

KODAK PACS Link 9410 Acquisition System

**DICOM Basic Print SCP
Conformance Statement**

Version 2.1

Oct. 24, 2000

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1. INTRODUCTION

This document provides the conformance statement for the KODAK™ PACS Link 9410 Acquisition System product.

The PACS Link 9410 Acquisition System from KODAK™ provides the bridge between a radiology department's imaging network and the KODAK Laser Imaging Systems. It enables radiologists to capture images at any networked DICOM modality and then print film sessions anywhere they're needed in the medical facility.

Benefits:

- **Compatibility:**

The KODAK™ PACS Link 9410 Acquisition System accepts DICOM 3.0 print management service class image data from the network and translates it for fast, affordable filming through KODAK™ DryView™, KODAK™ 969 HQ, and KODAK™ 959 XL Laser Imagers from KODAK™.

- **Upgradable:**

The PACS Link 9410 Acquisition System offers the scalability needed to expand a network. Built on a standard NT based computer, it is easy to expand the PACS Link 9410 Acquisition System's internal memory or increase its transmission speeds with high-speed Ethernet, FDDI or ATM boards.

- **Productivity:**

The ability to link KODAK Laser Imagers to the network with the PACS Link 9410 Acquisition System facilitates the cost-cutting and productivity-enhancing concept of decentralized medical imaging. This capability grows more important as radiology facilities implement new imaging innovations, such as the KODAK™ DryView™ Laser Imaging technology.

1.1 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 EKTASCAN Storage Phosphor Reader
LUT	Look-up Table
NEMA	National Electrical Manufacturers Association
OSI	Open Systems Interconnection
PACS	Picture Archive and Communication System

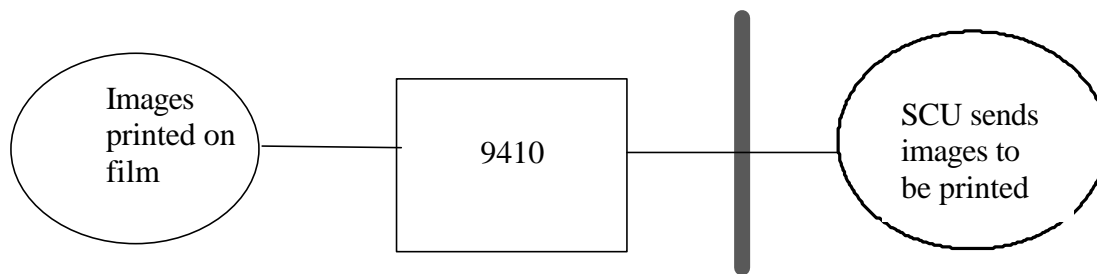
PDU	Protocol Data Unit
QCW	KODAK DIGITAL SCIENCE Computed Radiography Quality Control Workstation.
RIS	Radiology Information System
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
VR	Value Representation

2. IMPLEMENTATION MODEL

The KODAK™ PACS Link 9410 Acquisition System is a single Application Entity which provides the services of the DICOM Print Management Service Class. It accepts print parameters from Print Management Service Class users and prints on KODAK Laser Imagers.

2.1 KODAK PACS Link 9410 Data Flow Diagram

The KODAK PACS Link 9410 Acquisition System receives print parameters (defined at film session, film box, image box, and annotation box levels) from a DICOM Print Management Service Class User (PMSCU), and prints them on KODAK Laser Imagers. Multiple associations with SCU's are supported.



DICOM Interface

2.2 Functional Definition of KODAK 9410 Application Entity

The KODAK PACS Link 9410 Acquisition System provides the DICOM Print Management Service Class Provider support required to print images received from one or more SCU's. The functionality supported by the KODAK PACS Link 9410 Acquisition System includes:

- DICOM Association Management
- Image Buffering
- Image Manipulation

- Image Formatting
- Printing
- Print Job Recovery
- Print Job Status Tracking

2.3 Sequencing of Real World Activities

Real world activities are sequenced as required to meet the definition of the Print Management Service Class. No additional sequencing activity is needed. In a multi-modality environment, film sessions with multiple sheets may be interspersed with prints originated from the other modalities.

When an SCU requests to delete a film box in a collated film session, the KODAK PACS Link 9410 Acquisition System only allows the deletion of the currently open film box. When a new film box is created, the previous film boxes are closed. In other words, the SCU cannot modify the attributes of or delete the closed film boxes.

3. AE SPECIFICATIONS

The PACS Link System exists as a single Application Entity (AE). The specification for this AE is described within this section.

3.1 KODAK PACS Link 9410 Acquisition System Application Entity Specification

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP:

SOP Classes as SCP	
SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16
Basic Annotation Box	1.2.840.10008.5.1.1.15
Print Job	1.2.840.10008.5.1.1.14
Presentation LUT	1.2.840.10008.5.1.1.23

3.1.1 Association Establishment Policies

3.1.2 General

The KODAK PACS Link 9410 Acquisition System accepts an association from an SCU for the supported SOP classes. Once the maximum allowable number of associations has been reached, additional association requests will be accepted, then immediately aborted.

The Maximum Length PDU negotiated during association establishment is 1 MByte.

3.1.3 Number of Associations

The number of simultaneous associations supported in the KODAK PACS Link 9410 Acquisition System is configurable by the system administrator. The number configured should be determined by the amount of resources (CPU, memory, hard disk size, etc.) available and the expected processing performance required. Currently, the default number of simultaneous associations is 5.

3.1.4 Asynchronous Nature

Multiple outstanding transactions are not supported. The KODAK PACS Link 9410 Acquisition System only allows a single outstanding operation on an association. Therefore, the KODAK PACS Link 9410 Acquisition System does not perform asynchronous operations.

3.1.5 Implementation Identifying Information

The KODAK PACS Link 9410 Acquisition System will provide an implementation version name. The version name is "9410".

The KODAK PACS Link 9410 Acquisition System Implementation Class UID is "1.2.840.113720.1.9410.2".

3.1.6 Association Initiation Policy

The KODAK PACS Link 9410 Acquisition System SCP Print Server will never initiate an association.

3.1.7 Association Acceptance Policy

The KODAK PACS Link 9410 Acquisition System will accept an association to support the Basic Print Management Services listed in Section 2.2 above.

The KODAK PACS Link 9410 Acquisition System will always accept a legal association with the following exceptions:

1. There will be no response from the KODAK PACS Link 9410 Acquisition System during its system power-up.
2. If the number of associations has exceeded the configured limit, the most-recent association is immediately aborted by the KODAK PACS Link 9410 Acquisition System.

3.1.7.1 Print Management

This section describes the real-world activity designed to support image printing on a DICOM network.

3.1.7.1.1 Associated Real-World Activity

A remote peer DICOM Application Entity, acting as an SCU, establishes an association with the PACS Link 9410 Acquisition System to print images and image related data on a hard copy medium.

3.1.7.1.2 Presentation Context Table

The KODAK PACS Link 9410 Acquisition System supports the following **abstract syntax's** and **transfer syntax's** as a Print Management Service provider:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Basic Grayscale Print Management Meta SOP	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Basic Annotation Box	1.2.840.10008.5.1.1.15	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Print Job	1.2.840.10008.5.1.1.14	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Presentation LUT	1.2.840.10008.5.1.1.23	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

3.1.7.1.3 SOP Specific Conformance**3.1.7.1.3.1 SOP Specific Conformance to Verification SOP Class**

The KODAK PACS Link 9410 Acquisition System provides standard conformance to the DICOM Verification Service Class as an SCP. The status code for the C-ECHO is:

Code	Status	Meaning
0000	Success	The C-ECHO request is accepted.

3.1.7.1.3.2 SOP Specific Conformance to Basic Grayscale Print Management Meta SOP Class

The KODAK PACS Link 9410 Acquisition System supports the following mandatory SOP classes as defined by the Basic Grayscale Print Management Meta Class:

SOP Classes supported as a part of Basic Grayscale Print Management Meta SOP Class	
SOP Class Name	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2

Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16

The specific SOP Conformance statement for each of these SOP Class components is described in the subsequent sections.

3.1.7.1.3.2.1 Basic Film Session SOP Class

The KODAK PACS Link 9410 Acquisition System provides support for the optional N-ACTION DIMSE Service. Receipt of the N-ACTION will result in all films of the film session being printed in the order that they are received. The number of films that can be stored for print is limited by the size of the 9410's installed disk space and the number of SCUs sending images simultaneously.

The KODAK PACS Link 9410 Acquisition System provides the following support for the attributes contained in the N-CREATE DIMSE Service of the Basic Film Session SOP Class:

Attribute	Tag	Valid Range	Default Value if not sent by SCU	Response to Invalid Value
Number of Copies	(2000,0010)	1 - 99	1	Warning (0x116)
Print Priority	(2000,0020)	LOW MED HIGH	LOW	Warning (0x116)
Medium Type ^{1,2}	(2000,0030)	CLEAR FILM BLUE FILM CURRENT	CURRENT	Warning (0x116)
Film Destination ^{1,2}	(2000,0040)	MAGAZINE PROCESSOR CURRENT	CURRENT	Warning (0x116)
Film Session Label	(2000,0050)	Up to 64 characters	No default.	Warning (0x116)

Note 1: Refer to Appendix A for a summary of how these attributes are supported for specific KODAK Laser Imagers.

Note 2: Refer to Section 5.1 for a description of the attribute extension of CURRENT.

Implementation description for optional attributes supported is as follows:

Film Session Label - is accepted but ignored by the KODAK PACS Link 9410 Acquisition System software.

The behavior of all specific DIMSE Service status codes are as follows:

N-CREATE:

Code	Status	Meaning
0000	Success	Film session is successfully created. Some attributes may have different values than what was requested. The actual values of attributes are returned.
0116	Warning	Attribute out of range. The attribute in question is returned in the responses data set.
B600	Warning	Memory allocation not supported. A data set is returned with valid attributes/values.
0106	Failure	Invalid attribute value. A data set is returned of all invalid attributes/values.
0110	Failure	Processing failure: cannot decode the DIMSE attribute.
0117	Failure	Invalid object instance: instance UID given had incorrect syntax.
0213	Failure	Resource limitation: film session cannot be opened.

N-SET:

Code	Status	Meaning
0000	Success	Some attributes may have different values than what was requested. The actual values of attributes are returned.
0116	Warning	Attribute out of range. The attribute in question is returned in the responses data set.
B600	Warning	Memory allocation not supported. A data set is returned with valid attributes/values.
0106	Failure	Invalid attribute value. A data set is returned of all invalid attributes/values.
0110	Failure	Processing failure: cannot decode the DIMSE attribute.
0112	Failure	No such object instance: the instance UID given does not exist.

N-DELETE:

Code	Status	Meaning
0000	Success	Film session has been successfully deleted.
0112	Failure	No such object instance: the instance UID given does not exist.

N-ACTION:

Code	Status	Meaning
0000	Success	Films in the film session are accepted for printing. Print Job SOP instance is created and the instance UID is returned.
B602	Warning	Film Session SOP instance hierarchy does not contain Image Box SOP instances (empty page). Empty page will not be printed.
0112	Failure	No such object instance: the instance UID given does not exist.
0211	Failure	Unrecognized operation: the action ID type is not supported (i.e., not PRINT).
C600	Failure	Film Session SOP instance hierarchy does not contain Film Box SOP instances.
C601	Failure	Unable to create Print Job SOP instance; print queue is full.

3.1.7.1.3.2.2 Basic Film Box SOP Class

The KODAK PACS Link 9410 Acquisition System provides support for the optional N-SET DIMSE Service of the Basic Film Box SOP Class. The 9410 will allow the following Film Box attributes to be updated upon receipt of the N-SET:

Film Box attributes that can be updated by N-SET	
Attribute Name	Tag
Magnification Type	(2010,0060)
Max Density	(2010,0130)
Configuration Information	(2010,0150)
Smoothing Type	(2010,0080)
Border Density	(2010,0100)
Trim	(2010,0140)
Reference Presentation LUT Sequence	(2050,0500)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Illumination	(2010,015E)
Reflective Ambient Light	(2010,0160)

The KODAK PACS Link 9410 Acquisition System provides the following support for the attributes contained in the N-CREATE DIMSE Service of the Basic Film Box SOP Class:

Attribute	Tag	Valid Range	Default Value if not sent by SCU	Response to Invalid Value

Image Display Format	(2010,0010)	Details in next table	Mandatory, no default.	Failure (0x0106)
Referenced Film Session Sequence	(2010,0500)	N/A	N/A	N/A
> Referenced SOP Class UID	(0008,1150)	SOP Class UID	Mandatory, no default	Failure (0x0106)
> Referenced SOP Instance UID	(0008,1155)	SOP Instance UID	Mandatory, no default	Failure (0x0106)
Referenced Image Box Sequence	(2010,0510)	N/A	N/A	N/A
> Referenced SOP Class UID	(0008,1150)	SOP Class UID	Mandatory, no default	Failure (0x0106)
> Referenced SOP Instance UID	(0008,1155)	SOP Instance UID	Mandatory, no default	Failure (0x0106)
Film Orientation ¹	(2010,0040)	PORTRAIT LANDSCAPE	PORTRAIT	Warning (0x116)
Film Size Id ^{1,3}	(2010,0050)	8INX10IN 11INX14IN 14INX17IN CURRENT	CURRENT	Warning (0x116)
Magnification Type ¹	(2010,0060)	REPLICATE BILINEAR CUBIC NONE	Configurable	Warning (0x116)
Max Density ¹	(2010,0130)	170-350	320	Warning (0x116)

Configuration Information ^{1,4}	(2010,0150)	LUT = m,n m = a character string or 0, n = 0-15, the value is laser specific. CSxxx 000 ≤ xxx ≤ 015	m = a character string or 0, n is configurable.	Warning (0x116)
Annotation Display Format Id ¹	(2010,0030)	LABEL BOTTOM COMBINED NONE	NONE	Warning (0x116)
Smoothing Type ¹	(2010,0080)	0-15, the value is laser specific.	Configurable	Warning (0x116)
Border Density ¹	(2010,0100)	WHITE BLACK	BLACK	Warning (0x116)
Trim ¹	(2010,0140)	YES NO	NO	Warning (0x116)
Reference Presentation LUT Sequence	(2050,0500)	N/A	N/A	N/A
>Referenced SOP Class UID	(0008,1150)	SOP Class UID	Mandatory if sequence is present, no default	Failure (0x0106)
>Referenced SOP Instance UID	(0008,1155)	SOP Instance UID	Mandatory if sequence is present, no default	Failure (0x0106)
Illumination	(2010,015E)	Any valid value in the unit of cd/m ²	2000, Mandatory if Presentation LUT is supported	

Reflective Ambient Light	(2010,0160)	Any valid value in the unit of cd/m ²	10, Mandatory if Presentation LUT is supported	
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Note 1: Refer to Appendix A for a summary of how these attributes are supported for specific KODAK Laser Imagers.

Note 2: The Border Density value specified will also be used for Empty Image Density. The KODAK PACS Link 9410 Acquisition System does not support the Empty Image Density attribute.

Note 3: Refer to Section 5.1 for a description of the attribute extension of CURRENT.

Note 4: DICOM defined term CSxxx for Configuration Information supported with the following constraints:

1. Only values in the range of $000 \leq xxx \leq 015$ is supported.
2. Multiple terms are not supported by the PACS Link 9410 Acquisition System.

Implementation description for attributes is as follows:

Image Display Format - The following table lists the standard formats supported by KODAK Laser Imagers (refer to Appendix A for details):

Format	Support
STANDARD\C,R ¹	Supported C,R combinations: Portrait: 1,1; 1,2; 2,2; 2,3; 3,3; 3,4; 3,5; 4,4; 4,5; 4,6 Landscape: 1,1; 2,1; 2,2; 3,2; 3,3; 4,3; 5,3; 4,4; 5,4

The following formats are also supported with the exception that the value returned in the response message will be the STANDARD\C,R equivalent:

Format	Support
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ROW\R1,R2,R3 ¹	Supported parameters: Portrait: 1; 1,1; 2,2; 2,2,2; 3,3,3; 3,3,3,3; 3,3,3,3,3; 4,4,4,4; 4,4,4,4,4 Landscape: 1; 2; 2,2; 3,3; 3,3,3; 4,4,4; 5,5,5; 4,4,4,4; 5,5,5,5
COL\C1,C2,C3 ¹	Supported parameters: Portrait: 1; 2; 2,2; 3,3; 3,3,3; 4,4,4; 5,5,5; 4,4,4,4; 5,5,5,5 Landscape: 1; 1,1; 2,2; 2,2,2; 3,3,3; 3,3,3,3; 3,3,3,3,3; 4,4,4,4; 4,4,4,4,4

Note 1: If the SCU supplies a format of the Portrait orientation, e.g., 2,3, but specifies the orientation to be Landscape, the KODAK PACS Link 9410 Acquisition System will print the film in Portrait orientation.

If orientation is not given for the film box, the KODAK PACS Link 9410 Acquisition System will determine the film orientation based on the format specified. For example, the format 3,2 will result in images being printed in the Landscape fashion. If the format is valid in either Portrait or Landscape (e.g. 2,2) and orientation is not explicitly given, the KODAK PACS Link 9410 Acquisition System will use Portrait orientation.

Note 2: The PACS Link 9410 Acquisition System will return failure if the Film Orientation attribute is set to LANDSCAPE but the printer does not support rotation.

Configuration Information - allows access to modality-specific or KODAK-specific configuration information.

Configuration Text	Description
LUT = m,n	Perception LUT selection. This attribute allows SCU's to specify the KODAK LUT that best suits their images. M is the group name in a character string or 0, and n specifies a LUT within the group. If m=0 , uses 9410 default configuration.
CSxxx	Curve Shape xxx, where 000 <= xxx <= 015 is supported.

Implementation description for optional attributes supported is as follows:

Annotation Display Format Id - instructs the KODAK PACS Link 9410 Acquisition System to create annotation boxes and set the format of the annotation boxes. The currently loaded machine resident font will be used.. The following annotation formats are supported.

Annotation Display Format Id	Format
LABEL	Prints a text string at the top of the film as a label. One Annotation Box is created. The Annotation Position for this box must be 0.
BOTTOM	Prints a text string at the bottom of each image. The number of Annotation Boxes created will be equal to the number of images supported by the Image Display Format. The Annotation Position for each annotation string should be the same as the corresponding Image Position.
COMBINED	Combines the above two annotation formats: Prints a text string at the bottom of each image (with Annotation Position matching the corresponding Image Position), and a label at the top of the film (its Annotation Position = 0). The number of Annotation Boxes created will be one greater than the number of images supported by the Image Display Format.
NONE	No text string is printed at the top of the film or at the bottom of each image.

Smoothing Type - If Magnification Type is CUBIC, this attribute allows the SCU to specify the various smoothing effects provided by the interpolation algorithm in the KODAK Laser Imager. 0 specifies replicate (or auto for laser model 8600, 8610), and 1 through 15 specifies various levels of smoothing. Please note that levels of smoothing is laser specific.

Border Density - allows the density of the areas surrounding and between images on the film to be either dark or white.

Trim - specifies whether a trim box be printed around each image on film. The trim density is the opposite of the border density.

The behavior of all specific DIMSE Service status codes are as follows:

N-CREATE:

Code	Status	Meaning
0000	Success	Film box is successfully created. Some attributes may have different values than what was requested. The actual values of attributes are returned. <i>Note that any existing film box will become inaccessible when a new film box is successfully created. Failure will be returned to the SCU if the SCU attempts to access (set image, erase image, delete, print) the previous film box.</i>
0116	Warning	Attribute out of range. With the exception of the referenced Film Session sequence, the referenced Image Box sequence and the possible referenced Annotation Box sequence, the attribute in question will be the only attribute returned in the responses data set.
0106	Failure	Invalid attribute value. A data set is returned with all invalid attributes/values.
0110	Failure	Processing failure: cannot decode the DIMSE attribute.
0111	Failure	Duplicate SOP instance: instance UID given is already in use.
0117	Failure	Invalid object instance: instance UID given had incorrect syntax.
0120	Failure	Missing attribute: mandatory attributes are missing. A list of missing mandatory attribute tags is returned in the Attribute Identifier List (0000,1005).
0121	Failure	Missing attribute value: a mandatory attribute was given, but had no value. A data set is returned of all attributes/values missing.
0213	Failure	Resource limitation: film box cannot be opened.

N-SET:

Code	Status	Meaning
0000	Success	Some attributes may have different values than what was requested. The actual values of attributes are returned.
0107	Warning	Attributes not recognized within the context of this SOP class. For example, an N_Set on the Image Display format attribute was attempted. A list of offending attribute tags is returned in Attribute List (0000,1005). A data set is still returned with valid attributes/values.
0116	Warning	Attribute out of range. The attribute in question is the only attribute returned in the responses data set.
0106	Failure	Invalid attribute value. A data set is returned of all invalid attributes/values.
0110	Failure	Processing failure: cannot decode the DIMSE attribute.
0112	Failure	No such object instance: the instance UID given does not exist.
0121	Failure	Missing attribute value: a mandatory attribute was given, but had no value. A data set is returned of all attributes/values missing.

N-DELETE:

Code	Status	Meaning
0000	Success	Film box has been successfully deleted.
0112	Failure	No such object instance: the instance UID given does not exist.

N-ACTION:

Code	Status	Meaning
0000	Success	Film accepted for printing. Print Job SOP instance is created, and the instance UID is returned.
B603	Warning	Film Box SOP instance hierarchy does not contain Image Box SOP instances (empty page). Empty page will not be printed.
0112	Failure	No such object instance: the instance UID given does not exist.
0211	Failure	Unrecognized operation: the action ID type is not supported (i.e., not PRINT).
C602	Failure	Unable to create Print Job SOP instance; print queue is full.

3.1.7.1.3.2.3 Basic Grayscale Image Box SOP Class

The KODAK PACS Link 9410 Acquisition System provides the following support for the attributes contained in the N-SET DIMSE Service of the Basic Grayscale Image Box SOP Class:

Attribute	Tag	Valid Range	Default Value if not sent by SCU	Response to Invalid Value
Image Position	(2020,0010)	1 - Max number of images for Display Format	Mandatory, no default.	Failure (0x0106)
Preformatted Grayscale Sequence	(2020,0110)	N/A	N/A	N/A
>Samples Per Pixel	(0028,0002)	1	Mandatory, no default.	Failure (0x0106)
>Photometric Interpretation	(0028,0004)	MONOCHROME1 MONOCHROME2	Mandatory, no default.	Failure (0x0106)
>Rows ^{1,2}	(0028,0010)	1 - Maximum rows for film size	Mandatory, no default.	Failure (0x0106) or (0xC603)

>Columns ^{1,2}	(0028,0011)	1 - Maximum columns for film size.	Mandatory, no default.	Failure (0x0106) or (0xC603)
>Pixel Aspect Ratio ³	(0028,0034)	Any pair of valid positive integers (1 to 2 ¹⁵ -1)	1:1	Warning (0x116)
>Bits Allocated	(0028,0100)	8 or 16	Mandatory, no default.	Failure (0x0106)
>Bits Stored	(0028,0101)	8 - 16	Mandatory, no default.	Failure (0x0106)
>High Bit	(0028,0102)	7-15	Mandatory, no default.	Failure (0x0106)
>Pixel Representation	(0028,0103)	0 = unsigned 1 = 2's Complement	Mandatory, no default.	Failure (0x0106)
Polarity	(2020,0020)	NORMAL REVERSE	NORMAL	Failure (0x0106)
Magnification Type ³	(2010,0060)	REPLICATE BILINEAR CUBIC NONE	Configurable	Warning (0x116)
Smoothing Type	(2010,0080)	0-15, the value is laser specific.	Configurable	Warning (0x116)
Configuration Information	(2010,0150)	LUT = m,n m = a character string or 0, n = 0-15, the value is laser specific. CSxxx 000 ≤ xxx ≤ 015	m = a character string or 0, n is configurable.	Warning (0x116)
Requested Image Size ³	(2020,0030)	Up to the maximum row size for film size.	Not set	Warning (0x116)
Reference Presentation LUT Sequence	(2050,0500)	N/A	N/A	N/A

>Referenced SOP Class UID	(0008,1150)	SOP Class UID	Mandatory if sequence is present, no default	Failure (0x0106)
>Referenced SOP Instance UID	(0008,1155)	SOP Instance UID	Mandatory if sequence is present, no default	Failure (0x0106)

Note 1: Refer to Appendix A for a summary of how these attributes are supported for specific KODAK Laser Imager models. Rows and columns greater than what the film size allows may result in demagnification of the images.

Note 2: It is recommended that all images within a film box be of the same size. Provisions do exist, however, for varying image sizes on some KODAK Laser Imagers, but with certain restrictions. We require testing of any application intending to vary image sizes prior to field installation.

Note 3: The KODAK PACS Link 9410 Acquisition System considers the Requested Image Size, Magnification Type of NONE and Aspect Ratio to determine a magnification factor for interpolating the image on the film. The resultant magnification factor that the KODAK PACS Link 9410 Acquisition System applies to an image is based on the following hierarchy:

1. **Requested Image Size** - If the Requested Image Size is set by the SCU, the X dimension is equal to the value specified by the Requested Image Size in mm, and the Y dimension is calculated based on the X dimension and the Aspect Ratio. A magnification type of NONE will be ignored and the laser using a smoothing factor provided by customer or configured by 9410 will interpolate the image.
2. **Magnification Type of NONE** - If the Magnification Type is set to NONE and Requested Image Size is not sent by the SCU, the X dimension is set to the number of pixels in the image's row, and the Y dimension is calculated based on the X dimension and the Aspect Ratio. The laser will interpolate the image, if necessary, using a smoothing factor.

The KODAK PACS Link 9410 Acquisition System provides support for the optional attributes:

Magnification Type - Same as the attribute Magnification Type in Film Box, but used here for image based setting. If not specified, the value of this attribute inherits from Magnification Type in Film Box.

Smoothing Type - If Magnification Type was cubic, this attribute allows the Laser Imager interpolation algorithm to be further defined.

Configuration Information - allows access to modality-specific or KODAK-specific configuration information.

Configuration Text	Description
LUT = m,n	Perception LUT selection. This attribute allows SCU's to specify the KODAK LUT that best suits their images. m is the group name in a character string or 0, and n specifies a LUT within the group. If m=0 , uses 9410 default configuration.
CSxxx	Curve Shape xxx, where 000 <= xxx <= 015 is supported.

The behavior of all specific DIMSE Service status codes are as follows:

N-SET:

Code	Status	Meaning
0000	Success	Some attributes may have different values than what was requested. The actual values of attributes are returned.
0116	Warning	Attribute out of range. The attribute in question is the only attribute returned in the responses data set.
0106	Failure	Invalid attribute value: a data set is returned with all invalid attributes/values.
0110	Failure	Processing failure: cannot decode the DIMSE attribute.
0112	Failure	No such object instance: the instance UID given does not exist.
0120	Failure	Missing attribute: mandatory attributes are missing. A list of missing mandatory attribute tags is returned.
0121	Failure	Missing attribute value: a mandatory attribute was given, but had no value. A data set is returned of all attributes/values missing.
C603	Failure	Image size exceeds Image Box dimensions.
C605	Failure	Insufficient memory or disk space to store the image.

3.1.7.1.3.2.4 SOP Specific Conformance to Printer SOP Class

The KODAK PACS Link 9410 Acquisition System will allow the following printer attributes to be retrieved via the N-GET DIMSE Service of the Printer SOP Class.

Printer attributes that can be updated by the N-GET	
Attribute Name	Tag
Printer Name	(2110,0030)
Manufacturer	(0008,0070)
Manufacturer Model Name	(0008,1090)
Software Versions	(0018,1200)

The KODAK PACS Link 9410 Acquisition System sends the following printer status attributes to the requesting SCU using the N-GET DIMSE Service of the Printer SOP Class;

Attribute	Tag	Valid Range
Printer Status	(2110,0010)	NORMAL WARNING*** FAILURE

Printer Status Info	(2110,0020)	<p>If FAILURE:</p> <ul style="list-style-type: none"> - ELEC CONFIG ERR - ELEC SW ERROR - PRINTER DOWN - UNKNOWN <p>If WARNING**:</p> <ul style="list-style-type: none"> - PROC INIT - PROC DOWN - PRINTER INIT - CALIBRATION ERR - PROC OVERFLOW FL - CHEMICALS EMPTY - CHECK CHEMISTRY - PROC OVERFLOW HI - CHEMICALS LOW - BAD SUPPLY MGZ - NO SUPPLY MGZ - SUPPLY MGZ ERR - SUPPLY EMPTY - SUPPLY LOW - RECEIVER FULL - NO RECEIVE MGZ - CALIBRATION ERR - COVER OPEN - FILM JAM
Printer Name	(2110,0030)	"IMN_LaserImager"
Manufacturer	(0008,0070)	KODAK
Manufacturer Model Name	(0008,1090)	M959, M969, M8700, etc.
Software Versions	(0018,1020)	XXX
Sheets Left	(1001,1000)	string of numerical digits 0-9

The PACS Link 9410 Acquisition System reserves private attribute values (1001,1000-10FF). At this time only one private tag is used. The private attribute, Sheets Left, will be returned in response to the Printer SOP Class N_GET DIMSE Service.

The following status codes may be returned in response to N-GET:

Code	Status	Meaning
0000	Success	request is successful; printer information is returned.
0107	Warning	Attributes not recognized within the context of this SOP class. For example, unsupported attributes were requested. A list of offending attribute tags is returned in Attribute List (0000,1005). A data set is still returned with valid attributes/values.

The KODAK PACS Link 9410 Acquisition System can be configured to send the printer status information using the N-EVENT-REPORT DIMSE Service, asynchronously to all associated SCU's that support the Printer SOP class. When the status is NORMAL, no attribute is sent. When the status is either WARNING or FAILURE, the following attributes are sent:

Attribute	Tag	Valid Range
Printer Name	(2110,0030)	"IMN_LaserImager"

Printer Status Info	(2110,0020)	<p>If FAILURE:</p> <ul style="list-style-type: none"> - ELEC CONFIG ERR - ELEC SW ERROR - PRINTER DOWN - UNKNOWN <p>If WARNING**:</p> <ul style="list-style-type: none"> - PROC INIT - PROC DOWN - PRINTER INIT - CALIBRATION ERR - PROC OVERFLOW FL - CHEMICALS EMPTY - CHECK CHEMISTRY - PROC OVERFLOW HI - CHEMICALS LOW - BAD SUPPLY MGZ - NO SUPPLY MGZ - SUPPLY MGZ ERR - SUPPLY EMPTY - SUPPLY LOW - RECEIVER FULL - NO RECEIVE MGZ - CALIBRATION ERR - COVER OPEN - FILM JAM
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Notes:

If the SCU does not like WARNING as Printer Status (Konica modality for instance), KODAK PACS Link 9410 provides a way to disable that. When WARNING as Printer Status is disabled, every keyword WARNING marked with *** within this whole section(3.1.7.1.3.2.4 *SOP Specific Conformance to Printer SOP Class*) should be removed; and every keyword WARNING marked with ** should be replaced with keyword NORMAL. Which means:

1. For N-GET, the SCU only get FAILURE or NORMAL as Printer Status. In case of FAILURE, the Printer Status Info contains PRINTER DOWN or UNKNOWN etc. and in case of NORMAL, the Printer Status Info contains SUPPLY LOW or COVER OPEN etc.

2. For N-EVENT-REPORT, the SCU gets notified with NORMAL or FAILURE (excluding WARNING) whenever the printer status changes.

After KODAK PACS Link 9410 gets installed initially, the WARNING as Printer Status is ENABLED. The following is how to DISABLE/ENABLE the WARNING as Printer Status:

1. To DISABLE the WARNING as Printer Status, double click “DisablePrinterStatusWarning.reg”
2. To ENABLE the WARNING as Printer Status, double click “EnablePrinterStatusWarning.reg”

Both files can be found under the BIN directory of KODAK PACS Link 9410

3.1.7.1.3.3 SOP Specific Conformance to Basic Annotation Box SOP Class

The KODAK PACS Link 9410 Acquisition System provides the following support for the attributes contained in the N-SET DIMSE Service of the Basic Annotation Box SOP Class:

Attribute	Tag	Valid Range	Default Value if not sent by SCU	Response to Invalid Value
Annotation Position	(2030,0010)	0 - Max number of annotation strings defined for Annotation Format	Mandatory, no default.	Failure (0x0106)
Text String	(2030,0020)	1-64 characters	Null string	Warning (0x116)

The behavior of all specific DIMSE Service status codes are as follows:

N-SET:

Code	Status	Meaning
0000	Success	Some optional attributes may have different values than what was requested. The actual values of attributes are returned.
0116	Warning	Attribute out of range. The attribute in question is the only attribute returned in the responses data set.
0106	Failure	Invalid attribute value: a data set is returned of all invalid attributes/values.
0110	Failure	Processing failure: cannot decode the DIMSE attribute.
0112	Failure	No such object instance: the instance UID given does not exist.
0120	Failure	Missing attribute: mandatory attributes are missing. A list of missing mandatory attribute tags is returned.
0121	Failure	Missing attribute value: a mandatory attribute was given, but had no value. A data set is returned of all attributes/values missing.

3.1.7.1.3.4 SOP Specific Conformance to Print Job SOP Class

If an SCU needs to monitor the status of a print job, it can either maintain its association until the KODAK PACS Link 9410 Acquisition System notifies the SCU that the print job has completed, or it may open a new association with the KODAK PACS Link 9410 Acquisition System to track the print job using the Print Job SOP Class.

The KODAK PACS Link 9410 Acquisition System responds to a N-GET DIMSE Service request and returns the following attributes in support of Print Job SOP Class.

Attribute	Tag	Valid Range
Execution Status	(2100,0020)	PENDING PRINTING DONE FAILURE

<p>Execution Status Info</p>	<p>(2100,0030)</p>	<p>If PRINTING or DONE:</p> <ul style="list-style-type: none"> - NORMAL <p>If PENDING:</p> <ul style="list-style-type: none"> - QUEUED - PROC INIT - PROC DOWN - PRINTER INIT - CALIBRATION ERR - PROC OVERFLOW FL - CHEMICALS EMPTY - CHECK CHEMISTRY - PROC OVERFLOW HI - CHEMICALS LOW - BAD SUPPLY MGZ - NO SUPPLY MGZ - SUPPLY MGZ ERR - SUPPLY EMPTY - SUPPLY LOW - RECEIVER FULL - NO RECEIVE MGZ - CALIBRATION ERR - COVER OPEN - FILM JAM <p>If FAILURE:</p> <ul style="list-style-type: none"> - JOB CANCELED - INVALID PAGE DES - ELEC SW ERROR - UNKNOWN
<p>Print Priority</p>	<p>(2000,0020)</p>	<p>HIGH MED LOW</p>

Creation Date	(2100,0040)	Date of print job creation
Creation Time	(2100,0050)	Time of print job creation
Printer Name	(2110,0030)	"IMN_LaserImager"
Originator	(2100,0070)	SCU AE title that issued the print operation

The KODAK 9410 supports the following optional attributes of the N-GET DIMSE Service of the Print Job SOP Class.

Optional attributes that can be updated by N-GET	
Attribute Name	Tag
Creation Date	(2100,0040)
Creation Time	(2100,0050)
Printer Name	(2100,0030)
Originator	(2100,0070)

The following status codes may be returned in response to the N-GET:

Code	Status	Meaning
0000	Success	request is successful; printer information is returned.
0107	Warning	Attributes not recognized within the context of this SOP class. A list of offending attribute tags is returned in Attribute List (0000,1005). A data set is still returned with valid attributes/values.
0112	Failure	No such object instance: the instance UID given does not exist.

The KODAK PACS Link 9410 Acquisition System can be configured to report the status of the print job using the N-EVENT_REPORT DIMSE Service, asynchronously to the associated SCU which created the job and establishes the association to support the Print Job SOP Class. For each status PENDING, PRINTING, DONE and FAILURE, the following print job attributes are returned to the SCU:

Print Job attributes returned in N-EVENT-REPORT	
Attribute Name	Tag
Printer Name	(2110,0030)

Film Session Label	(2000,0060)
Execution Status Info	(2100,0030)

3.1.7.1.3.5 SOP Specific Conformance to Presentation LUT SOP Class

The KODAK PACS Link 9410 Acquisition System supports the Presentation LUT SOP class as SCP. Print SCU may negotiate this support and create a Presentation LUT instance prior to the creation of Basic Film Session. Multiple Presentation LUT instances are supported. The Referenced Presentation LUT Sequence can then be sent by SCU to reference a specific instance on Film Box or Image Box level.

The KODAK PACS Link 9410 Acquisition System responds to N-CREATE, N-DELETE DIMSE Service request and returns SUCCESS status in support of Presentation LUT SOP Class.

The KODAK PACS Link 9410 Acquisition System supports the following attributes of the N-CREATE DIMSE Service of the Presentation LUT SOP Class.

Presentation LUT attributes supported in N-CREATE	
Attribute Name	Tag
Presentation LUT Sequence	(2050,0010)
>LUT Descriptor	(0028,3002)
>LUT Explanation	(0028,3003)
>LUT Data	(0028,3006)
Presentation LUT Shape	(2050,0020)

When a N-DELETE DIMSE service is requested with a specific Presentation LUT SOP instance, the KODAK PACS Link 9410 Acquisition System shall not delete the specified Presentation LUT SOP instance as long as there are outstanding references to it. Otherwise, it deletes the specified Presentation LUT SOP instance.

Note: All image pixel values less than the first entry in the LUT data are mapped to the first entry in the LUT Data. An image pixel value one greater than the first entry is mapped to the second entry in the LUT Data. Subsequent image pixel values are mapped to the subsequent entries in the LUT Data up to an image pixel value equal to number of entries + first entry – 1 which is mapped to the last entry in the LUT Data. All image pixel values greater than the last entry are mapped to the last entry in the LUT Data.

3.1.7.1.4 Presentation Context Acceptance Criterion

The KODAK PACS Link 9410 Acquisition System accepts any combination of the SOP Classes listed above. At the time of association establishment, the KODAK PACS Link 9410 Acquisition System returns a list of presentation contexts specified by the SCU, that will be supported. The KODAK PACS Link 9410 Acquisition System does not support extended negotiation.

3.1.7.1.5 Transfer Syntax Selection Policies

During the negotiation phase of association establishment, if more than one transfer syntax is proposed in a presentation context, the KODAK PACS Link 9410 Acquisition System will accept the first proposed syntax that matches a supported syntax listed in Section 3.1.3.1.2.

4. COMMUNICATION PROFILES

The KODAK PACS Link 9410 Acquisition System provides the DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

The KODAK PACS Link 9410 Acquisition System utilizes the TCP/IP stack from the NT system from which it executes.

5. EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

5.1 Extensions

The following extensions to DICOM attributes are supported by the KODAK PACS Link 9410 Acquisition System:

SOP Class: Basic Film Session SOP

Attribute: Film Destination (2000,0040)

Extensions: CURRENT

This extension allows the SCU to print on the destination currently configured at the printer.

SOP Class: Basic Film Session SOP

Attribute: Medium Type (2000, 0030)

Extensions: CURRENT

This extension allows images to be printed on whatever media type is currently loaded in the printer.

Note that if Medium Type is specified, and a media type other than that requested is installed, the KODAK PACS Link 9410 Acquisition System will return success (0x0) , and will either queue the print job until the correct media type is installed, or print on the media currently installed, based on the KODAK PACS Link 9410 Acquisition System configuration. Specifying the Media Type to CURRENT will ensure that the print job will always be printed.

If Medium Type is not specified, the default CURRENT will be used, allowing images to always be printed.

SOP Class: Basic Film Box SOP

Attribute: Film Size (2010, 0050)

Extensions: CURRENT

This extension allows images to be printed on whatever film size is currently loaded in the printer.

Note that if Film Size is specified, and a size other than that requested is installed, the KODAK PACS Link 9410 Acquisition System will return success (0x0), and will either queue the print job until the correct sized film is installed or print on the media currently installed, based on the KODAK PACS Link 9410 Acquisition System configuration. Specifying the Film Size to CURRENT will ensure that the print job will always be printed.

If Film Size is not specified, the default CURRENT will be used, allowing images to always be printed.

SOP Class: Basic Greyscale Image Box SOP

Attribute: Bits Stored (0028, 0101)

Extensions: 8-16 bits stored are supported.

DICOM only specifies 8 and 12 for number of bits stored. The KODAK PACS Link 9410 Acquisition System supports the number of bits stored to be from 8 through 16 bits.

SOP Class: Basic Greyscale Image Box SOP

Attribute: High Bit (0028, 0102)

Extensions: High Bit positions 7 - 15 are supported.

DICOM specifies that the high bit must be the 7th or 11th bit (for 8 or 12 bits stored, respectively). The KODAK PACS Link 9410 Acquisition System supports the high bit to be the number of bits stored minus one. For example, if the number of bits stored is 13, the high bit is 12.

SOP Class: Printer SOP, Print Job SOP

Attribute: Printer Status Info, Execution Status Info

Extensions: A number of KODAK defined character strings

Additional character strings describing the status of a printer are supported by the KODAK PACS Link 9410 Acquisition System. This extension will provide the SCU or the end user with more details about the status of a printer when abnormal conditions occur.

5.2 Specialization - Contrast Test Mode

To establish the best density and contrast settings to use, a contrast test on the printer should be performed.

The DICOM Print Management protocol provides the support needed for an SCU to implement a contrast test on their own by building several film boxes, each with a unique printer LUT selected.

Future revisions of the KODAK PACS Link 9410 Acquisition System will support Contrast Test in a TBD more direct fashion.

6. CONFIGURATION

6.1 AE Title/Presentation Address Mapping

The host name and IP address of the KODAK PACS Link 9410 Acquisition System can be configured on the SCU at installation time.

The TCP port number used by the KODAK PACS Link 9410 Acquisition System is configurable and the default is 1024.

The AE title is configurable and the default is "9410".

6.2 Configurable Parameters

The following parameters can be configured at the KODAK PACS Link 9410 Acquisition System on a per-DISOL instance basis.

Configuration parameters:

- AE Title

- TCP port
- Maximum number of simultaneous associations
- N_EVENT_REPORTING (On/Off for either Printer, PrintJob or both).
- Warning Returns (On/Off)
- Handling of print jobs when requested Media Type and/or Film Size are not currently installed. The options are:
 1. Queue the print job until the film matching the requested Media Type and/or Film Size is loaded.
 2. Print on the film currently loaded in the printer.
- KODAK PACS Link 9410 Acquisition System default values for:
 - * Maximum density
 - * Border density
 - * Magnification type
 - * Smoothing factor
 - * Contrast Lookup Table (LUT).
 - * Number of Copies
 - * Polarity
 - * Orientation
 - * Requested Image Size
 - * Trim (ON/OFF)
 - * Priority
 - * Contrast Test Mode (operation set to ON or OFF)
 - * Contrast Test Density (if zero, use Film Box density).

Appendix A**A.1 Capabilities Specific to KODAK Laser Imagers**

Model	Imager Type (database entry for film size)	Support Rotation	Image Frame Supported	Support Border	Support Polarity
1	831 (E14x17=2)	TRUE	FALSE	TRUE	TRUE
2	952 (E14x17=2)	FALSE	FALSE	TRUE	TRUE
3	959 (E14x17=2)	FALSE	TRUE	TRUE	TRUE
4	969 (E8x10=8,E11x14=4, E14x17=2)	TRUE	TRUE	TRUE	TRUE
5	8100 (E14x17=2)	FALSE	FALSE	FALSE	TRUE
6	8300 (E10x8=8)	TRUE	FALSE	FALSE	TRUE
7	8700 (E14x17=2)	FALSE	TRUE	FALSE	TRUE
8	8700 Dual 8800/8700 (E14x17=2)	TRUE	TRUE	FALSE	TRUE
9	8300 Dual 8800/8300 (E10x8=8)	TRUE	FALSE	FALSE	TRUE
10	8500 (E14x11=4)	FALSE	TRUE	FALSE	TRUE
11	8600/8610 (E10x8=8)	TRUE	FALSE	FALSE	TRUE
12	969 Dual 8800/969 (E8x10=8,E11x14=4, E14x17=2)	TRUE	TRUE	TRUE	TRUE
13	8500 Dual 8800/8500 (E14x11=4)	TRUE	TRUE	FALSE	TRUE
14	969 HQT (E14x17=2)	FALSE	TRUE	TRUE	TRUE

Model	Imager Type (database entry for film size)	Max DMax	Min DMax	SupportsContrastTest	SupportsDensityTest
1	831 (E14x17=2)	320	170	TRUE	FALSE
2	952 (E14x17=2)	320	170	TRUE	TRUE
3	959 (E14x17=2)	320	170	TRUE	TRUE
4	969 (E8x10=8, E11x14=4, E14x17=2)	320	170	TRUE	TRUE
5	8100 (E14x17=2)	310	170	FALSE	TRUE
6	8300 (E10x8=8)	300	150	TRUE	FALSE
7	8700 (E14x17=2)	310	170	TRUE	TRUE
8	8700 Dual 8800/8700 (E14x17=2)	310	170	TRUE	TRUE
9	8300 Dual 8800/8300 (E10x8=8)	300	150	FALSE if through 9410. TRUE if through local panel.	TRUE
10	8500 (E14x11=4)	310	170	FALSE	TRUE
11	8600/8610 (E10x8=8)	350	200	FALSE if through 9410. TRUE if through local panel.	TRUE
12	969 Dual 8800/969 (E8x10=8, E11x14=4, E14x17=2)	320	170	TRUE	TRUE
13	8500 Dual 8800/8500 (E14x11=4)	310	170	FALSE	TRUE
14	969 HQT (E14x17=2)	320	170	TRUE	TRUE

Model	Imager Type (database entry for film size)	Max Copies	Support Border Density	Support Empty Image Density	DPI	Supported Destination
1	831 (E14x17=2)	99	FALSE	FALSE	300	MAGAZINE, PROCESSOR
2	952 (E14x17=2)	99	TRUE	FALSE	300	MAGAZINE, PROCESSOR
3	959 (E14x17=2)	99	TRUE	FALSE	300	MAGAZINE, PROCESSOR
4	969 (E8x10=8, E11x14=4, E14x17=2)	99	TRUE	FALSE	311.5	MAGAZINE, PROCESSOR
5	8100 (E14x17=2)	99	FALSE	FALSE	325.1	PROCESSOR
6	8300 (E10x8=8)	99	FALSE	FALSE	300	PROCESSOR
7	8700 (E14x17=2)	99	FALSE	FALSE	325.1	PROCESSOR
8	8700 Dual 8800/8700 (E14x17=2)	99	FALSE	FALSE	325.1	PROCESSOR
9	8300 Dual 8800/8300 (E10x8=8)	99	FALSE	FALSE	300	PROCESSOR
10	8500 (E14x11=4)	99	FALSE	FALSE	325.1	PROCESSOR
11	8600/8610 (E10x8=8)	99	FALSE	FALSE	655.484	PROCESSOR
12	969 Dual 8800/969 (E8x10=8, E11x14=4, E14x17=2)	99	FALSE	FALSE	311.5	MAGAZINE, PROCESSOR
13	8500 Dual 8800/8500 (E14x11=4)	99	FALSE	FALSE	325.1	PROCESSOR
14	969 HQT (E14x17=2)	99	FALSE	FALSE	325.1	MAGAZINE, PROCESSOR

A.2 Capabilities Specific to KODAK Film Types.

Model	Imager Type (database entry for film size)	Page Formats	Orientations
1	831 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5	PORTRAIT
2	952 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5	PORTRAIT
3	959 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5	PORTRAIT
4	969 (E11x14=4)	1x1, 1x2, 2x2, 2x3, 3x3, 3X4, 3X5	PORTRAIT, LANDSCAPE
4	969 (E8x10=8)	1x1, 1x2, 2x2, 2x3	PORTRAIT, LANDSCAPE
4	969 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5	PORTRAIT, LANDSCAPE
5	8100 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5, 4X6	PORTRAIT, LANDSCAPE
6	8300 (E8x10=8)	1x1, 1x2, 2x2, 2x3	PORTRAIT, LANDSCAPE
7	8700 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5, 4X6	PORTRAIT
8	8700 Dual - 8800/8700 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5	PORTRAIT, LANDSCAPE
9	8300 Dual - 8800/8300 (E8x10=8)	1x1, 1x2, 2x2, 2x3	PORTRAIT, LANDSCAPE
10	8500 (E14x11=4)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4	PORTRAIT
11	8600/8610 (E8x10=8)	1x1, 1x2, 2x2, 2x3	PORTRAIT, LANDSCAPE
12	969 Dual - 8800/969 (E8x10=8)	1x1, 1x2, 2x2, 2x3	PORTRAIT, LANDSCAPE
12	969 Dual - 8800/969 E11x14=4)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5	PORTRAIT, LANDSCAPE
12	969 Dual - 8800/969 (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5	PORTRAIT, LANDSCAPE
13	8500 Dual - 8800/8500 (E14x11=4)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4	PORTRAIT, LANDSCAPE
14	969 HQT (E14x17=2)	1x1, 1x2, 2x2, 2x3, 3x3, 3x4, 3x5, 4x4, 4x5	PORTRAIT

Model	Imager Type (database entry for film size)	Film Types	Support Slides	Rotation
1	831 (E14x17=2)	BLUE	FALSE	YES
2	952 (E14x17=2)	BLUE, CLEAR	FALSE	NO
3	959 (E14x17=2)	BLUE, CLEAR	FALSE	NO
4	969 (E8x10=8)	BLUE, CLEAR	TRUE	YES
4	969 (E11x14=4)	BLUE, CLEAR	TRUE	YES
4	969 (E14x17=2)	BLUE, CLEAR	TRUE	YES
5	8100 (E14x17=2)	BLUE, CLEAR	FLASE	YES
6	8300 (E8x10=8)	BLUE, CLEAR	FALSE	YES
7	8700 (E14x17=2)	BLUE, CLEAR	FALSE	NO
8	8700 Dual - 8800/8700 (E14x17=2)	BLUE, CLEAR	FALSE	YES
9	8300 Dual - 8800/8300 (E8x10=8)	BLUE, CLEAR	FALSE	NO
10	8500 (E14x11=4)	BLUE, CLEAR	FALSE	NO
11	8600/8610 (E8x10=8)	BLUE	FALSE	YES
12	969 Dual - 8800/969 (E8x10=8)	BLUE, CLEAR	TRUE	YES
12	969 Dual - 8800/969 E11x14=4)	BLUE, CLEAR	TRUE	YES
12	969 Dual - 8800/969 (E14x17=2)	BLUE, CLEAR	TRUE	YES
13	8500 Dual - 8800/8500 (E14x11=4)	BLUE, CLEAR	FALSE	YES
14	969 HQT (E14x17=2)	BLUE, CLEAR	FALSE	NO

Model	Imager Type (database entry for film size)	Min Magnification	Max Magnification	Max Pixels Per Row	Max Pixels Per Column
1	831 (E14x17=2)	1	64	3945	4800
2	952 (E14x17=2)	1	64	3945	4800
3	959 (E14x17=2)	0.51	64	3944	4800
4	969 (E8x10=8)	0.26	64	2086	2929
4	969 (E11x14=4)	0.26	64	3030	4096
4	969 (E14x17=2)	0.26	64	4096	5002
5	8100 (E14x17=2)	1	64	4096	5223
6	8300 (E8x10=8)	1	16	2256	2676
7	8700 (E14x17=2)	1	64	4096	5223
8	8700 Dual - 8800/8700 (E14x17=2)	0.26	64	4096	5223
9	8300 Dual - 8800/8300 (E8x10=8)	0.26	64	2256	2576
10	8500 (E14x11=4)	1	64	3388	4283
11	8600/8610 (E8x10=8)	0.26	16	5025	6200
12	969 Dual - 8800/969 (E8x10=8)	0.26	64	2086	2814
12	969 Dual - 8800/969 E11x14=4)	0.26	64	3030	3936
12	969 Dual - 8800/969 (E14x17=2)	0.26	64	4096	5002
13	8500 Dual - 8800/8500 (E14x11=4)	0.26	64	3388	4283
14	969 HQT (E14x17=2)	1	64	4096	5002

Model	Imager Type (database entry for film size)	Supported Annotation Formats	Film Feeding Orientation
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1	831 (E14x17=2)	NONE	PORTRAIT
2	952 (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
3	959 (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
4	969 (E8x10=8)	LABEL, BOTTOM, COMBINED, NONE	LANDSCAPE
4	969 (E11x14=4)	LABEL, BOTTOM, COMBINED, NONE	LANDSCAPE
4	969 (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
5	8100 (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
6	8300 (E8x10=8)	NONE	PORTRAIT
7	8700 (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
8	8700 Dual - 8800/8700 (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
9	8300 Dual - 8800/8300 (E8x10=8)	NONE	PORTRAIT
10	8500 (E14x11=4)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
11	8600/8610 (E8x10=8)	NONE. A special case COMBINED for 1up is used by Fisher Imaging.	PORTRAIT
12	969 Dual - 8800/969 (E8x10=8)	LABEL, BOTTOM, COMBINED, NONE	LANDSCAPE
12	969 Dual - 8800/969 E11x14=4)	LABEL, BOTTOM, COMBINED, NONE	LANDSCAPE
12	969 Dual - 8800/969 (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
13	8500 Dual - 8800/8500 (E14x11=4)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT
14	969 HQT (E14x17=2)	LABEL, BOTTOM, COMBINED, NONE	PORTRAIT

Appendix B

B.2 Limitations

1. Release 1.0 of the 9410 PACS Link Acquisition System is not able to process an A-ABORT when received during an N_SET Basic Image Box operation.
2. Release 1.0 of the 9410 PACS Link Acquisition System does not support configuration on a per-Service Class User (SCU) basis. Release 1.1 does support per SCU configuration.
3. Release 1.0 of the 9410 PACS Link Acquisition System does not support the ability to configure N-Event-Report DIMSE Service Class processing via the SMT service tool. N-Event-Report DIMSE Service Class processing can only be setup using the database tools. N-Event-Report DIMSE Service Class processing is also not configurable on a per-SCU basis. Release 1.1 SMT supports the above configuration.