional terms:) OTHER, LLD_POS, RLD_POS, ERECT, SEMIERECT, SUPINE.**

(0018,5101)	View Position	2	AP,PA,LL,RL,RLD,LLD,RLO,LLO,**(and these additional terms:) OTHER, RPO, RAO, LAO,LATERAL, XTABLE.**
(0020,000d)	Study Instance UID	1	unique UID
(0020,000e)	Series Instance UID	1	unique UID
(0020,0010)	Study ID	2	
(0020,0011)	Series Number	2	Always 1.
(0020,0013)	Image Number	2	
(0020,0060)	Laterality	2C	
(0020,1002)	Images in acquisition	3	1 only
(0020,4000)	Image Comments	3	
(0028,0002)	Sample per pixel	1	1 (1 plane for Monochrome)
(0028,0004)	Photometric Interpretation	1	MONOCHROME1 (minimum sample value = white) when Density space is sent MONOCHROME2 when Luminance space is sent.
(0028,0010)	Rows	1	
(0028,0011)	Columns	1	
(0028,0030)	**Pixel Spacing** **(FOR BACKWARD COMPATIBILITY ONLY, TO BE PHASED OUT IN FUTURE RELEASE)**	**3**	**same value as in Imager Pixel Spacing (row\column in mm) to express the pixel spacing on the phosphor plate, NOT on the body part.** **(FOR BACKWARD COMPATIBILITY ONLY, TO BE PHASED OUT IN FUTURE RELEASE)**
(0028,0100)	Bits Allocated	1	16 only
(0028,0101)	Bits Stored	1	12 only
(0028,0102)	High Bit	1	11 only
(0028,0103)	Pixel Representation	1	0000H only (Unsigned Integer)
(0028,1050)	Window Center	3	
(0028,1051)	Window Width	1C	
(0028,3000)	Modality LUT Sequence	3	Optional depending on configuration *.
>(0028,3002)	>LUT descriptor	1C	0x1000 0x0000 0x0010 (4096,0,16)
>(0028,3003)	>LUT Explanation	3	
>(0028,3004)	>Modality LUT Type	1C	"US".
>(0028,3006)	>LUT Data	1C	4096 of 16 bits LUT data
(0028,3010)	VOI LUT sequence	3	Optional depending on configuration *.
(0032,1030)	Reason for Study	3	Describes the reason for performing study

(0032,1060)	Requested Procedure Description	3	Institution-generated description or classification of requested procedure

* The QCW may be configured to send image with the LUT already applied to it or to send the Image data and the LUT data separately. The LUT is chosen from a pool of predefined LUTs. The configuration affects the whole system, individual destination configuration is not possible.

3.5.2   SOP Specific Conformance Statement for receiving the Detached Patient/Visit/Study Management N-EVENT-REPORT request:

This is the common header:

Tag	Element Name	Type	Description
(0000,0000)	Group length	1	
(0000,0002)	Affected SOP Class UID	1	"1.2.840.10008.3.1.2.1.1" (Det. Patient Mgnt) or "1.2.840.10008.3.1.2.2.1" (Det. Visit Mgnt) or "1.2.840.10008.3.1.2.3.1" (Det. Study Mgnt)
(0000,0100)	Command field	1	0100H
(0000,0110)	Message ID	1	
(0000,0800)	Data Set Type	1	
(0000,1000)	Affected SOP Instance UID	1	
(0000,1002)	Event Type ID	1	1..3 for "1.2.840.10008.3.1.2.1.1 " (Det. Patient Mgnt) 1..7 for "1.2.840.10008.3.1.2.2.1 " (Det. Visit Mgnt) 1..9 for "1.2.840.10008.3.1.2.3.1 " (Det. Study Mgnt)
	Event Information		See the following tables for the specific Event Type ID

3.5.3   SOP Specific Conformance Statement for Detached Patient Management N-GET Request

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Match Type	Return Type	Description
(0008,1125)	Referenced Visit Sequence	3	2	
>(0008,1150)	>Referenced SOP Class UID	3	1C	
>(0008,1155)	>Referenced SOP Instance UID	3	1C	
(0008,1110)	Referenced Study Sequence	3	2	
>(0008,1150)	>Referenced SOP Class UID	3	1C	
>(0008,1155)	>Referenced SOP Instance UID	3	1C	
(0010,0010)	Patient's Name	3	2	
(0010,0020)	Patient's ID	3	2	

(0010,0030)	Patient's Birth Date	3	2	
(0010,0040)	Patient's Sex	3	2	
(0010,1000)	Other Patient IDs	3	2	

3.5.4 SOP Specific Conformance Statement for Detached Visit Management N-GET Request

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Match Type	Return Type	Description
(0008,0080)	Institution Name	3	3	
(0008,0090)	Referring Physician's Name	3	2	
(0008,1080)	Admitting Diagnosis Description	3	2	
(0008,1120)	Referenced Patient Sequence	3	1	
>(0008,1150)	>Referenced SOP Class UID	3	1C	
>(0008,1155)	>Referenced SOP Instance UID	3	1C	
(0008,1110)	Referenced Study Sequence	3	2	
>(0008,1150)	>Referenced SOP Class UID	3	1C	
>(0008,1155)	>Referenced SOP Instance UID	3	1C	
(0038,0300)	Current Patient Location	3	3	
(0038,0400)	Patient's Institution Residence	3	3	

3.5.5 SOP Specific Conformance Statement for Detached Study Management N-GET Request

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Match Type	Return Type	Description
(0008,0050)	Accession Number	3	3	
(0008,1060)	Reading Radiologist	3	3	
(0008,1120)	Referenced Patient Sequence	3	1	
>(0008,1150)	>Referenced SOP Class UID	3	1C	
>(0008,1155)	>Referenced SOP Instance UID	3	1C	
(0008,1125)	Referenced Visit Sequence	3	1	
>(0008,1150)	>Referenced SOP Class UID	3	1C	
>(0008,1155)	>Referenced SOP Instance UID	3	1C	
(0020,000D)	Study Instance UID	3	3	
(0020,0010)	Study ID	3	2	

(0032,1030)	Reason for Study	3	3	
(0032,1060)	Requested Procedure Description	3	3	

3.5.6 SOP Specific Conformance Statement for Modality Worklist C-FIND Requests

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Match Type	Return Type	Description
(0008,0050)	Accession Number	O	2	Request Key
(0008,0090)	Referring Physician's Name	O	2	
(0010,0010)	Patient's Name	R	1	
(0010,0020)	Patient's ID	R	1	
(0010,0030)	Patient's Birth Date	O	2	
(0010,0040)	Patient's Sex	O	2	
(0020,000D)	Study Instance UID	O	1	
(0032,1070)	Contrast/Bolus Agent	O	2	
(0038,0300)	Current Patient Location	O	2	
(0040,0006)	Performing Physician	O	2	
(0040,0010)	Station Name	O	2	

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Match Type	Return Type	Description
(0010,0010)	Patient's Name	R	1	
(0010,0020)	Patient's ID	R	1	Request Key
(0010,0030)	Patient's Birth Date	O	2	
(0010,0040)	Patient's Sex	O	2	

3.5.7 SOP Specific Conformance Statement for Basic Film Session SOP Class N-CREATE Request

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Type	Description
(2000,0010)	Number of copies	U	Selectable as "1".."99"

(2000,0020)	Print Priority	U	Selectable as "HIGH", "MED", default "LOW"
(2000,0030)	Medium Type	U	Configurable as "CLEAR FILM", "BLUE FILM", default "NONE"
(2000,0040)	Film Destination	U	Configurable as "MAGAZINE", "PROCESSOR", "CURRENT", default "MAGAZINE
(2000,0050)	Film Session Label	U	These Demographic data are used to identify the Film Session: R# (requisition number), Part (part of body), Expo (exposition date) , Scale (scale of image)
(2000,0060)	Memory Allocation	U	Amount of memory in Kbytes

3.5.8 SOP Specific Conformance Statement for Basic Film Session SOP Class N-SET Request

Not supported.

3.5.9 SOP Specific Conformance Statement for Basic Film Session SOP Class N-DELETE Request

QCW provides standard conformance.

3.5.10 SOP Specific Conformance Statement for Basic Film Session SOP Class N-ACTION Request

Not supported.

3.5.11 SOP Specific Conformance Statement for Basic Film Box SOP Class N-CREATE Request

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Type	Description
(2010,0010)	Image Display Format	M	"STANDARD\C,R" where (C,R) = (1,1) For Future Enhancement: (1,2) (2,1) (2,2)
(2010,0030)	Annotation Display Format ID	U	Configurable: -Example for KODAK DIGITAL SCIENCE MEDICAL LASER PRINTER 190: "1" -Example for Imation(TM) Print Servers: "COMBINED"
(2010,0040)	Film Orientation	U	"PORTRAIT", "LANDSCAPE"

(2010,0050)	Film Size ID	U	"8INX10IN", "11INX14IN","14INX17IN"
(2010,0060)	Magnification Type	U	"REPLICATE", "BILINEAR", "CUBIC", "NONE" (No preference)
(2010,0080)	Smoothing Type	U	Configurable: -Example for KODAK printers: "NORMAL" -Example for Imation(TM) Print Servers: "8"
(2010,0100)	Border Density	U	"BLACK"
(2010,0120)	Min Density	U	Configurable 0..299.
(2010,0130)	Max Density	U	Configurable 0..300.
(2010,0140)	Trim	U	"YES"
(2010,0150)	Configuration Information	U	Configurable: -Example for KODAK DIGITAL SCIENCE MEDICAL LASER PRINTER 190: "CS000\TM%SES%%PRNTDAT%" -Example for other KODAK printers: "CS000" (linear curve shape) See Annex A Configuration Information for further description. -Example for Imation(TM) Print Servers: "LUT=0,8"
(2010,0500)	Referenced Film Session Sequence	M	
>(0008,1150)	>Referenced SOP Class UID	M	
>(0008,1155)	>Referenced SOP Instance UID	M	

3.5.12 SOP Specific Conformance Statement for Basic Film Box SOP Class N-SET Request

Not supported.

3.5.13 SOP Specific Conformance Statement for Basic Film Box SOP Class N-DELETE Request

QCW provides standard conformance.

3.5.14 SOP Specific Conformance Statement for Basic Film Box SOP Class N-ACTION Request

QCW provides standard conformance.

3.5.15 SOP Specific Conformance Statement for Basic Grayscale Image Box SOP Class N-SET Request

The following table lists all supported elements sorted by tag number.

Tag	Element Name	Type	Description
(0008,0020)	Study Date	3	
(0008,0030)	Study Time	3	
(0008,0050)	Accession Number	3	RIS compatible number
(0008,0060)	Modality	3	"CR"
(0008,0090)	Referring Physician Name	3	
(0010,0010)	Patient's Name	3	
(0010,0020)	Patient's ID	3	
(0010,0030)	Patient's Birthday	3	
(0010,0040)	Patient's Sex	3	M, F,O
(0020,0010)	Study ID	3	
(0020,0013)	Image Number	3	
(2010,0060)	Magnification Type	U	Same as for Basic Film Box.
(2010,0080)	Smoothing Type	U	Same as for Basic Film Box.
(2020,0010)	Image Position	M	All values within the range of Image Display Format
(2020,0020)	Polarity	U	"NORMAL"
(2020,0030)	Requested Image Size	U	Value in mm. Depending on configuration of each printer, this value will be either the horizontal measurement (X-axis) or the vertical measurement (Y-axis) of the image. The default is the horizontal measurement (X-axis). If the image(s) cannot fit into the film, a reduced value and a SCALE will be given, the SCALE value is given in the Film Session Label or in the annotation text.
(2020,0110)	Preformatted Grayscale Image Sequence	M	
>(0028,0002)	>Samples Per Pixel	M	1
>(0028,0004)	>Photometric Interpretation	M	"MONOCHROME1" only (Only Density space is

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			sent)
>(0028,0010)	>Rows	M	
>(0028,0011)	>Columns	M	
>(0028,0034)	>Pixel Aspect Ratio	M	R\C = Row value (delimiter "\") Column value
>(0028,0100)	>Bits Allocated	M	16
>(0028,0101)	>Bits Stored	M	12
>(0028,0102)	>High Bit	M	11
>(0028,0103)	>Pixel Representation	M	0
>(7FE0,0010)	>Pixel Data	M	

3.5.16   SOP Specific Conformance Statement for Printer SOP Class N-GET Request

QCW provides standard conformance.

3.5.17   SOP Specific Conformance Statement for Printer SOP Class N-EVENT-REPORT Response

Not Supported.

3.5.18   SOP Specific Conformance Statement for Basic Annotation Box SOP Class N-SET Request

Tag	Element Name	Type	Description
(2030,0010)	Annotation Position	M	Printer dependent: -Default : 1 -Example for KODAK DIGITAL SCIENCE MEDICAL LASER PRINTER 190: 1 (bottom of page) -Example for IMATION(TM) Print servers: -first annotation: 0 (top of page) -second annotation: 1 or 2 (depending on format of 1or 2 up) for bottom of page.
(2030,0020)	Text string	U	These demographic data are sent on the first annotation box: ID (Patient_ID), Patient (name), Sex. If the Film Session Label printing is not supported (ex IMATION(TM) Print Servers), these demographic data are sent on the second annotation box:

			R# (requisition number), Part (part of body), Expo(exposition date) , Scale (scale of image)

4. COMMUNICATION PROFILES

4.1 Supported Communications Stacks

QCW provide standard TCP/IP Network Communication Support.

4.2 Physical Media

This implementation supports any physical media that the underlying hardware (Sun SPARC) supports, provided there exists a TCP/IP stack implementation for the physical media. The following cables and connectors are included:

- Unshielded Twisted Pair (10BaseT) with RJ45 connector

- Thick Net (10Base5) with AUI connector

- Thin Net (10Base2) with BNC connector (requires transceiver)

5. CONFIGURATION

The following parameters are system configurable:
- Calling Ap Title (QCW's AE Title).
- Transfer Syntax (default: Little Endian Implicit).
- Raw data or LUT applied (default: LUT applied)*.
- Min/Max Density.
- Number of copies.
- Print Priority.
- Timeout.
- Luminance or Density space for DICOM storage.

The following parameters are configurable per destination:
- IP address.
- Host Name.
- DICOM Port Number.
- Called Ap Title (Destination's AE Title).
- Film Box Configuration Information.
- Smoothing Type.
- Annotation Display Format ID.
- Film Destination.
- Requested Image Size preference (X-axis or Y-axis).

The following parameters are selectable per printer through the GUI:

- Number of copies.
- Print Priority (assisted processing GUI).

- The QCW may be configured to send image with the LUT already applied to it or to send the Image data and the LUT data separately. The LUT is chosen from a pool of predefined LUTs. The configuration affects the whole system, individual destination configuration is not possible. System with DICOM printers is recommended to have LUT applied.

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