

**DICOM Print Class
Conformance Statement
for Digitex PRO**



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Introduction

Picture image equipment for medical examination need to conform to DICOM 3.0 standard. This standard requires defining the service class and information object to be applied to the equipment. This document describes the conformance of DAR-3000 made by Shimadzu Corporation to the print service class of DICOM 3.0 standard. Other medical picture image equipment made by Shimadzu Corporation will not be referred to in this document.

1. Implementation model

This implementation provides for a simple means of image information transfer by using DICOM Basic Gray-scale Print Management Meta SOP Class as a service class user (SCU). The image information transfer from DAR-3000 to the remote printer starts when the operator executes an appropriate function of the general purpose print application.

1.1. Application data flow diagram

The image transfer from DAR-3000 to the remote printer starts when the user has set a manual print in motion or finished an examination with auto-print function.

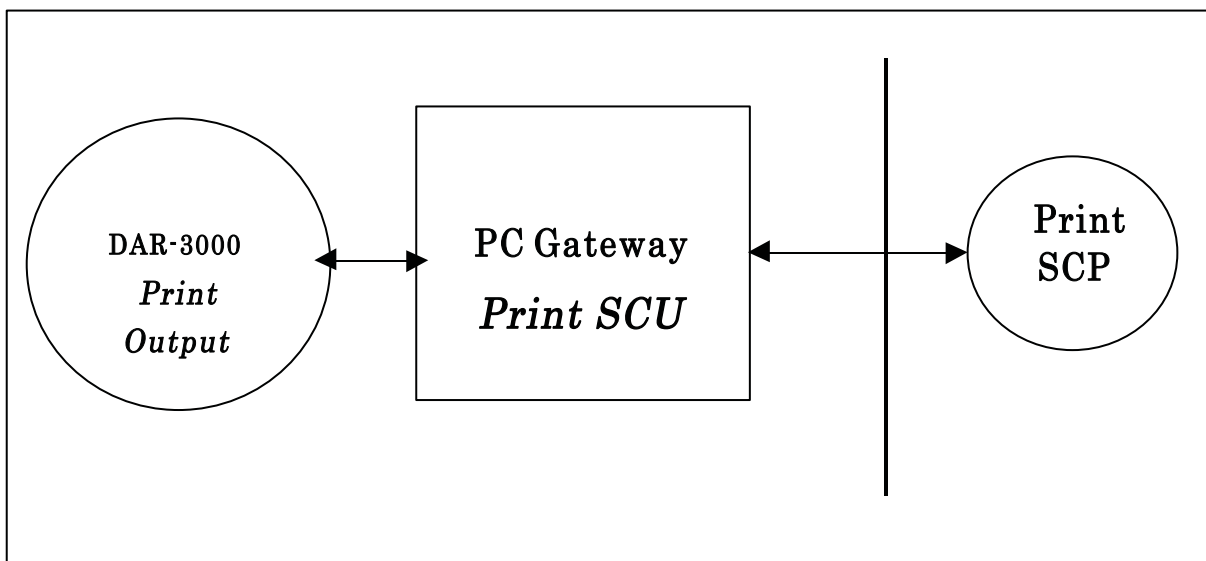


Fig. 1.1-1 Implementation model

1.2. Functional Definition of AE

When the digital video signal of the gray-scale image from the laser imager output application of DAR-3000 outputs to Gateway personal computer, DICOM Print Software starts with the execution of print control.

1.3. Sequencing of Real World Activity

When the operator has executed the laser imager output operation and print operation from the control panel of the DAR-3000, Print SCU starts. At this time an association for film session is established between Remote printer and Gateway PC, and then a film box and image boxes to compose a film page are created and the images are printed out on the film. As soon as printing on the page has finished, the film session is deleted and the association is disengaged. When the printing on the next film page is ready, new association will be established and new film session will be created.

2. AE specification

The operating parameters for DICOM Print AE are given by the configuration files in "RootPath" directory that is specified by "LIECTRL.INI" file in "C:\Winnt" directory and the configuration files in "C:\Option\Print" directory of Gateway PC.

2.1. AE specification

This application entity provides the following SOP Classes with a standard conformance to DICOM 3.0 standard.

Table 2.1-1 Meta SOP Class support

SOP Class name	SOP Class UID	Role
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	SCU

To support this Meta SOP Class as SCU means to support SOP classes that are listed in Table 2.1-2 as well. However, SCU never presents any individual presentation context to these SOP classes.

Table 2.1-2 SOP Class support

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 Gray-Scale Image Box SOP Class	1.2.840.10008.5.1.1.4
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 establishes a new association for every film page. The association is not disengaged until all the images on the film page have been processed.

2.1.1.2 Number of Associations

The image transfer software can support only one association at a time.

2.1.1.3. Asynchronous Nature

Asynchronous activity is not available with this implementation.

2.1.1.4. Implementation Identifying Information

DICOM 3.0 association is identified by the following information:

Implementation UID: 1.2.392.200036.9110.0.7611.1999.9

Application Entity Title: PRSCU

2.1.2 Establishing the association for real World Activity

The image transfer software tries to establish an association when required. One activity can establish only one association, which enables to store images from DAR-3000 to Gateway PC and print out with print control.

If the software fails to establish association, it retries at intervals of 5 seconds as far as Gateway PC is working.

2.1.2.1 Required presentation contexts

Table 2.1.2.1.2-1 Table of required DAR-3000 presentation contexts

Presentation context table					
Abstract context		Transfer context		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

2.1.2.2 SOP Specific Conformance to Print SOP Classes

If DICOM Print Software fails to establish association with a selected AE, an error message will be displayed on the operating panel of DAR-3000.

Images are printed using the basic gray-scale. The following optional elements may be included in some cases.

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

Tag	Name	Applicable situation
[2000,0010]	Number of copies	Always
[2000,0020]	Print priority	Always

**Table 2.1.2.2-2 Optional elements to require
N-CREATE to Basic Film Box SOP Class**

Tag	Name	Applicable situation
[2010,0060]	Magnification Types	At setup time*
[2010,0150]	Configuration Information	At setup time*

***Magnification Types:**

Supplementary types in which printer magnifies images to match them with the sizes of the image boxes on film

Defined term: REPLICATE
 BILINEAR
 CUBIC
 NONE

***Configuration Information**

An ID of printer configuration table including a set of print parameters particular to the implementation (parameters related to perception LUT, for example) or a character string including any of configuration data that are encoded for characters.

If more than one encoded configuration data are included in a character string, they are separated each other with backward slashes. Definitions of the data are included in the Conformance Statement of SCP.

DICOM Print Software provides DICOM Basic Gray-Scale Print Control Meta SOP Class with a standard Conformity to DICOM 3.0 standard.

2.1.3 Association acceptance policy

DICOM Print Software does not accept any association request.

3 Communication profile

3.1 Supported communication stack (PS3.8 and PS3.9)

DICOM Print Software, specified in Part 8 of DICOM standard, provides DICOM with 3.0 TCP/IP Network Communication support.

3.2 OSI Stack

This implementation does not support OSI communication.

3.3 TCP/IP Stack

This implementation supports TCP/IP protocol stack.

3.3.1 Physical media support

This implementation supports:

Twisted pair Ethernet

3.4 Point to Point Stack

This implementation is not provided with point to point stack communication.

4. Extension, specialization and privatization

This implementation does not use the extension, specialization and privatization.

5. Configuration

5.1 Correspondence between AE name and presentation address

Each remote printer is given its name. This name is saved in a setting file in Gateway PC.

Each printer name corresponds to a pair of AE title and the host address.

5.2 Configurable parameters

Following parameters are configurable:

Table 5.2-1 Configuration parameters

Parameter for each purpose:	
Port Number	Port number for data transmission to destination AE
Called AE Title	Application entity title of destination AE
Host name	Host name of remote printer
Magnification type	Interpolating method for image magnification
Configuration information	Special configuration information for printer