



PHILIPS

DICOM 3.0 Conformance Statement Odyssey LX Print Service

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DICOM Print software release 9.4

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This Conformance Statement describes DICOM Print software release 9.4 for the Philips Odyssey LX Nuclear Medicine systems.

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Introduction

Medical imaging devices claiming conformance to the DICOM 3.0 standard must indicate in sufficient detail the service classes and information objects, as defined by the standard, to which they conform. This document details the conformance of the Philips Medical Systems Odyssey series Nuclear Medicine products to the DICOM 3.0 standard. The Odyssey systems must have Baseline 9 software as a minimum as well as the DICOM 3.0 Print option. This document does not attempt to detail any other medical imaging devices manufactured by Philips Medical Systems.

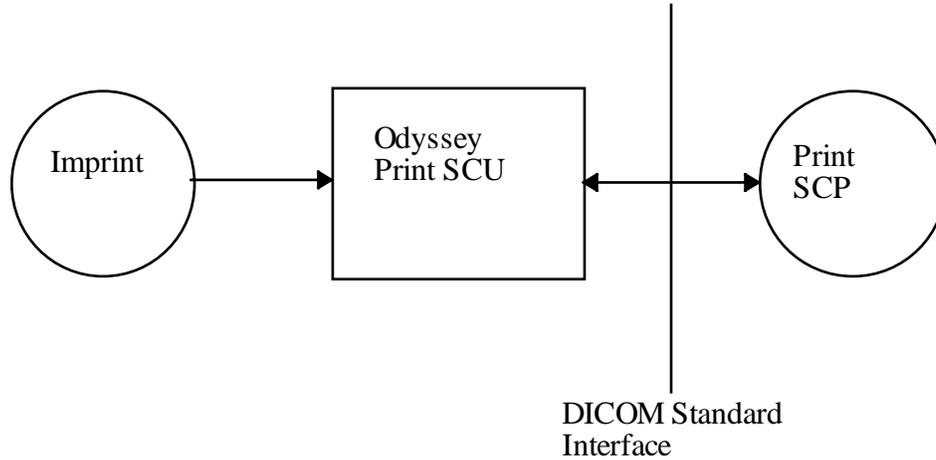
1 Implementation Model

This implementation provides for simple transfer of images using the DICOM Basic Grayscale Print Management Meta SOP Class and the Basic Color Print Management Meta SOP Class, as a Service Class User (SCU). Transfers from the Odyssey to a remote Printer are initiated by an operator by selecting the appropriate options from the Imprint general purpose printing application.

1.1 Application Data Flow Diagram

Image transfers from the Odyssey to a remote printer are started when the user manually selects the Print option on the Imprint control panel.

Figure 1.1-1. Implementation Model



1.2 Functional Definitions of AE's

The DICOM print software is started when the Print button, on the Imprint control panel, is clicked. Images are always printed in color unless 1) the printer does not support color printing, or 2) the operator selects Black&White only from the Imprint Options panel. In either case, the images are converted to grayscale images before being transferred to the printer.

1.3 Sequencing of Real-World Activities

The Print SCU is started when the operator clicks on the <PRINT> button on the Imprint control panel. At this time, a film session is requested, the associated Film Box and Image Boxes are created which describe one film page, and the film is printed. The film session is immediately deleted and the association is terminated. When subsequent film pages are ready to be printed, a new association is established and a new film session is created.

2 AE Specifications

The operational parameters for the DICOM print AE are derived from configuration files in the /prism/site directory.

2.1 AE1 - Specification

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes.

Table 2.1-1 Supported Meta SOP Classes

SOP Class Name	SOP Class UID	Role
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	SCU
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	SCU

Support for these two Meta SOP Classes as SCU also implies support for the SOP Classes listed in Table 2.1-2. However, the SCU never presents individual Presentation Contexts for these SOP Classes.

Table 2.1-2 Supported SOP Classes

SOP Class name	SOP Class UID
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

2.1.1 Association Establishment Policies

2.1.1.1 General

The image transfer software will attempt to establish an association each time the Print function is invoked (i.e. for each separate film page). The association is maintained until all images for one film page have been processed.

The maximum PDU (Protocol Data Unit) size allowed is 4096 bytes.

2.1.1.2 Number of Associations

The image transfer software will attempt only one association at a time.

2.1.1.3 Asynchronous Nature

There is no asynchronous activity in this implementation.

2.1.1.4 Implementation Identifying Information

The Implementation UID supplied for DICOM 3.0 associations is "2.16.840.1.113662.5".

2.1.2 Association Initiation By Real World Activity

The image transfer software attempts to initiate an association once each time it is invoked. There is only one Real World Activity that can cause association establishment: Clicking on the <Print> button on the Imprint control panel.

2.1.2.1 Proposed Presentation Contexts

Table 2.1.2.1.2-1 Proposed Presentation Contexts, sending Odyssey image file

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

2.1.2.2 SOP Specific Conformance to Print SOP Classes

If the DICOM print software is unable to open an association with the selected destination AE, an error message is printed in the console window.

At the end of each print attempt, a message is displayed in the console window, which shows whether the print succeeded or failed, and shows the printer status (out of film, etc.).

The print software does not attempt any extended negotiation.

Images are printed using either the Basic Grayscale or Basic Color Print management Meta SOP Class. The following optional elements may be included:

**Table 2.1.2.2-1 Optional Elements for N-CREATE request
 for Basic Film Session SOP Class**

Tag	Name	Conditions for inclusion
[2000,0010]	Number of Copies	Always
[2000,0030]	Medium Type	If supported by SCP and operator does not select "Current".

**Table 2.1.2.2-2 Optional Elements for N-CREATE request
 for Basic Film Box SOP Class**

Tag	Name	Conditions for inclusion
[2010,0040]	Film Orientation	Always*
[2010,0050]	Film Size ID	Always*
[2010,0100]	Border Density	Always
[2010,0120]	Minimum Density	Always*
[2010,0130]	Maximum Density	Always*
[2010,0140]	Trim	Always

**If supported by the print SCP*

**Table 2.1.2.2-3 Optional Elements for N-SET request
 for Basic Grayscale Image Box SOP Class**

Tag	Name	Conditions for inclusion
[2020,0020]	Polarity	Always

**Table 2.1.2.2-4 Optional Elements for N-SET request
 for Basic Color Image Box SOP Class**

Tag	Name	Conditions for inclusion
[2020,0020]	Polarity	Always

**Table 2.1.2.2-5 Optional Elements for N-GET request
 for Printer SOP Class**

Tag	Name	Conditions for inclusion
None		

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The DICOM Print software provides Standard conformance to the DICOM Basic Grayscale Print Management Meta SOP Class and the Basic Color Print Management Meta SOP Class.

The software that provides the user interface to set up films to be printed has been customized to match the capabilities of several popular printers. These are listed in Table 2.1.2.2-6, along with a list of the options that are available for each printer. There is also a generic configuration that should support most other DICOM printers.

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Table 2.1.2.2-6 Printer Options

Printer	Orientation	Format	Max Copies	Density	Film Size	Media Type	Mag Type	Smoothing Type	Window capture allowed
Generic	Portrait	1x1,2x2 2x3,3x3	99	0-10	-	-	-	-	Y
	Land-scape	1x1,2x2 3x2,3x3							
Agfa Drystar 2000	Portrait	1x1,1x2 2x2,2x3 3x3,4x5	99	0-4	-	Current Clear Film Blue Film Paper	Current Replicate Bilinear Cubic	Current 0 140	Y
	Land-scape	1x1,2x1 2x2,3x3							
Codonics NP-1600M	Portrait	1x1,2x2 2x3,3x3	99	1.5-10	-	-	-	-	Y
	Land-scape	1x1,2x2 3x2,3x3							
Imation 8300 Dryview	Portrait	1x1,1x2	99	1.5-3	-	Current Clear Film Blue Film	Current Replicate Cubic None	Current 1,2,3, 4,5,6	N
	Land-scape	1x1,2x1 2x2							
Kodak MLP190	Portrait	1x1,1x2 2x2,2x3 3x3,3x4 4x5	99	0-4	-	-	Current Replicate Bilinear Cubic	Current NORMAL ENHANCED ENHANCED1	Y
	Land-scape	1x1,2x1 2x2,3x2 3x3,4x3 5x4							
Kodak 2180	Portrait	1x1,1x2 2x2,2x3 2x4,3x3 3x4,3x5 4x4,4x5	9	0-3.98	Current 8x10IN 11x14IN 14x17IN	Current Clear Film Blue Film	Current Replicate Bilinear Cubic	NORMAL ENHANCED1	Y
	Land-scape	1x1,2x1 2x2,3x2 4x2,3x3 4x3,5x3 4x4,5x4							

2.1.3 Association Acceptance Policy

The DICOM Print software does not accept associations.

3 Communication Profiles

3.1 Supported Communications Stacks (Parts 8,9)

The DICOM Print software provides DICOM 3.0 TCP/IP Network Communications Support as defined in Part 8 of the DICOM Standard.

3.2 OSI Stack

No OSI stack communications are provided with this implementation.

3.3 TCP/IP Stack

The TCP/IP protocol stack is supported.

3.3.1 Physical media supported

The following media are supported:

- 1) Twisted pair Ethernet
- 2) Thinnet Ethernet
- 3) Thicknet Ethernet

3.4 Point to Point Stack

No point to point stack communications are provided with this implementation.

4 Extensions/Specializations/Privatizations

No extensions, specializations, or privatizations are used in this implementation.

5 Configuration

5.1 AE Title/Presentation Address Mapping

Each remote printer is given a name. This name appears on the list of printers which is presented to the user on the Imprint control panel. Each printer name corresponds to exactly one AE Title/host address pair.

5.2 Configurable Parameters

The following parameters are configurable:

Table 5.2-1 Configuration Parameters

Mode:	Determines the amount of diagnostic messages to be displayed as the images are transmitted.
For each destination:	
Port Number:	Port number on which to communicate with destination AE. The standard DICOM port is 104.
Calling AE Title:	The Odyssey Application Entity Title to use when opening an association with the destination AE.
Called AE Title:	Application Entity Title of destination AE.
Host name:	Host name of remote printer.
Configuration Information	Printer specific configuration information.
Timeout	Maximum time (seconds) to wait for a response from the printer before timing out.

6 Support of Extended Character Sets

Extended Character Sets are not used or supported in this implementation.