



Technical Publications

**Direction 2272968-100
Revision 0**

DATAFLASH RISLINK SERVER V1.07 CONFORMANCE STATEMENT for DICOM V3.0

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GE Medical Systems

REVISION HISTORY

REV	DATE	REASON FOR CHANGE
0	10-Apr-2000	Initial release

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1 INTRODUCTION

1.0 OVERVIEW

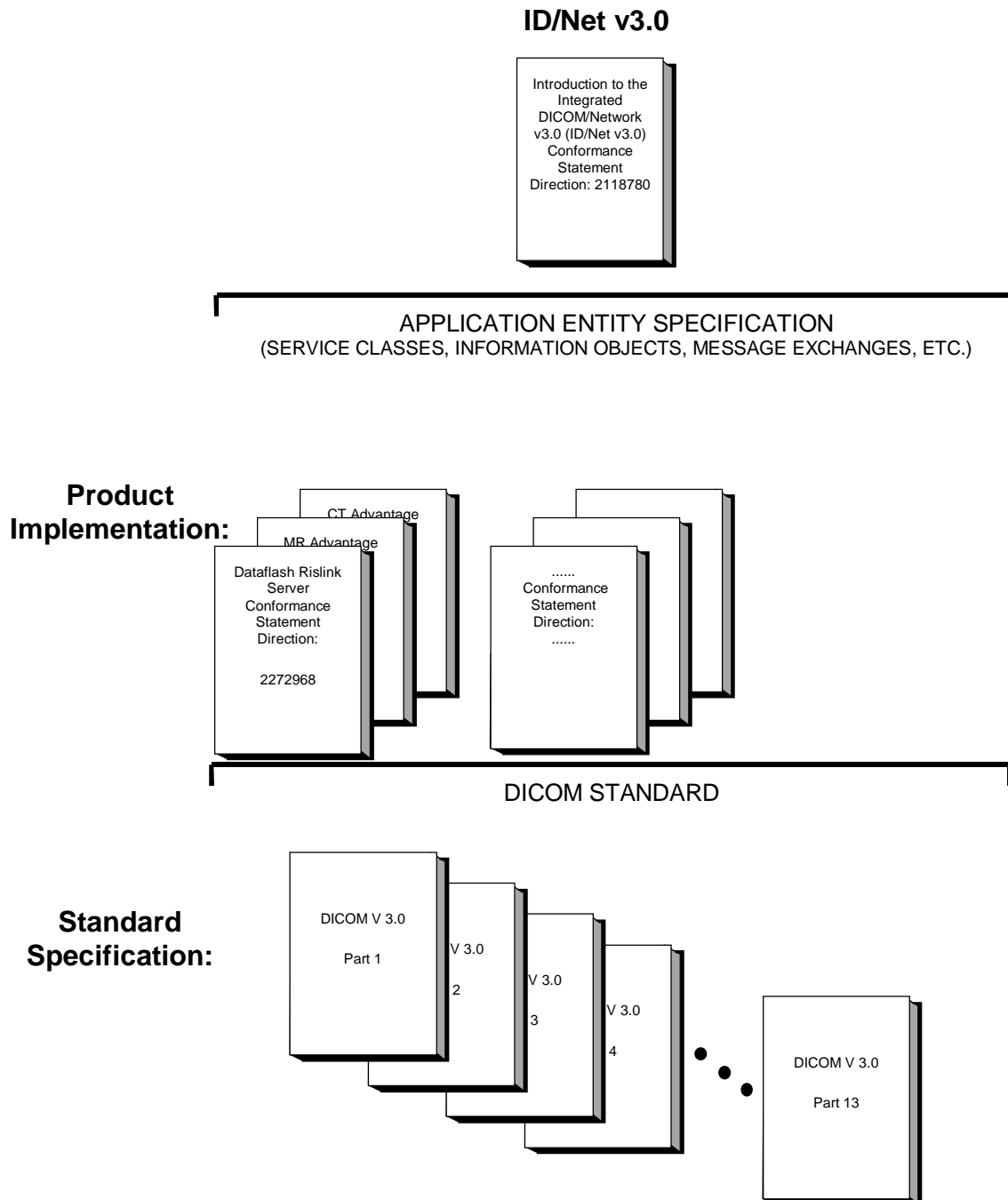
This DICOM Conformance Statement is divided into Sections as described below:

Section 1 (Introduction), which describes the overall structure, intent, and references for this Conformance Statement

Section 2 (Network Conformance Statement), which specifies the GEMS equipment compliance to the DICOM requirements for the implementation of Networking features.

1.1 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT STRUCTURE

The Documentation Structure of the GEMS Conformance Statements and their relationship with the DICOM v3.0 Conformance Statements is shown in the Illustration below.



This document specifies the DICOM v3.0 implementation. It is entitled:

Dataflash Rislink Server 1.07
Conformance Statement for DICOM v3.0
Direction 2272968-100 Rev 0

This DICOM Conformance Statement documents the DICOM v3.0 Conformance Statement and Technical Specification required to interoperate with the GEMS network interface. Introductory information, which is applicable to all GEMS Conformance Statements, is described in the document:

Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
Conformance Statement
Direction: 2118780.

This Introduction familiarizes the reader with DICOM terminology and general concepts. It should be read prior to reading the individual products' GEMS Conformance Statements.

The GEMS Conformance Statement, contained in this document, also specifies the Lower Layer communications which it supports (e.g., TCP/IP). However, the Technical Specifications are defined in the DICOM v3.0 Part 8 standard.

For more information including Network Architecture and basic DICOM concepts, please refer to the Introduction.

For the convenience of software developers, there is "collector" Direction available. By ordering the collector, the Introduction described above and all of the currently published GEMS Product Conformance Statements will be received. The collector Direction is:

ID/Net v3.0 Conformance Statements
Direction: 2117016

For more information regarding DICOM v3.0, copies of the Standard may be obtained by written request or phone by contacting:

NEMA Publication
1300 North 17th Street
Suite 1847
Rosslyn, VA 22209
USA
Phone: (703) 841-3200

1.2 INTENDED AUDIENCE

The reader of this document is concerned with software design and/or system integration issues. It is assumed that the reader of this document is familiar with the DICOM v3.0 Standards and with the terminology and concepts which are used in those Standards.

If readers are unfamiliar with DICOM v3.0 terminology they should first refer to the document listed below, then read the DICOM v3.0 Standard itself, prior to reading this DICOM Conformance Statement document.

Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
Conformance Statement
Direction: 2118780

1.3 SCOPE AND FIELD OF APPLICATION

It is the intent of this document, in conjunction with the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*, to provide an unambiguous specification for GEMS implementations. This specification, called a Conformance Statement, includes a DICOM v3.0 Conformance Statement and is necessary to ensure proper processing and interpretation of GEMS medical data exchanged using DICOM v3.0. The GEMS Conformance Statements are available to the public.

The reader of this DICOM Conformance Statement should be aware that different GEMS devices are capable of using different Information Object Definitions. For example, a GEMS CT Scanner may send images using the CT Information Object, MR Information Object, Secondary Capture Object, etc.

Included in this DICOM Conformance Statement are the Module Definitions which define all data elements used by this GEMS implementation. If the user encounters unspecified private data elements while parsing a GEMS Data Set, the user is well advised to ignore those data elements (per the DICOM v3.0 standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a "full fidelity storage device", it should retain and re-transmit all of the private data elements which are sent by GEMS devices.

1.4 IMPORTANT REMARKS

The use of these DICOM Conformance Statements, in conjunction with the DICOM v3.0 Standards, is intended to facilitate communication with GE imaging equipment. However, **by itself, it is not sufficient to ensure that inter-operation will be successful.** The **user (or user's agent)** needs to proceed with caution and address at least four issues:

- **Integration** - The integration of any device into an overall system of interconnected devices goes beyond the scope of standards (DICOM v3.0), and of this introduction and associated DICOM Conformance Statements when interoperability with non-GE equipment is desired. The responsibility to analyze the applications requirements and to design a solution that integrates GE imaging equipment with non-GE systems is the **user's** responsibility and should not be underestimated. The **user** is strongly advised to ensure that such an integration analysis is correctly performed.
- **Validation** - Testing the complete range of possible interactions between any GE device and non-GE devices, before the connection is declared operational, should not be overlooked. Therefore, the **user** should ensure that any non-GE provider accepts full responsibility for all validation required for their connection with GE devices. This includes the accuracy of the image data once it has crossed the interface between the GE imaging equipment and the non-GE device and the stability of the image data for the intended applications.

Such a validation is required before any clinical use (diagnosis and/or treatment) is performed. It applies when images acquired on GE imaging equipment are processed/displayed on a non-GE device, as well as when images acquired on non-GE equipment is processed/displayed on a GE console or workstation.

- **Future Evolution** - GE understands that the DICOM Standard will evolve to meet the user's growing requirements. GE is actively involved in the development of the DICOM v3.0 Standard. DICOM v3.0 will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEMS protocol is based on DICOM v3.0 as specified in each DICOM

Conformance Statement. Evolution of the Standard may require changes to devices which have implemented DICOM v3.0. **In addition, GE reserves the right to discontinue or make changes to the support of communications features (on its products) reflected on by these DICOM Conformance Statements.** The **user** should ensure that any non-GE provider, which connects with GE devices, also plans for the future evolution of the DICOM Standard. Failure to do so will likely result in the loss of function and/or connectivity as the DICOM Standard changes and GE Products are enhanced to support these changes.

- **To be informed of the evolution of the implementation described in this document, the User is advised to regularly check the GE Internet Server, accessible via anonymous ftp (GE Internet Server Address: ftp.med.ge.com, 192.88.230.11).**
- **Interaction** - It is the sole responsibility of the **non-GE provider** to ensure that communication with the interfaced equipment does not cause degradation of GE imaging equipment performance and/or function.

1.5 REFERENCES

A list of references which is applicable to all GEMS Conformance Statements is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.*

The information object implementation refers to DICOM PS 3.3 (Information Object Definition).

1.6 DEFINITIONS

A set of definitions which is applicable to all GEMS Conformance Statements is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.*

1.7 SYMBOLS AND ABBREVIATIONS

A list of symbols and abbreviations which is applicable to all GEMS Conformance Statements is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.*

2 NETWORK CONFORMANCE STATEMENT

2.0 IMPLEMENTATION MODEL

Dataflash Rislink Server is a PC Windows based software package to work with one or more Dataflash products. It is designed to allow users to identify the Mammography film, retrieving patient demographic information by means of a worklist or entered manually.

2.0.1 Application Data Flow Diagram

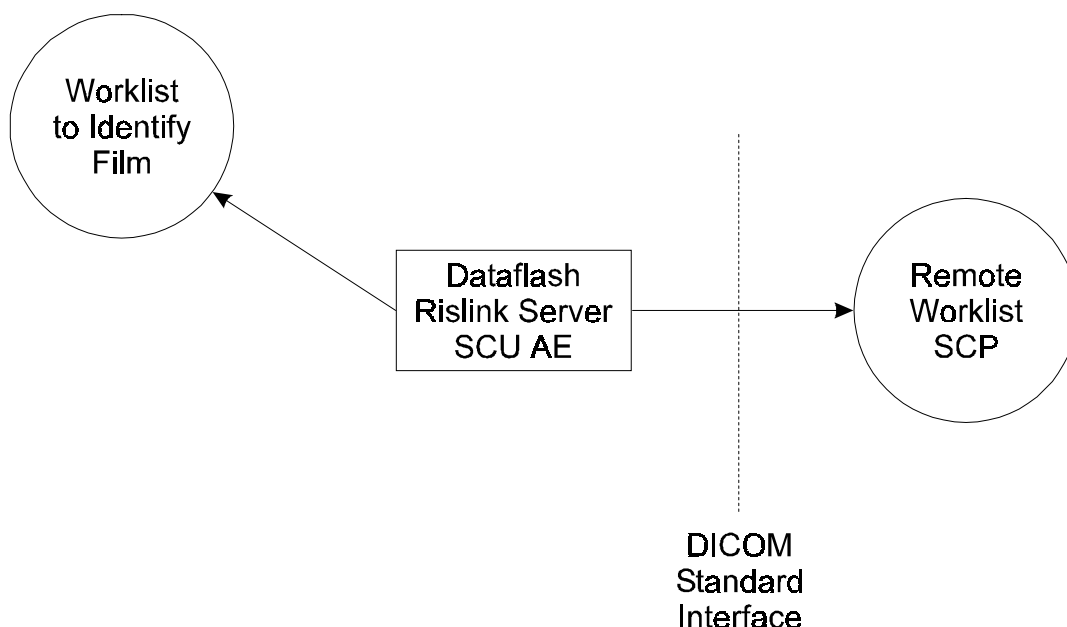


FIGURE 2.1 IMPLEMENTATION MODEL.

2.0.2 Functional Definitions of AEs

Dataflash Rislink Server is implemented as a single application entity as a Service Class User for requesting demographic information. The DICOM C-Find Modality Worklist Service is used to retrieve demographic information.

- > Create a DICOM basic worklist management data request.
- > Initiate a DICOM association to send the request.
- > Issue a C-Find request.
- > Wait for the worklist responses.
- > Access the local database to update the patient demographic data.
- > Close the Association.

2.0.3 Sequencing of Real World Activities

Dataflash Rislink Server must have an installed/working connection with a suitable SCP. Query criterion is default configured into the appropriate fields and the query command is given.

2.1 AE SPECIFICATIONS

2.1.1 Services Used by Dataflash Rislink Server as SCU

Dataflash Rislink Server provides Standard Conformance to the following DICOM V3.0 **Management** SOP Class as an SCU:

SOP Class	SOP Class UID
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31

TABLE.1 SOP CLASSE.

2.1.2 Association Establishment Policies

2.1.2.1 General

The DICOM Application Context Name, which is always proposed, is:

- > DICOM 3.0 Application Context: **1.2.840.10008.3.1.1.1**

Dataflash Rislink Server AE supports a maximum PDU size of 65542 bytes.

The maximum length PDU is not configurable.

Dataflash Rislink Server will attempt to establish an association whenever it is invoked via the refresh button in the user interface, and/or after a time interval, as set in the configuration.

Only Dataflash Rislink Server shall release an Association. Dataflash Rislink Server or the SCP AE may abort the Association.

2.1.2.2 Number of Associations

Dataflash Rislink Server will attempt only one association establishment at a time.

2.1.2.3 Asynchronous Nature

Dataflash Rislink Server allows a single outstanding operation on any association. Therefore, Dataflash Rislink Server does not support asynchronous operations window negotiation.

However, the Dataflash Rislink Server Worklist Management Component may cancel the C-FIND service by issuing a C-CANCEL-FIND request at any time during processing of the C-FIND service by the SCP AE.

2.1.2.4 Implementation Identifying Information

Dataflash Rislink Server provides the following implementation identifying parameters:

- > Implementation Class UID: 1.3.51.0.1.3
- > Implementation Version Name: **AGFA DTF1.0.43**

2.1.2.5 Association Initiation Policy

Dataflash Rislink Server attempts to initiate a new association for every query.

2.1.2.6 Called/Calling AE Titles

The calling AE title and the called AE title that Dataflash Rislink Server will use are configurable after application startup.

2.1.2.7 Association Initiation by Real World Activity

The Dataflash Rislink Server AE attempts to initiate a new association due to two Real-World activities:

- > Worklist oriented query manually initiated by the operator.
- > Worklist oriented query automatically initiated at a configured time interval.

Although there are two different real world activities that can begin a DICOM Worklist query, the DICOM association initiation and transfer process is identical.

2.1.2.7.1 Associated Real World Activity - Modality Worklist Management

The Real World activity associated with the C-FIND operation is the response of the SCP and the creation of a worklist on the Dataflash Rislink Server, this worklist is send to the respective Dataflash ID-camera, wherefrom a patient can be selected to identify the film.

2.1.2.7.2 Proposed Presentation Contexts

Dataflash Rislink Server proposes the presentation context listed in Table 2.

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table.1	See Table.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None

TABLE 2 PRESENTATION CONTEXTS.

2.1.2.7.3 SOP Specific Conformance - Modality Worklist Management

2.1.2.7.3.1 Worklist Oriented Selection

Dataflash Rislink Server provides standard conformance to the DICOM Basic **Worklist Management** Service Class. Dataflash Rislink Server requests the following matching key types for the Worklist Oriented Selection:

Matching Key Types	
SV	Single value match
SM	Sequence Matching

Dataflash Rislink Server requests the following elements for this SOP class:

Module	Attribute Name	Tag	Match
SOP Common	Specific Character Set	(0008,0005)	Zero-length
Scheduled Procedure Step	Scheduled Procedure Step Sequence	(0040,0100)	SM
	> Scheduled Station AE Title	(0040,0001)	SV (see Note)
	> Scheduled Procedure Step Start Date	(0040,0002)	TODAY
	> Scheduled Procedure Step Start Time	(0040,0003)	Zero length
	> Modality	(0008,0060)	Zero length
	> Scheduled Performing Phys. Name	(0040,0006)	Zero-length
	> Scheduled Procedure Step Description	(0040,0007)	Zero-length
	> Scheduled Station Name.	(0040,0010)	Zero-length
	> Scheduled Procedure Step Location.	(0040,0011)	Zero-length

Module	Attribute Name	Tag	Match
	> Scheduled Action Item Code Sequence	(0040,0008)	SM with Zero length item
	>> Code Value	(0008,0100)	---
	>> Code Scheme Designator	(0008,0102)	---
	>> Code Meaning	(0008,0104)	---
	> Pre-Medication.	(0040,0012)	Zero-length
	> Scheduled Procedure Step ID.	(0040,0009)	Zero-length
	> Requested Contrast Agent	(0032,1070)	Zero-length
	> Scheduled Procedure Step Status	(0040,0020)	Zero-length
Requested Procedure	Requested Procedure ID	(0040,1001)	Zero-length
	Requested Procedure Description	(0032,1060)	Zero-length
	Requested Procedure Code Sequence	(0032,1064)	SM with Zero-length item
	> Code Value	(0008,0100)	--
	> Coding Scheme Designator	(0008,0102)	--
	> Code Meaning	(0008,0104)	--
	Study Instance UID	(0020,000D)	Zero-length
	Referenced Study Sequence	(0008,1110)	SM with Zero-length item
	> Referenced SOP Class UID	(0008,1150)	--
	> Referenced SOP Instance UID	(0008,1155)	--
	Requested Procedure Priority	(0040,1003)	Zero-length
	Patient Transport Arrangements	(0040,1004)	Zero-length
	Reason for the Requested Procedure	(0040,1002)	Zero-length
Imaging Service Request	Accession Number	(0008,0050)	Zero-length
	Requesting Physician	(0032,1032)	Zero-length
	Referring Physician's Name	(0008,0090)	Zero-length
Visit Identification	Admission ID	(0038,0010)	Zero-length
Visit Status	Current Patient Location	(0038,0300)	Zero-length
Visit Relationship	Referenced Patient Sequence	(0008,1120)	SM with Zero-
	> Referenced SOP Class UID	(0008,1150)	--
	> Referenced SOP Instance UID	(0008,1155)	--
	Referenced Study Sequence	(0008,1110)	SM with Zero-
	> Referenced SOP Class UID	(0008,1150)	--
	> Referenced SOP Instance UID	(0008,1155)	--
Visit Admission	Referring Physician's Name	(0008,0090)	Zero-length
Patient Relationship	Referenced Study Sequence	(0008,1110)	SM with Zero-length item
	> Referenced SOP Class UID	(0008,1150)	--
	> Referenced SOP Instance UID	(0008,1155)	--
Patient Identification	Patient's Name	(0010,0010)	Zero-length
	Patient ID	(0010,0020)	Zero-length
	Other Patient Ids	(0010,1000)	Zero-length
Patient Demographic	Patient's Birth Date	(0010,0030)	Zero-length
	Patient's Sex	(0010,0040)	Zero-length
	Patient's Weight	(0010,1030)	Zero-length
	Confidentiality Constraint on Patient Data	(0040,3001)	Zero-length
	Patient's Size	(0010,1020)	Zero-length
	Ethnic Group	(0010,2160)	Zero-length
	Occupation	(0010,2180)	Zero-length
Patient Medical	Patient State	(0038,0500)	Zero-length
	Pregnancy Status	(0010,21C0)	Zero-length
	Medical Alerts	(0010,2000)	Zero-length

Module	Attribute Name	Tag	Match
	Contrast Allergies	(0010,2110)	Zero-length
	Special Needs	(0038,0050)	Zero-length
	Additional Patient History	(0010,21B0)	Zero-length

TABLE 2 MODALITY WORKLIST INFORMATION MODEL ATTRIBUTES.

Note:

AE-Title of the Dataflash ID-camera (note that this is different than the AE-title of the Dataflash Rislink Server).

2.1.2.7.4 Information on Film

The Dataflash ID-camera is equipped with an exposure window that can be loaded with information. This information is obtained from the worklist.

The layout of the exposure window and the type of information to be exposed are completely configurable via the user interface.

2.1.2.7.5 Status Codes Processed when Receiving Messages from a Modality Worklist SCP

Service Status	Further Meaning	Status Codes	Dataflash Rislink Server Behavior
Refused	Out of Resources	A700	Note 1
Failed	Identifier Does Not Match SOP Class	A900	Note 1
	Unable to Process	C000	Note 1
	Unable to Process	Cxxx	Note 2
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete – No final Identifier is supplied	0000	None
Pending	Matches are continuing – Current Match is supplied and any optional Keys were supported in the same manner as Required keys	FF00	None
	Matches are continuing – Warning that one or more Optional Keys were not supported for existence for this Identifier	FF01	None

TABLE 3 C-FIND RESPONSE STATUS.

Notes:

1. No warning or error message on the user interface of the Dataflash Rislink Server or ID camera. In the Report Viewer, the Status Code and Further Meaning will be logged.
2. Same as Note 1, but only Status Code will be logged in decimal notation.

2.2 COMMUNICATION PROFILES

2.2.1 Supported Communications Stacks.

Dataflash Rislink Server provides DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the DICOM Standard.

2.2.2 TCP/IP Stack

Dataflash Rislink Server inherits its TCP/IP stack from the computer system upon which it executes.

2.2.3 Physical Medium Support

Dataflash Rislink Server is indifferent to the physical medium over which TCP/IP operates.

2.3 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

Because of IHE constraints, two additional tags are added to the Worklist request:

Module	Attribute Name	Tag	Match
Imaging Service Request	Placer Order Number / Imaging Service Request	(0040,2016)	Zero length
	Filler Order Number / Imaging Service Request	(0040,2017)	Zero length

2.4 CONFIGURATION

2.4.1 Configurable Parameters

The following parameters are configurable for this AE:

2.4.1.1 Via the Windows control panel

Local IP Address, Netmask and Gateway

2.4.2 AE Title/Presentation Address Mapping

2.5 SUPPORT FOR EXTENDED CHARACTER SETS

Dataflash Rislink Server is known to support the following character sets:

- ISO-IR 100 Latin Alphabet No. 1

Notes:

The current Dataflash (software V3.30) does not support the ISO-IR 100.

2.6 ACRONYMS AND ABBREVIATIONS

The following acronyms and abbreviations are used in this document:

ACR	American College of Radiology
AE	Application Entity
DICOM	Digital Imaging and Communications in Medicine
IHE	Integrating the Healthcare Enterprise
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
SCP	Service Class Provider
SCU	Service Class User
SCP	Service Class Provider
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier

