



Kodak DryView 8150 Systems

DICOM Conformance Statement

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Revision History

Date	Rev	MIM S/W	Editor	Comments
06 Jan 2004	A	5.7	Kojun T. Hatta	Initial Version.
25 Jul 2004	1.0	5.7	Kojun T. Hatta	Updates based on document review: Annex D: Adjust column 1 paragraph spacing. Annex D, Landscape Size Info: Correct Max Image Width for 14x14 film. Annex E: Change Smoothing Type to ZERO for Magnification Type of NONE, based on testing at Siemens. Changed Rev B to Rev 1.0 to conform with Domino.doc numbering scheme.
19 Oct 2004	1.1	5.7	Kojun T. Hatta	Section 0.6: Add reference Part 5 of DICOM Standard. Section 2.2.2: Add note explicitly stating that Big Endian Transfer Syntaxes are not supported.

0. Introduction

0.1. Executive Overview

This document covers the *Kodak DryView 8150 Laser Imager* product.

The following DICOM SOP Classes are supported:

SOP Class Name	SOP Class UID	Service Class Role
Verification SOP Class	1.2.840.10008.1.1	SCU, SCP
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	SCP
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	SCP
Basic Annotation Box SOP Class	1.2.840.10008.5.1.1.15	SCP
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	SCP

0.2. Scope and Field of Application

This document describes the DICOM functionality of the DryView 8150 Laser Imager. The DryView 8150 Laser Imager acts as a DICOM Service Class Provider (SCP). The DryView 8150 Laser Imager performs transactions over a TCP/IP network via the DICOM messages exchange protocol. The DryView 8150 Laser Imager uses *Kodak PACS Link Medical Image Manager* software to capture and print images and data.

0.3. Important Considerations for the Reader

This DICOM Conformance Statement by itself is not sufficient to guarantee successful connectivity between the DryView 8150 Laser Imager and equipment from other vendors. The following points should be taken into consideration:

- The integration of equipment from different vendors (including Kodak) goes beyond the scope of the DICOM 3.0 standard and the DICOM Conformance Statements from Kodak and other vendors. It is the responsibility of the user (or user's agent) to assess the application requirements and to design a solution that integrates Kodak equipment with equipment from other vendors.
- When the comparison of this DICOM Conformance Statement with a DICOM Conformance Statement from another vendor indicates that connectivity should be possible, it is the responsibility of the user (or user's agent) to verify this by carrying out validation tests and to check whether all required functionality (such as cut lines) is met.
- Eastman Kodak Company reserves the right to make changes to the DryView 8150 Laser Imager architecture described in this document. The user (or user's agent) should ensure that any equipment connected via DICOM to Kodak equipment also follows the future evolution of the DICOM 3.0 standard. Failure to do so may result in (partial) loss of connectivity.
- For all DICOM attributes of type M (shown in the column of SCP Usage), the SCU must send a valid value within the published range. We guarantee to support all published values. A missing attribute would result in returning an error of Missing Attribute, an invalid value would result in returning an error of Invalid Value and an Out of Range value would result in returning an error of Out of Range. It is up to the SCU to retry with a new value or to abort the association.

- For all DICOM attributes of type U (shown in the column of SCP Usage), the Default Value or the Configured Value (if it exists) is used for all cases of Missing Attribute, Invalid Value or Out of Range. No error would be generated from this type. We will send back the corrected value (i.e. the value being used) to the SCU. It is up to the SCU to accept, to decline (abort) or to resend a new value at this point.

Note: M (Mandatory), MC (Mandatory Conditional), and U (User Optional) are defined and discussed in Section 5.4, “Usage Specification,” and Section H.2.4, “Usage Specification,” of [PART4].

- Attributes received at the Image Box level will override the same attribute received at the Film Box level for a particular image.

0.4. Accessing this Conformance Statement on the World Wide Web

As the DryView 8150 Laser Imager product changes, changes to this DICOM Conformance Statement are inevitable. To obtain the most recent revision of this DICOM Conformance Statement, access the following URL:

<http://www.kodak.com/global/en/health/serviceAndSupport/dicom.jhtml>

0.5. Definitions, Acronyms, Abbreviations

The following symbols and abbreviations are used in this document.

Acronym/Abbreviation Definitions

8150: Kodak DryView 8150 Laser Imager

ASCII: American Standard Code for Information Interchange

AE: Application Entity

CS: Curve Shape

DICOM: Digital Imaging and Communications in Medicine

DIMSE: DICOM Message Service Element

ISO: International Standards Organization

MIM: *Kodak* PACS Link Medical Image Manager software

PDU: Protocol Data Unit

PLUT: Presentation Look-Up Table

RGB: A system for representing color pixels; combines RED, GREEN and BLUE in various proportions to obtain any color in the visible spectrum

SCP: Service Class Provider

SCU: Service Class User

SOP: Service-Object Pair

TCP/IP: Transmission Control Protocol/Internet Protocol

TFT/ULUT: Transfer Function Table

UID: Unique Identifier

YIQ: A system for representing color pixels; the color primary system adopted by National Television System Committee (NTSC) for color TV broadcasting

0.6. References

The following documents are referenced by this specification.

Reference / Title

PART3: DICOM Standard Part 3: Information Object Definitions (PS 3.3-2001)

PART4: DICOM Standard Part 4: Service Class Specifications (PS 3.4-2001)

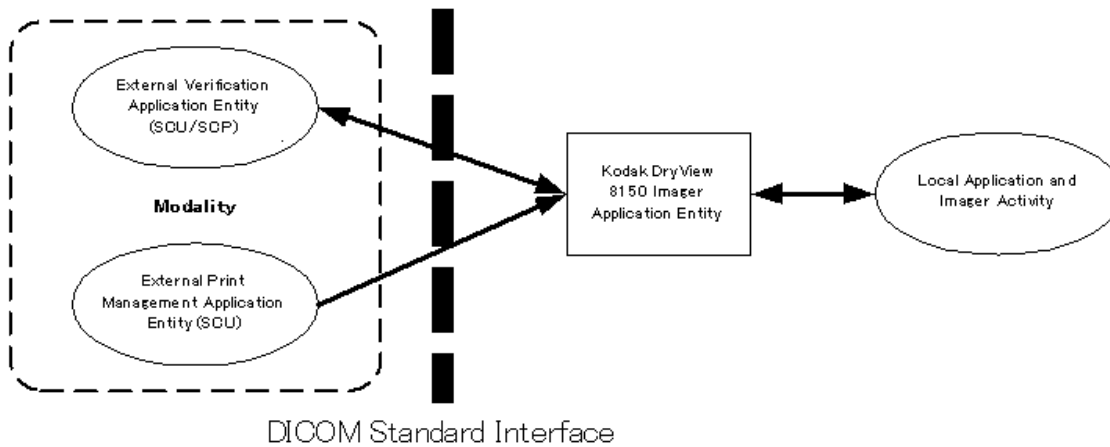
PART5: DICOM Standard Part 5: Data Structures and Encoding (PS 3.5-2001)

PART7: DICOM Standard Part 7: Message Exchange (PS 3.7-2001)

PART8: DICOM Standard Part 8: Network Communication Support for Message Exchange (PS 3.8-2001)

1. Implementation Model

This implementation model uses the DICOM Basic Print Management Meta SOP Class to receive studies for the 8150. Multiple associations from SCUs are supported.



1.1. Functional Definitions

The 8150 acquires images from the connected device(s). Studies are temporarily stored on disk. The images are then formatted and printed to film.

1.2. Sequencing of Real-World Activities

The 8150 prints images to film after receiving all required information from an SCU. It operates as required to meet the definition of the Print Management Service Class.

2. Application Entity Specifications

The 8150 provides Standard Conformance to the following SOP Classes as an SCU:

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1

The 8150 provides Standard Conformance to the following SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
Basic Annotation Box SOP Class	1.2.840.10008.5.1.1.15
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23

2.1. Association Establishment Policies

2.1.1. General

2.1.1.1. Delivery - Basic Grayscale/Color Print Management SCP

The 8150 maximum PDU size is 128 Kbytes.

2.1.2. Number of Associations

The number of simultaneous associations is configurable and the maximum number of associations is 12. If an attempt is made to open more than the number of configured simultaneous associations, the 8150 will reject the additional associations (A-ASSOCIATE-RJ).

2.1.3. Asynchronous Nature

The 8150 only allows 1 invoked and 1 performed operation on an Association at any given time (it is synchronous, e.g. the SCU can send only 1 Request and must wait for the correspondent Response before sending the next Request).

2.1.4. Implementation Identifying Information

The 8150 provides the Implementation Class UID of “1.2.840.113564.3.1.9”.

The implementation version name attribute is of the form of “**MIM**yyvv” where yy is the Released Year and vn is the Version Number. (e.g. MIM04v5.7 stands for Medical Image Manager software, released in 2004, of version 5.7)

The 8150 establishes an Association using its network node name for the calling DICOM Application Entity title. The network node name is configurable through the 8150's Service Tool.

2.2. Association Acceptance Policy

2.2.1. Associated Real-World Activity

2.2.1.1. Delivery - Basic Grayscale/Color Print Management SCP

The 8150 accepts Associations for the purpose of acquiring and printing images.

When an association has been established:

- The SCU can request the 8150 to create a Film Session, a Film Box, and Image Boxes.
- The SCU can request to change the attributes that are allowed for Film Boxes and Image Boxes.

The port number is configurable, and the default setting is 5040.

2.2.1.2. Application Entity Titles (AE_TITLE)

The Called AE Title may be used to select behavior which is unique to Kodak legacy products for backwards compatibility. The AE_TITLE should be configured at the SCU to ensure proper functionality with the 8150. The length of the Called AE Title must be no longer than 16 characters.

- NER_ option of the AE Title

If the Called AE Title begins with “NER_”, the 8150 will provide status changes as they occur. The SCU must have the capability to receive the unsolicited N-Event-Report.

- Suffix “/1..6” option of the AE Title

If the Called AE Title contains a suffix “/” followed by a single digit, the number specified will be used to select the output bin (e.g. “/1” will select bin 1, “/6” will select bin 6). Since the 8150 does not have a film sorter, all bin selections will be mapped to bin 1. Film Destination (2000,0040) in Film Session will override this option.

- Suffix “/C” option of the AE Title

Curve shape tone scaling values are usually interpreted in standard 0-999 range. However, to support Kodak legacy devices, the 8150 can be configured to accept the curve shape in the 0-690 range. If the Called AE Title contains a suffix “/C”, the 0-690 range shall be used.

2.2.1.3. Association Negotiation

If the association is accepted, the list of requested Presentation Context items is returned with each item marked as accepted or rejected with the Result/Reason field containing the values specified in Table 9-18, “Presentation Context Item Fields,” of [PART8].

If the association is rejected, the Result, Source, and Reason/Diagnostic fields in the response message contain the values show below:

Condition	Result	Source
Limit on simultaneous associations exceeded	2 – Rejected Transient	3 - DICOM UL Service Provider (Presentation)
The called AE title does not correspond to a recognized printer.	1 – Rejected Permanent	1 - DICOM UL Service User
The IP Connection could not established.	2 – Rejected Transient	3 – DICOM UL Service Provider (Presentation)
The destination printer is recognized, but not installed.	1 - Rejected Permanent	1 - DICOM UL Service User
No Implementation UID	1 - Rejected Permanent	2 – DICOM UL Service Provider (ACSE)
No Application Context Name	1 – Rejected Permanent	2 – DICOM UL Service Provider (ACSE)
DICOM protocol version is not supported	1 – Rejected Permanent	2 – DICOM UL Service Provider (ACSE)
No Presentation Context items given.	1 – Rejected Permanent	2 – DICOM UL Service provider (ACSE)
No presentation context items accepted	1 – Rejected Permanent	1 - DICOM UL Service User

2.2.2. Presentation Context Table

The 8150 accepts the Presentation Contexts shown below. Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Negot
Name	UID	Name List	UID		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Basic Grayscale Print Management	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Basic Color Print Management	1.2.840.10008.5.1.1.18	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	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
Presentation LUT	1.2.840.10008.5.1.1.23	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

NOTE: The 8150 supports Little Endian byte ordering only, for both Implicit and Explicit VRs. It does not support Big Endian byte ordering. Refer to Annex A of [PART5] for more information on transfer syntaxes.

2.2.3. SOP Specific Conformance

2.2.3.1. Verification

The 8150 provides standard conformance to the DICOM Verification Service Class. Upon receipt from an SCU of a verification of communication request, the 8150 will issue confirmation.

2.2.3.2. *Delivery- Basic Print Management SCP*

The 8150 provides standard SCP conformance to the DICOM Basic Print Management SOP Class. Association attempts will be rejected if more than the maximum number of simultaneous delivery SCP associations are attempted.

2.3. Basic Print Management Meta SOP Class

The Meta SOP Class is defined by the following set of supported SOP Classes:

SOP Class	UID Value
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.16

The Basic Grayscale Image Box SOP Class or the Basic Color Image Box SOP Class may be used within a Film Session, but these two classes must not be mixed within the same session. If Basic Color Image Box SOP Class is negotiated, the color images will be converted to grayscale and printed.

2.3.1. *Basic Film Session SOP Class*

2.3.1.1. *DIMSE Service N-CREATE*

Attribute	SCP Usage	Tag	Possible Values	Default Values
Number of Copies	U	(2000,0010)	1 → 99	1
Print Priority	U	(2000,0020)	HIGH, MED, LOW	MED
Medium Type	U	(2000,0030)	BLUE FILM, CLEAR FILM	BLUE FILM Default can be changed through configuration
Film Destination	U	(2000,0040)	MAGAZINE, PROCESSOR, BIN_n (where n=1 to 6) Note: Because the 8150 does not have a film sorter, all values of n will be mapped to 1. The values of MAGAZINE and PROCESSOR will be mapped to BIN_1. If no value is provided, the default will be used.	BIN_1
Film Session Label	U	(2000,0050)	Up to 64 characters may be provided. See Annex A	Null String
Memory Allocation	U	(2000,0060)	Not used	Not used

2.3.1.2. Film Session N-Create Status Code

Code	Status	Action/Meaning
0000H	Success	Film session created. Some attributes may have different values than those that were requested. The changed attributes will be returned with the values that were used. ([PART7] C.1.1)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)
0210H	Failure	A Film Session already exists. Another is not created. ([PART7] C.5.9)

2.3.1.3. DIMSE Service N-Action

The 8150 uses N-ACTION to accept print commands from the SCU. Once a print command is received, the 8150 prints all films in the session. The 8150 conforms to the N-ACTION specification in Section H.4.1.2.4 of [PART4], and the 8150 collates all Film Boxes when printed.

2.3.1.4. Film Session N-Action Status Code

Code	Status	Action/Meaning
0000H	Success	All images in the session are printed as specified. ([PART7] C.1.1)
0112H	Failure	The SOP Instance UID of the requested Film Session is returned. ([PART7] C.5.19)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)
C600H	Failure	Nothing is printed. ([PART4] H.4.1.2.4.2)
B602H	Warning	Nothing is printed. ([PART4] H.4.1.2.4.2)

2.3.1.5. DIMSE Service N-SET

The 8150 uses N-SET to update the Film Session values as supplied by the SCU.

2.3.1.6. Film Session N-Set Status Code.

Code	Status	Action/Meaning
0000H	Success	Film session data is set. Some attributes may have different values than those that were requested. The changed attributes will be returned with the values that were used. ([PART7] C.1.1)
0112H	Failure	The SOP Instance UID of the requested Film Session is returned. ([PART7] C.5.19)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)

2.3.1.7. Film Session N-Delete Status Code.

Code	Status	Action/Meaning
0000H	Success	The Film session is deleted. ([PART7] C.1.1)
0112H	Failure	The SOP Instance UID of the specified Film Session was not found. ([PART7] C.5.19)

2.3.2. Basic Film Box SOP Class

2.3.2.1. DIMSE Service N-CREATE

Attribute	SCP Usage	Tag	Possible Values	Default Values
Image Display Format	M	(2010,0010)	STANDARD\C,R For both PORTRAIT and LANDSCAPE Film Orientation, (C,R) may = (1,1) (1,2) (2,1) (2,2) (2,3) (3,2) (2,4) (4,2) (3,3) (3,4) (4,3) (3,5) (5,3) (4,4) (4,5) (5,4) (4,6) (6,4) (5,6) (6,5) (5,7) (7,5) (i.e. support 1-up, 2-up, 4-up, 6-up, 8-up, 9-up, 12-up, 15-up, 16-up, 20-up, 24-up, 30-up, and 35-up standard formats) ROW\r1,r2,r3...where r1, r2, r3...is the number of images in each row. The rows are limited to 7 and the number of images in each row is limited to 7. CUSTOM\I I = 101, 102 Only valid for PORTRAIT Film Orientation (2010,0040).	None. SCU must provide this value.
Referenced Film Session Sequence	M	(2010,0500)		
>Referenced SOP Class UID	M	(0008,1150)		
>Referenced SOP Instance UID	M	(0008,1155)		
Referenced Basic Image Box Sequence	M	(2010,0510)		
Referenced Basic Annotation Box Sequence	MC	(2010,0520)		
Film Orientation	U	(2010,0040)	PORTRAIT, LANDSCAPE	PORTRAIT
Film Size ID	U	(2010,0050)	11INX14IN 14INX14IN 14INX17IN See Annex C for detailed explanation	14INX17IN Default can be changed through configuration
Magnification Type	U	(2010,0060)	REPLICATE, BILINEAR, CUBIC, NONE See Annex E for Magnification Type Conversion.	CUBIC Default can be changed through configuration

Image Max Density	U	(2010,0130)	BLUE_FILM: 21* - 320** CLEAR_FILM: 21* - 310** NOTES: * The lowest density of 21 may not be achieved under certain conditions. The practical lower density is 22. ** The highest density shown may not be achieved under certain condition. The actual highest density is the lower value between the DICOM input and the calibrated density obtained from the imager.	300 if none specified. Default can be changed through configuration 320 if the Medium Type is BLUE FILM and the value is out of range. 310 if the Medium Type is CLEAR FILM and the value is out of range.
Configuration Information	U	(2010,0150)	Kodak Curve Shape (CS): 000 to 999 Kodak Contrast Values (CN): -1 to -5 Lower contrast 0 Normal +1 to +5 Higher contrast Kodak Pivot Density (PD): 0 to 2.4 in increments of 0.2 Perception LUT Selection (TFT/ULUT): LUT=m,n (m=string, n = 0 to 15) Kodak Text Macros (TM): %PRNTDAT%, %TIM%, %FOF%, %\$TIME\$%, %SES% Perception LUT cannot be used with Curve Shape, Contrast or Pivot Density. See Annex A for description	Configurable Configurable 1.2 LUT=VER693C0.W 87,6 None
Referenced Presentation LUT Sequence	MC	(2050,0500)	If the PLUT is received, the tonescaling data from the above Configuration Information will be ignored.	
>SOP Class	MC	(0008,1150)		
>SOP Instance	MC	(0008,1155)		

Annotation Display Format ID	U	(2010,0030)	0 – No annotation 1 – Text centered at bottom of film 6 – Six annotation positions on two lines, centered at bottom of film. NONE – No annotation LABEL – Annotation at bottom of film. BOTTOM – Text at bottom of images. COMBINED – 1 line at the bottom of the page and 1 line under each image. See Basic Annotation Box SOP (section 2.4) for valid values for Annotation Position (2030,0010) for each of these formats.	0 (No annotation)
Border Density	U	(2010,0100)	BLACK, WHITE, i, where i = 0 - 399	Image Max Density
Empty Image Density	U	(2010,0110)	BLACK, WHITE	Border Density Value All values will be mapped to BLACK.
Min Density	U	(2010,0120)	0-399 This value is used only when PLUT or Curve Shape is applied to the image(s) on the page.	DMin of the film
Illumination	MC	(2010,015E)	Positive integer in units of cd/m^2	2000
Reflective Ambient Light	MC	(2010,0160)	Positive integer in units of cd/m^2	10
Trim	U	(2010,0140)	YES, NO	NO

2.3.2.2. *Film Box N-Create Status Code.*

Code	Status	Action/Meaning
0000H	Success	Film box created. Some attributes may have different values than those that were requested. The changed attributes will be returned with the values that were used. ([PART7] C.1.1)
0112H	Failure	The Film Session requested to contain this Film Box does not exist. ([PART7] C.5.19)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)
0213H	Failure	Page limit is exceeded. ([PART7] C.5.22)
0120H	Failure	The attribute tag of the missing required attribute is returned. ([PART7] C.5.13)
0121H	Failure	The Film Box is not created. The required attribute was present, but contained no value. ([PART7] C.5.13)
0106H	Failure	The invalid attribute value is returned in the response data set. ([PART7] C.5.11)

2.3.2.3. *DIMSE Service N-ACTION*

The 8150 uses the N-ACTION to accept print instruction from the SCU. When such an instruction is received, the 8150 prints the current film in the session.

2.3.2.4. *Film Box N-Action Status Code.*

Code	Status	Action/Meaning
0000H	Success	All images in the Film Box are printed as specified. ([PART7] C.1.1)
0112H	Failure	The Film Box does not exist. ([PART7] C.5.19)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)
B602H	Warning	Nothing is printed ([PART4] H.4.1.2.42)

2.3.2.5. *DIMSE Service N-SET*

The 8150 uses N-SET to update the Basic Film Box values as supplied by the SCU. The following attributes may be updated:

Attribute	SCP Usage	Tag
Magnification Type	U	(2010,0060)
Max Density	U	(2010,0130)
Configuration Information	U	(2010,0150)
Smoothing Type	U	(2010,0080)
Border Density	U	(2010,0100)
Empty Image Density	U	(2010,0110)
Min Density	U	(2010,0120)
Illumination	MC	(2010,015E)
Reflective Ambient Light	MC	(2010,0160)
Trim	U	(2010,0140)

2.3.2.6. Film Box N-Set Status Code.

Code	Status	Action/Meaning
0000H	Success	Film box data is set. Some attributes may have different values than those that were requested. The changed attributes will be returned with the values that were used. ([PART7] C.1.1)
0112H	Failure	The specified Film Box does not exist. ([PART7] C.5.19)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)
0213H	Failure	Page limit is exceeded. ([PART7] C.5.22)
0120H	Failure	The attribute tag of the missing required attribute is returned. ([PART7] C.5.13)
0121H	Failure	The required attribute was present, but contained no value. ([PART7] C.5.13)
0106H	Failure	The invalid attribute value is returned in the response data set. ([PART7] C.5.11)

2.3.2.7. DIMSE Service N-DELETE

Upon receipt of an N-DELETE from the SCU, the 8150 removes the individual Film Box from the session.

2.3.2.8. Film Box N-Delete Status Code.

Code	Status	Action/Meaning
0000H	Success	The Film Box is deleted. ([PART7] C.1.1)
0112H	Failure	The SOP Instance UID of the specified Film Session is returned. ([PART7] C.5.19)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)

2.3.3. Basic Grayscale Image Box SOP Class

2.3.3.1. DIMSE Service N-SET

Attribute & Usage	SCP Usage	Tag	Supported Values	Default Values
Image Position	M	(2020,0010)	All values within the range of Image Display Format	None. SCU must provide value
Preformatted Grayscale Image Sequence	M	(2020,0110)		
>Samples Per Pixel	U	(0028,0002)	1	1
>Photometric Interpretation	U	(0028,0004)	MONOCHROME1, MONOCHROME2	MONOCHROME2
>Rows	M	(0028,0010)	See Appendix D for the maximum values	None. SCU must provide value.
>Columns	M	(0028,0011)	See Appendix D for the maximum values	None. SCU must provide value.
>Pixel Aspect Ratio	MC	(0028,0034)	R/C R, C = 1 to 9999 (Integer)	1\1
>Bits Allocated	M	(0028,0100)	8, 16	None. SCU must provide value.
>Bits Stored	M	(0028,0101)	8, 10, 12	None. SCU must provide value.
>High Bit	M	(0028,0102)	Bits Stored – 1	None. SCU must provide value.
>Pixel Representation	M	(0028,0103)	0000H (unsigned integer)	0000H
>Pixel Data	M	(7FE0,0010)	All values consistent with Bits Stored	None. SCU must provide value.
Polarity	U	(2020,0020)	NORMAL, REVERSE Note: Polarity only applies to the Image, not the Border Density.	NORMAL

Magnification Type	U	(2010,0060)	REPLICATE, BILINEAR, CUBIC, NONE	CUBIC
Smoothing Type	U	(2010,0080)	NORMAL (minimum cubic convolution error) – valid for all Magnification Types ENHANCED – only valid for Magnification Type of CUBIC ENHANCED1 – only valid for Magnification Type of CUBIC 0.0 - only valid for Magnification Type of CUBIC Please see Annex E for all other possible combinations.	5 Default can be changed through configuration
Configuration Information	U	(2010,0150)	Kodak Curve Shape (CS): 000 to 999 Perception LUT Selection (LUT): LUT=m, n (m=string, n = 0 to 15) Curve Shape and Perception LUT are mutually exclusive. See Annex A for description	None.
Requested Image Size	U	(2020,0030)	Width of Image Box in millimeters (fractional millimeters supported) 0.0 indicates “Maximize film utilization while maintaining Image aspect ratio”. Please see Annex D for maximum Requested Size for each Film Size. If this value exceeds the available dimensions of the Image Box, it will be accepted only if the Requested Decimate/Crop Behavior value is NOT set to FAIL. An icon will be added to the page indicating that the Requested Image Size was not achieved.	0.00
Requested Decimate/Crop Behavior	U	(2020,0040)	DECIMATE, CROP, FAIL DECIMATE: If the Image Size exceeds the printable area, the Image Size will be reduced while preserving the full view of the Image. An icon will be added to the page indicating that the Image has been decimated.. CROP: If the Image Size exceeds the printable area, the Image will be center cropped by removing pixels that fall outside the printable area. An icon will be added to the page indicating that the Image has been cropped. FAIL: If the Image Size exceeds the printable area the Image will be rejected.	DECIMATE Default can be changed through configuration
Referenced Presentation LUT Sequence	U	(2050,0500)		
>SOP Class UID	U	(0008,1150)		
>SOP Instance UID	U	(0008,1155)	UID of any previously created PLUT instance, as outlined in Section 2.5.	

2.3.3.2. ImageBox N-Set Status Code.

Code	Status	Action/Meaning
0000H	Success	Image box data is set. Some attributes may have different values than those that were requested. The changed attributes will be returned with the values that were used. ([PART7] C.1.1)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)
0112H	Failure	The specified Film Box does not exist. ([PART7] C.5.19)
0213H	Failure	Page limit is exceeded. ([PART7] C.5.22)
0120H	Failure	The attribute tag of the missing required attribute is returned. ([PART7] C.5.13)
0121H	Failure	The required attribute was present, but contained no value. ([PART7] C.5.13)
0106H	Failure	The invalid attribute value is returned in the response data set. ([PART7] C.5.11)

2.3.4. Basic Color Image Box SOP Class

The 8150 will accept color images. The color images will be converted to grayscale using the RGB to YIQ transformation algorithm and printed.

2.3.4.1. DIMSE Service N-SET

Attribute & Usage	SCP Usage	Tag	Supported Values	Default Values
Image Position	M	(2020,0010)	All values within the range of Image Display Format	None. SCU must provide value
Basic Color Image Sequence	M	(2020,0111)		
>Samples Per Pixel	U	(0028,0002)	3	3
>Photometric Interpretation	U	(0028,0004)	RGB	RGB
>Planar Configuration	M	(0028,0006)	000H or 001H 000H – pixels arrive in R ₁ G ₁ B ₁ R ₂ G ₂ B ₂ R ₃ G ₃ B ₃ ... order 001H – pixels arrive in R ₁ R ₂ R ₃ ..., G ₁ G ₂ G ₃ ... B ₁ B ₂ B ₃ ... order	None. SCU must provide value.
>Rows	M	(0028,0010)	See Appendix D for the maximum values applied to the case of Requested Decimate/Crop Behavior of FAIL	None. SCU must provide value.
>Columns	M	(0028,0011)	See Appendix D for the maximum values applied to the case of Requested Decimate/Crop Behavior of FAIL	None. SCU must provide value.
>Pixel Aspect Ratio	MC	(0028,0034)	R/C R, C = 1 to 9999 (Integer)	1\1
>Bits Allocated	U	(0028,0100)	8	8
>Bits Stored	U	(0028,0101)	8	8
>High Bit	U	(0028,0102)	7	7
>Pixel Representation	M	(0028,0103)	0000H (unsigned integer)	0000H
>Pixel Data	M	(7FE0,0010)	All values consistent with Bits Stored	None. SCU must provide value.
Polarity	U	(2020,0020)	NORMAL, REVERSE Note: Polarity only applies to the Image, not the Border Density.	NORMAL

Magnification Type	U	(2010,0060)	REPLICATE, BILINEAR, CUBIC, NONE	CUBIC
Smoothing Type	U	(2010,0080)	NORMAL (minimum cubic convolution error) – valid for all Magnification Types ENHANCED – only valid for Magnification Type of CUBIC ENHANCED1 – only valid for Magnification Type of CUBIC 0-15 - only valid for Magnification Type of CUBIC Please see Annex E for all other possible combinations.	5 Default can be changed through configuration
Configuration Information	U	(2010,0150)	Kodak Curve Shape (CS): 000 to 999 Perception LUT Selection (LUT): LUT=m, n (m=string, n = 0 to 15) Curve Shape and Perception LUT are mutually exclusive. See Annex A for description	None.
Requested Image Size	U	(2020,0030)	Width of Image Box in millimeters (fractional millimeters supported) 0.00 indicates "Maximize film utilization while maintaining Image aspect ratio". Please see Annex D for maximum Requested Size for each Film Size. If this value exceeds the available dimensions of the Image Box, it will be accepted only if the Requested Decimate/Crop Behavior value is NOT set to FAIL. An icon will be added to the page indicating that the Requested Image Size was not achieved.	0.00
Requested Decimate/Crop Behavior	U	(2020,0040)	DECIMATE, CROP, FAIL DECIMATE: If the Image Size exceeds the printable area, the Image Size will be reduced while preserving the full view of the Image. An icon will be added to the page indicating that the Image has been decimated. CROP: If the Image Size exceeds the printable area, the Image will be center cropped by removing pixels that fall outside the printable area. An icon will be added to the page indicating that the Image has been cropped. FAIL: If the Image Size exceeds the printable area the Image will be rejected.	DECIMATE Default can be changed through configuration
Color Profile	U	(2011,0160)	DEFAULT1, DEFAULT2, DEFAULT3, DEFAULT4, DEFAULT5, DEFAULT6 NOTE: This value is accepted, but ignored by the DV8150.	None.

2.3.4.2. Basic Color Image Box N-Set Status Code.

Code	Status	Action/Meaning
0000H	Success	Image box data is set. Some attributes may have different values than those that were requested. The changed attributes will be returned with the values that were used. ([PART7] C.1.1)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)
0112H	Failure	The specified Film Box does not exist. ([PART7] C.5.19)
0213H	Failure	Page limit is exceeded. ([PART7] C.5.22)
0120H	Failure	The attribute tag of the missing required attribute is returned. ([PART7] C.5.13)
0121H	Failure	The required attribute was present, but contained no value. ([PART7] C.5.13)
0106H	Failure	The invalid attribute value is returned in the response data set. ([PART7] C.5.11)

2.3.5. Printer SOP Class

2.3.5.1. DIMSE Service N-GET

Changes in printer status will be sent when they occur using N-EVENT-REPORT only if the 8150 is configured to do so. Otherwise, the SCU can use the N-GET to retrieve an instance of the Printer SOP class.

Printer Status (2110,0010) and Printer Status Info (2110,0020) will be returned with all N-GET requests of the Printer SOP class.

Attribute	SCP Usage	Tag	Supported Values
Printer Status	M	(2110,0010)	NORMAL WARNING FAILURE
Printer Status Info	M	(2110,0020)	for NORMAL conditions: NORMAL for WARNING conditions: BAD SUPPLY MGZ CALIBRATION ERR COVER OPEN EMPTY 11X14 BLUE EMPTY 11X14 CLR EMPTY 14X14 BLUE EMPTY 14X14 CLR EMPTY 14X17 BLUE EMPTY 14X17 CLR FILM JAM FILM TRANSP ERR PRINTER INIT PRINTER OFFLINE PROC INIT for FAILURE conditions: ELEC DOWN PRINTER DOWN PROC DOWN
Printer Name	U	(2110,0030)	Any value up to 16 characters in length. Chosen by user at time of installation
Printer Manufacturer	U	(0008,0070)	EASTMAN KODAK
Printer Manufacturer Model Name	U	(0008,1090)	Any value up to 16 characters in length. Chosen by user at time of installation.
Printer Device Serial Number	U	(0018,1000)	AAAAAAAA (number up to 8 ASCII characters)
Software Version	U	(0018,1020)	"X.Y" (ID up to 6 ASCII characters)
Date of Last Calibration	U	(0018,1200)	Not supported
Time of Last Calibration	U	(0018,1201)	Not supported

2.3.5.2. *Printer SOP N-Get Status Code.*

Code	Status	Action/Meaning
0000H	Success	Printer Status and Printer Status Info are always returned along with the requested attribute values. ([PART7] C.1.1)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)

2.4. Basic Annotation Box SOP Class

2.4.1. DIMSE Service N-SET

The Basic Annotation Box SOP Instance is created by the SCP at the time of the Basic Film Box SOP Instance is created, based on the value of the Annotation Display Format ID attribute (2010,0030) of the Basic Film Box.

A maximum of 6 annotation boxes may be received with a Film Box.

Attribute & Usage	SCP Usage	Tag	Supported Values	Default Values
Annotation Position	M	(2030,0010)	Annotations are placed in order from upper-left to lower-right. If the Annotation Display Format ID is 1, then value must be 1. The text will be printed on one line at the bottom of the film. If the Annotation Display Format ID is 6, then valid range is 1-6. The text will be printed within 2 lines at the bottom of the film, within 6 different positions. If the Annotation Display Format ID is LABEL, the valid range is 0-1. The text will be printed at the bottom of the film on two lines. If the Annotation Display Format ID is BOTTOM, then the valid range is 1 to the number of images in the Film Box. The text will be placed below the images. If the Annotation Display Format ID is COMBINED, then the valid range is 0 to the number of images in the Film Box. Position 0 will be printed at the bottom of the film. The other annotations will be printed below the images. Any annotation box with a position outside the valid range will be ignored and a warning code of 0116H will be returned to the SCU	None.
Text String	M	(2030,0020)	Up to 64 characters (see Note)	None.

Note: the number of characters displayed may be less than 64 characters depending on the size of the film, the page format, the annotation format and the characters used. This exception does not apply to Annotation Format IDs of LABEL or 1.

2.4.2. Annotation N-Set Status Code.

Code	Status	Action/Meaning
0000H	Success	The annotation data is set.
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.1.1)
0112H	Failure	The annotation box does not exist. ([PART7] C.5.21)
0116H	Warning	Invalid Position was specified. ([PART7] C.5.19)
0213H	Failure	Page limit is exceeded. ([PART7] C.5.22)

2.5. Presentation LUT SOP Class

2.5.1. DIMSE Service N-CREATE

The Presentation LUT SOP Instance is created by the SCP upon receipt of the N-CREATE action. The Print SCU must create the Presentation LUT instance prior to referencing it in the Basic Film Box. Multiple Presentation LUT instances are supported in an association, but only one instance will be supported for each image.

The SCU shall send either Presentation LUT Sequence or the Presentation LUT Shape. These values are mutually exclusive and the action will result in an error if neither or both are present. The presence of the Presentation LUT instance overrides any data set in the Configuration Information attribute (2010,0150) of the Film Box or Image Box.

Attribute & Usage	SCP Usage	Tag	Supported Values	Default Values
Presentation LUT Sequence	M	(2050,0010)		None.
>LUT Descriptor	M	(0028,3002)	The first value is the number of entries in the lookup table. The number of entries shall be equal to the number of possible values in the input. (For 8 bit input will be 256 entries, for 12 bit input it will be 4096 entries) The second value is the first input value mapped, and shall always be 0. The third value specifies the number of bits for each entry in the LUT Data. It shall be between 10 and 16 inclusive.	None.
>LUT Explanation	U	(0028,3003)	Free form text explanation of the meaning of the LUT.	None.
>LUT Data	M	(0028,3006)	The LUT Data shall be stored in a format equivalent to 16 bits allocated where the high bit is equal to bits stored - 1, where bits stored is the third value of the LUT Descriptor.	None.
Presentation LUT Shape	M	(2050,0020)	Enumerated values IDENTITY and LIN OD.	None.

2.5.2. Presentation LUT N-Create Status Code.

Code	Status	Action/Meaning
0000H	Success	The Presentation LUT is created. Some attributes may have different values than those that were requested. The changed attributes will be returned with the values that were used. ([PART7] C.1.1)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)

2.5.3. DIMSE Service N-DELETE

Upon receipt of an N-DELETE from the SCU, the 8150 removes the Presentation LUT instance.

2.5.4. Presentation LUT N-Delete Status Code.

Code	Status	Action/Meaning
0000H	Success	The Presentation LUT is deleted. ([PART7] C.1.1)
0110H	Failure	The Error Comment field will contain the detailed description of the error. ([PART7] C.5.21)

3. Communication Profiles

3.1. Supported Communications Stacks

The 8150 provides TCP/IP Network Communication Support as defined in [PART8].

3.2. Physical Media

The 8150 supports Ethernet with the following physical connectors:

- Unshielded Twisted pair (10BaseT and 100BaseT)

4. Extensions/Specializations/Privatizations

There are no extensions, specializations or privatizations.

5. Configuration

The following attributes are configurable by a qualified service provider:

- IP address
- DICOM Port
- Subnet Mask
- Local Network Host Name (8150 AE Title)
- Router Address (Gateway)
- Basic Color Print Management Meta SOP (supported or unsupported)
- Presentation LUT SOP (supported or unsupported)
- Film Sizes available
- Other destination properties

6. Support of Extended Character Sets

The 8150 supports:

1. The ISO-IR 100 Latin 1 character set, as well as the ISO-IR 6 default character set.
2. The ISO-IR 87 character set, part of the JIS X 0208 code table for 2-byte Japanese character sets which supports Kanji (ideograph), Hiragana and Katakana (phonetic).
3. The ISO-IR 13 character set, part of the JIS X 0201 code table for single-byte Japanese Katakana (phonetic) characters.

The 8150 supports the following values for the Specific Character Set (0008,0005) tag:

- a) “ISO_IR 6” (default repertoire),
- b) “ISO_IR 100” (Latin 1),
- c) “ISO_IR 13” (Katakana),
- d) “ISO 2022 IR 13\ISO 2022 IR 87” (Katakana, Hiragana, Kanji),
- e) “GB18030” (Traditional and Simplified Chinese, Katakana, Hiragana, Kanji),
- f) or blank (ISO-IR 6 is the default character set).

For detailed information, refer to Section C.12.1.1, “Specific Character Set,” of [PART3].

7. Error Handling

Warnings indicate that the operation/notification has been completed, but an error was detected. Failures convey that the operation/notification failed and was not performed. Refer to Annex C of [PART7] for the Status Types supported by the DIMSE services.

Annex A - Configuration Information

The Configuration Information attribute contains the list of *Kodak*-specific values. These attributes are not DICOM standard attributes.

The Configuration Information value is an ordered list. The attribute is specified using the ASCII two-character key prefix in the following sequence:

- 1) Curve Shape, Contrast, Pivot Density or Perception LUT
- 2) Text Macros.

The Film Box Curve Shape value applies to all images in the Film Box except when Curve Shape or Perception LUT is specified for the image in the Image Box.

ATTRIBUTE	USAGE	DESCRIPTION			DEFAULT
Curve Shape designated by the ASCII two-character prefix: CS	U/M	000 to 999 Note: 000 = linear, 999 = highest curvature Curve Shape is a tone scale adjustment used to optimize the image on film compared to the image on the operator console monitor. Curve shape is not valid when a Perception LUT is specified.			Film Box: Value set in the Printer by the user Image Box: Basic Film Box Curve Shape
Contrast designated by the ASCII two-character prefix: CN	U/M	-5 to 5 Note: Integer values only. Negative Contrast settings are lower contrast where the amount of data that is represented by medium film densities is increased. Positive settings are higher contrast where the amount of data that is represented by high and low densities is increased.			Value set in the Printer by the user
Pivot Density designated by the ASCII two-character prefix: PD	U/M	0.0 to 2.4 Note: Value must be specified in increments of 0.2. Densities above and below the pivot density will be adjusted up and down by an amount, which is a function of the difference between the code value and the pivot density code value.			Value set in the Printer by the user
Perception LUT Selection designated by the ASCII three-character prefix: LUT	U/M	LUT = m, n Allows selection of the LUT that best suits the user's images. M is the name of the TFT/ULUT set and N specifies a contrast setting within the group. Curve shape will be ignored if the LUT parameter is used. m=string (0=default group) n=0 to 15 (0=use default value set at keypad)			m=0, n=0
Text Macros designated by the ASCII two-character key prefix: TM	M/M	%PRNTDAT% %TIM% %FOF% %\$TIME\$% %SES% (1-64 chars from the Film Session SOP Class)	Date of Printing Time of Printing Film of Film Count Time of Printing Film Session Label	DD-MM-YY HH:MM (HH=0-23) NN/MM HH:MM:SS AAAAAA	None
		Note: Text macros will be printed on the bottom of the film and will be truncated if necessary			

Examples

"CS333"

The curve shape is set to 1/3 of the printer's tone scale range and defaults are applied to contrast and pivot density.

"CS500\CN3\PD2.2"

The curve shape is set to 1/2 the printer's tone scale range, Contrast is set to 3, and pivot density is set to 2.2.

"PD2.0"

The pivot density is set to 2.0, and defaults are applied to curve shape and contrast.

"CS333\CN3\PD2.2\TM%PRNTDAT%%TIM%%FOF%"

The curve shape is set to 1/3 of the range, Contrast is set to 3, and pivot density is set to 2.2.

The following text macros will be printed on the bottom of the page:

Date of Printing, Time of Printing, and Film of Film count.

"LUT=Ver693c0.w87,3"

The Perception LUT TFT/ULUT set is "Ver693c0.w87" and the Contrast Setting is 3.

"LUT=0,3\ TM%PRNTDAT%%TIM%%FOF%"

The Perception LUT TFT/ULUT set is 0 (default) and the Contrast Setting is 3.

The following text macros will be printed on the bottom of the page:

Date of Printing, Time of Printing, and Film of Film count.

"TM%PRNTDAT%%TIM%%FOF%"

The following text macros will be printed at the bottom of the page:

Date of Printing, Time of Printing, and Film of Film count.

"PD2.0\CN4\CS333"

This is **invalid** because the attributes are out of order, curve shape must precede pivot density and contrast, and contrast must precede pivot density. It should be "CS333\CN4\PD2.0".

"CS333\PD1.2\LUT=0,3"

This is **invalid** because Curve Shape and Pivot Density cannot be mixed with Perception LUT. In this case, the Perception LUT setting will be used.

Annex B - Custom Formats

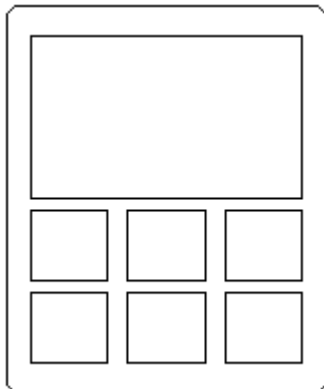
The following formats are supported:

Format ID 101

This format consists of 7 image positions, 1 large image in the upper section of the page and 6 smaller images in the lower section of the page. The approximate size and positioning of the images are defined in terms of the standard formats 2 and 12.

Upper Section: 1 frame of a 2-up format.

Lower Section: 6 frames of a 12-up format.

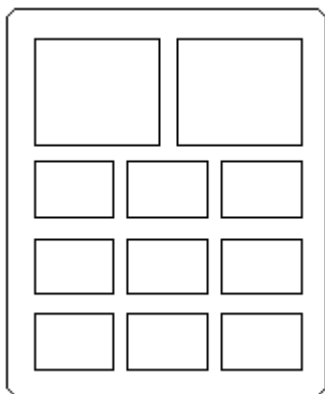


Format ID 102

This format consists of 11 image positions, 2 large images in the upper section of the page and 9 smaller images in the lower section of the page. The approximate size and positioning of the images are defined as follows:

Upper Section: 2 frames (top two from a 6-Up format on the whole page) occupying top 1/3 of media.

Lower Section: 9 frames (9-Up on the bottom 2/3 of the page) occupying bottom 2/3 of media.



Annex C - Unsupported Film Types

Note: In this section, “film size ID” and “requested film size” refer to DICOM tag (2010,0050); “medium type ID” and “requested film base” refer to DICOM tag (2000,0030).

If the requested film size and film base is currently installed, the imager prints the page on the specified film size and film base.

If the requested film size and film base is supported, but not currently installed, the imager stores the job in a queue and the user must change film cartridge to match the requested film size and film base before the job will be printed.

If the requested film size and film base are unsupported, the table in the latter part of this Annex illustrates the DV8150's behavior under these conditions.

The DV8150 combines the Medium Type and Film Size attributes internally into a composite Film Type. In the event that one or both of these attributes is specified, but does not match a film type configured in the DV8150, the following evaluation sequence occurs:

1. The highest priority is placed on matching the film base's transparent or reflective property (i.e. BLUE FILM or CLEAR FILM versus PAPER). If Medium Type was not specified, then this criterion does not apply and Step 2 is entered with a complete list of all films. If the transparent/reflective property cannot be matched, then the system moves to Step 2 with a complete list of all films. If the transparent/reflective property is matched then Step 2 is entered with only those films that match the criterion.
2. The next priority is granted to the Film Size ID. The DV8150 will attempt to match the film size to that requested in the N-CREATE Film Box. If Film Size ID is unspecified, then Step 3 is entered with a complete list of all films. If the film size is not matched, an attempt is made to find a reasonable size; films of this size are placed in the list for entry into Step 3. If the film size is matched, then Step 3 is entered with a list of films that exactly match the requested size.
3. Finally, an attempt is made to match the exact requested base (BLUE or CLEAR). If the imager cannot detect the media base loaded in the printer, it will assume media types based on configuration settings in the DV8150.

Note: For best results, Print SCU's should either specify films that are installed in the imager, or not specify these attributes at all.

Medium Type Supported	Medium Type Currently Installed	Film Size Supported	Film Size Currently Installed	Result
Yes	Yes	Yes	Yes	The imager prints the page on the specified film type.
Yes	Yes	Yes	No	The imager stores the page in a queue. User must change film magazines to the appropriate size to get printout.
Yes	Yes	No	*	The DV8150 replaces the requested Film Size with the next largest supported size for the imager. This new Film Size ID is what is passed to the printer. If no larger film size is available, then the next smallest supported film size is selected. In DV8150's response to the SCU, the Film Size ID is modified so that it contains the new Film Size ID. The page is either queued in the imager or printed.
Yes	No	Yes	Yes	The imager will print the page on the currently installed film for that size. The imager has no knowledge of the currently installed film base.
Yes	No	No	No	The DV8150 replaces the SCU's Film Size selection with the next largest supported size for the imager. If no larger film size is available, then the next smallest supported film size is selected. This new Film Size ID is what is passed to the imager. In DV8150's response to the SCU, the Film Size ID is modified so that it contains the new Film Size ID. The page is queued in the imager.
No	No	Yes	*	The DV8150 replaces the SCU's Medium Type selection with the supported medium type for the selected film size for the imager. This new Medium Type ID is what is passed to the imager. The page is queued in the imager.
No	No	No	No	The DV8150 replaces the SCU's Film Size selection with largest supported size for the destination. This new Film Size ID is what is passed to the imager. The medium type of this new film size will also be selected. In DV8150's response to the SCU, the Film Size ID is modified so that it contains the new Film Size ID. The page is queued in the imager.

Note: “*” indicates a “Don't Care” condition.

Annex D - Printer Specifications

The following tables list the details unique to the 8150.

Film Size

This table shows the accepted film sizes for the 8150. The Maximum Width/Height represents the largest pixel number accepted with and without annotation printed on the bottom of the film.

- If annotations are printed, some pixel space will be used for the text and the maximum image size will be reduced.
- If the minification or crop option is enabled, larger images may be printed but some image data will be discarded in order to fit onto the page. In this case, an icon will be added to the bottom of the page to indicate minification or crop has occurred.

Portrait Size Info:

Available Film Sizes	Max Image Width (Portrait) (pixel pitch = 12.80)		Max Height w/o Annotation (Portrait)	Max Height w/ Annotation (Portrait)
	Pixels	Mm		
11INX14IN	3440	268.70	4438	4310
14INX14IN	4438	346.80	4414	4286
14INX17IN	4438	346.80	5390	5262

Landscape Size Info:

Available Film Sizes	Max Image Width (Landscape) (pixel pitch = 12.80)		Max Height w/o Annotation (Landscape)	Max Height w/ Annotation (Landscape)
	Pixels	Mm		
11INX14IN	4438	346.80	3440	3312
14INX14IN	4414	344.80	4438	4310
14INX17IN	5390	421.10	4438	4310

The above table implicitly lists the maximum image values of a 1Up given the DICOM Requested Decimate/Crop Behavior attribute set to FAIL. For all other formats the maximum image values follows these general rules:

- In any Row, the sum of all Image Widths plus all Horizontal Separations can not exceed the above Max Width values.
- In any Column, the sum of all Image Lengths plus all the Vertical Separations can not exceed the above Max Height values.

Printer Capabilities

This table shows the unique capabilities for the 8150.

Color / Grayscale	Film Trays	Sorter Bin
Grayscale	1	NO

The following table shows the Printable Max Area for Multiple Page Format when horizontal and vertical separations are set to zero.

	11X14		14X14		14X17	
	Width	Height	Width	Height	Width	Height
1	3440	4438	4438	4414	4438	5390
2	3440	2219	4438	2207	4438	2695
4	1720	2219	2219	2207	2219	2695
6	1720	1479	2219	1471	2219	1796
8	1720	1109	2219	1103	2219	1347
9	1146	1479	1479	1471	1479	1796
12	1146	1109	1479	1103	1479	1347
15	1146	887	1479	882	1479	1078
16	860	1109	1109	1103	1109	1347
20	860	887	1109	882	1109	1078
24	860	739	1109	735	1109	898
30	688	739	887	735	887	898
35	688	634	887	630	887	770

Annex E - Smoothing Type Conversion Table

Input (DICOM)		Output	
Magnification	Smoothing Type	Magnification	Smoothing Type
NONE	-	NONE	0
REPLICATE	-	REPLICATE	0
BILINEAR	-	CUBIC	9
CUBIC	0	CUBIC	0
CUBIC	1	CUBIC	1
CUBIC	2	CUBIC	2
CUBIC	3	CUBIC	3
CUBIC	4	CUBIC	4
CUBIC	5	CUBIC	5
CUBIC	6	CUBIC	6
CUBIC	7	CUBIC	7
CUBIC	8	CUBIC	8
CUBIC	9	CUBIC	9
CUBIC	10	CUBIC	10
CUBIC	11	CUBIC	11
CUBIC	12	CUBIC	12
CUBIC	13	CUBIC	13
CUBIC	14	CUBIC	14
CUBIC	15	CUBIC	15
CUBIC	NORMAL	CUBIC	5
CUBIC	ENHANCED	CUBIC	6 *
CUBIC	ENHANCED1	CUBIC	6 *

*These are the closest mapping in the 0-15 smoothing range. There is no equivalence of Enhanced and Enhanced1 on the range of 0..15, Enhanced and Enhanced1 are achieved thru software's imaging rendering prior to the printing process.

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