



DICOM

Conformance Statement

Allegro™ and Gemini™ Systems

PHILIPS

1 DICOM CONFORMANCE STATEMENT OVERVIEW

1.1 INTRODUCTION

This DICOM Conformance Statement applies to Gemini systems using software releases 1.1 and 8.1.4. This statement also applies to Allegro systems using software release 8.1.4 software.

1.2 STORAGE SOP CLASSES

All storage SOP Classes in [Table 1-1](#) are supported.

Table 1-1: Network and Print Services

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Instance Transfer		
Computed Tomography (CT) Image Storage	Yes	Stored and Viewed
Magnetic Resonance (MR) Image Storage	Yes	Stored and Viewed
Secondary Capture Image Storage	Yes	No
Nuclear Medicine (NM) Image Storage	Yes	Stored and Viewed
Positron Emission Tomography (PET) Image Storage	Yes	Stored and Viewed
Print		
Basic Grayscale Print Management	Yes	No
Basic ColorPrint	Yes	No

1.3 ACRONYMS AND ABBREVIATIONS

Table 1-2: Common Acronyms and Abbreviations

ACR	American College of Radiology
AE	Application Entity
ANSI	American National Standards Institute
DICOM	Digital Imaging and Communication in Medicine
DIMSE-C	DICOM Message Service Element-Composite
DIMSE-N	DICOM Message Service Element-Normalized
IOD	Information Object Definition
ISO	International Standards Definition
NEMA	National Electrical Manufacturers Association
OSI	Open Systems Interconnections
PDU	Protocol Data Unit
SCP	Service Class Provider (server)
SCU	Service Class User (client)
TCP/IP	Transmission Control Protocol/Internet Protocol
SOP	Service Object Pair
UID	Unique Identification

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3 INTRODUCTION

3.1 REVISION HISTORY

Table 3-1: Revision History

Document Version	Date of Issue	Description
Rev. A November, 2003	November, 2003	Complete rewrite and reorganization of Statement to reflect new NEMA formatting and organizational guidelines.

3.2 REMARKS

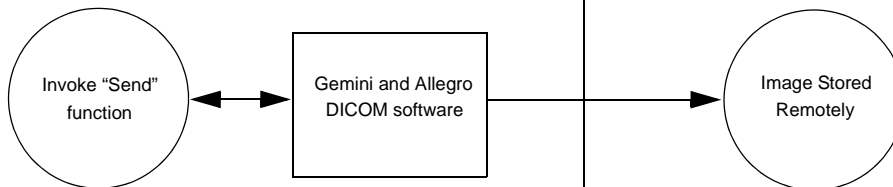
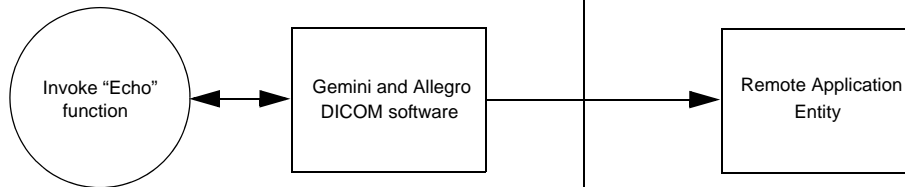
Not applicable.

4 NETWORKING

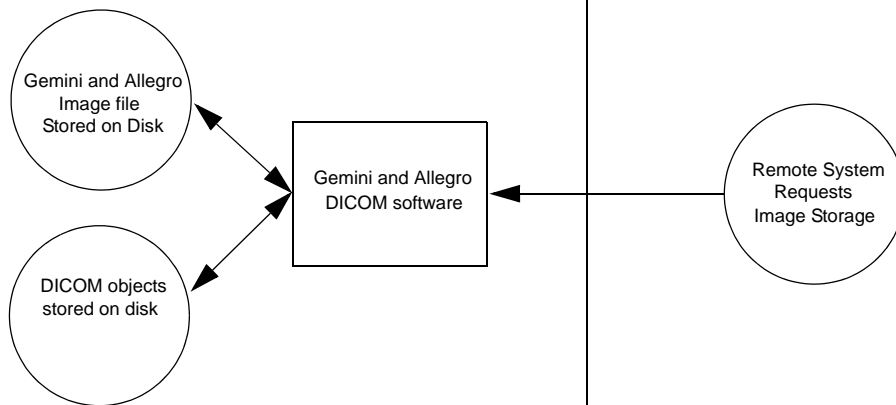
4.1 IMPLEMENTATION MODEL

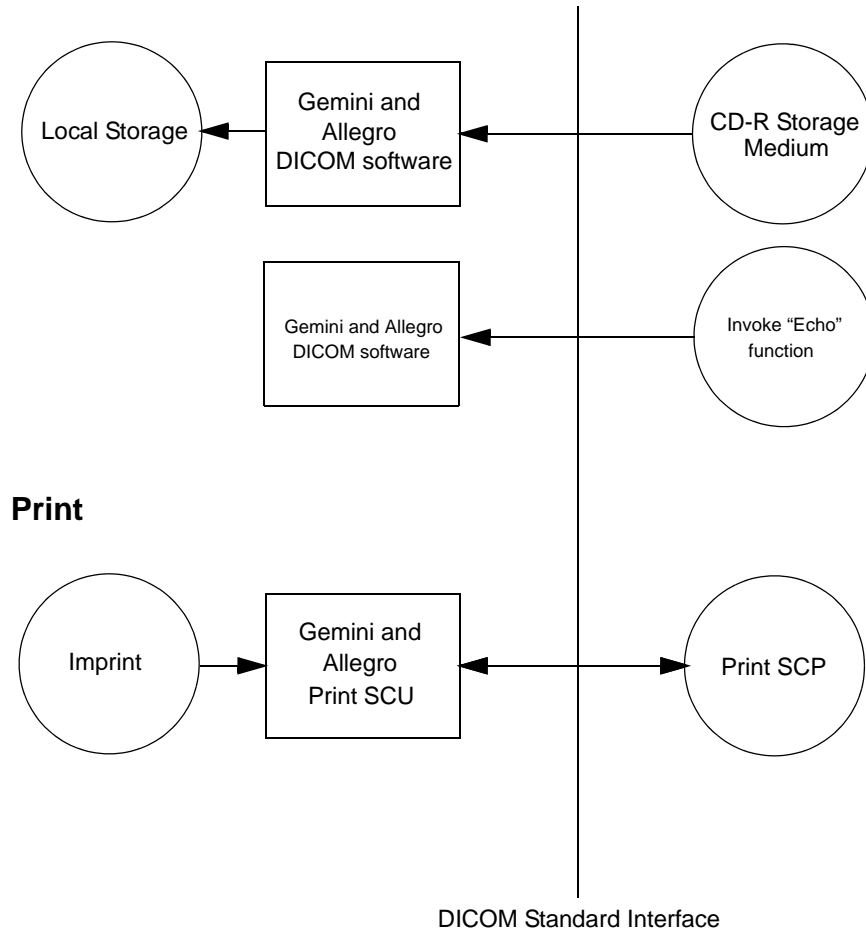
4.1.1 Application Data Flow

Export



Import





Print

This implementation provides for simple transfer of PET, CT, NM, and MR images using the DICOM Storage Service Class as both a Service Class User (SCU) and a Service Class Provider (SCP). Transfers from the Allegro and Gemini to a remote Application Entity (AE) are initiated by an operator by selecting the appropriate options from the File Manager. No operator action is required on the Gemini and Allegro to service Storage requests initiated by a remote Application Entry (AE).

For diagnostic purposes, this implementation also provides for simple communication testing using the DICOM Verification Service Class, as both SCU and SCP. Verification of communications to a remote AE is initiated by an operator by clicking Test Connection on the DICOM Export window. Verification of communications from a remote AE is handled automatically and requires no operator actions.

4.1.2 Functional Definitions as AEs

4.1.2.1 Import Server (ECHO-SCP and STORAGE-SCP)

The Import Server waits in the background for a connection. It will accept Presentation Contexts for SOP Classes of the Verification Service Class, and will respond to echo requests.

It will also accept associations with Presentation Contexts for SOP Classes of the Storage Service Class, and will store the received images to the local database where they may subsequently be listed and viewed through the user interface.

4.1.2.2 Export (ECHO-SCU and STORAGE-SCU)

The Test Connection function provides an easy way to determine if the remote AE is available. When Test Connection is pressed, an association which includes a Presentation Context for Verification Class is proposed. A successful response indicates that the remote AE is available. The association is immediately closed.

DICOM Export is activated through File Manager when a user selects image files from the local database and requests that they be sent to a remote AE (selected from a pre-configured list).

4.1.2.3 Print (PRINT-SCU)

The Print function is available from within several processing functions.

It prints to a DICOM-compatible network color printer or film imager using an implementation of the SCU role of DICOM Print Management Class. It does this in the following way:

1. It uses N-GET to request the printer status information.
2. It starts a film session and film box and sets the attributes of an image/annotation box in the background according to the format defined by the application.
3. It sends pixels/LUT data to the service provider.
4. It requests printing of a single film session.

It will request cancellation of printing per user request.

4.1.2.4 Snapshot Image Export (Secondary Capture STORAGE-SCU)

This function is available from several image processing applications on the PETView. It exports screen capture images using the Secondary Capture Storage SOP Class as a SCU.

4.1.3 Sequencing of Real-World Activities

All SCP (Import Server) activities are performed asynchronously in the background and are not dependent on any sequencing.

All SCU (Export, Print, and Snapshot Image Export) activities are initiated using File Manager or a specific application. Once initiated, they do not interact and operate asynchronously.

4.2 AE SPECIFICATIONS

4.2.1 Import Server (ECHO-SCP and STORAGE-SCU)

4.2.1.1 SOP Classes

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

Table 4-1: SOP Classes Supported by Import Server

SOP Class Name	SOP Class UID	Conformance	Role
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Standard	SCP
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Standard	SCP
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	Standard	SCP
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	Standard	SCP
Verification	1.2.480.10008.1.1	Standard	SCP

4.2.1.2 Association Policies

4.2.1.2.1 General

The server does not initiate associations.

The import server software waits for another application to connect at the presentation address configured for its Application Entity Title. The application that connects must be a DICOM application. Associations are accepted with Presentation Contexts for SOP Classes of the Storage Service Class, or the Verification Service Class. It will receive images on the Storage Service Class Presentation Contexts and create Gemini or Allegro image files from them. It also stores a complete copy of the

original DICOM message. This feature allows such images to be retransmitted exactly as they were received.

Table 4-2: Maximum PDU Size Received as a SCP for Import Server

Maximum PDU size received	32 KB
---------------------------	-------

NOTE: This option is configurable.

Images can be read from a CD-R. Only CT, MR, NM, PET, and SC SOP Instances can be read. You can do this manually using the *import_dicom_file* script.

4.2.1.2.2 Number of Associations

Table 4-3: Number of Associations as a SCP for Import Server

Maximum number of simultaneous associations	Unlimited
---	-----------

The Import Server AE will spawn a separate process for each connection that is established.

4.2.1.2.3 Asynchronous Nature

Import Server will only allow a single outstanding operation on an Association. Therefore, the import server will not perform asynchronous operations.

4.2.1.2.4 Implementation Identifying Information

Table 4-4: DICOM Implementation Class for Import Server

Implementation Class UID	1.3.46.670589.28
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4.2.1.2.5 Association Initiation Policy

Import Server does not initiate associations.

4.2.1.3 Association Acceptance Policy

When Import Server accepts an association, it will respond to either echo requests or storage requests. If the Called AE Title does not match the pre-configured AE Title for the import server, the association will be rejected.

4.2.1.3.1 Activity - Receive Echo Request

4.2.1.3.1.1 Description and Sequencing of Activities

When a Verification (C-ECHO) request is successfully received, it responds with a successful received message. When images are received, they are copied to the local file system, converted to PETView image files, and entered into the database. If the image received is a duplicate of a previously received instance, the old file and the database record will be overwritten with the new one.

4.2.1.3.1.2 Accepted Presentation Contexts

Table 4-5: Acceptable Presentation Contexts for Import Server Request

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verifica- tion	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CT Image	1.2.840.10008.5.1.4. 1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
MR Image	1.2.840.10008.5.1.4. 1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
NM Image	1.2.840.10008.5.1.4. 1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Table 4-5: Acceptable Presentation Contexts for Import Server Request

PET Image	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

4.2.1.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

4.2.1.3.1.3 SOP Specific Conformance

4.2.1.3.1.3.1 SOP Specific Conformance to Verification SOP and Storage Classes

Import Server provides standard conformance to the Verification Service and supported Storage Service Classes.

4.2.1.3.1.3.2 Presentation Context Acceptance Criterion

Import Server will always accept a Presentation Context for the supported SOP Classes with the supported Transfer Syntaxes. More than one proposed Presentation Context will be accepted for the same Abstract Syntax if the Transfer Syntax is supported.

4.2.1.3.1.3.3 Transfer Syntax Selection Policies

Import Server accepts the Transfer Syntaxes listed in [Table 4-5](#). If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

- a. Explicit VR Little Endian, if accepted
- b. Explicit VR Big Endian, if accepted
- c. Default Transfer Syntax

Import Server will accept duplicate Presentation Contexts, that is, if it is offered multiple Presentation Contexts, each of which offers acceptable Transfer Syntaxes, it will accept all Presentation Contexts, applying the same priority for selecting a Transfer Syntax for each.

4.2.2 EXPORT (ECHO-SCU and Storage-SCU)

4.2.2.1 SOP Classes

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

Table 4-6: SOP Classes Supported by Export

SOP Class Name	SOP Class UID	Conformance	Role
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Standard	SCU
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Standard	SCU
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	Standard	SCU
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	Extended	SCU
Verification	1.2.480.10008.1.1	Standard	SCU

4.2.2.2 Association Establishment Policies

4.2.2.2.1 General

The DICOM Send (Export) application will attempt to establish an association each time any of its functions (Send and Test Destination) are invoked. When sending images, the association is maintained until all selected image files have been processed. Those files which cannot be transferred because the receiving AE does not support the required SOP Class are ignored.

When sending the verification (Test Destination) request, the association is immediately closed as soon as the response is received. Each new request is made on a new association.

Table 4-7: Maximum PDU Size Received as a SCU for Export

Maximum PDU size received	4, 8, 16, or 32 KB
---------------------------	--------------------

NOTE: This option is configurable.

4.2.2.2.2 Number of Associations

The DICOM Send (Export) application will initiate only one association at a time. However, since there can be more than one File Manager, it is possible for multiple copies to be invoked simultaneously. There is no synchronization attempted between multiple copies of the transfer software, so there may be a number of associations attempted simultaneously, limited only by the resources available.

Table 4-8: Number of Associations as a SCU for Export

Maximum number of simultaneous associations	Unlimited
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4.2.2.2.3 Asynchronous Nature

There is no asynchronous activity in this implementation.

4.2.2.2.4 Implementation Identifying Information

Table 4-9: DICOM Implementation Class for Export

Implementation Class UID	1.3.46.670589.28
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4.2.2.3 Association Initiation Policy

The DICOM Send (Export) application initiates an association each time someone clicks the **Export** or **Test Connection** buttons.

4.2.2.4 Association Acceptance Policy

DICOM Send (Export) application does not accept associations.

4.2.2.4.1 Activity - Export (ECHO-SCU and STORAGE-SCU)

4.2.2.4.1.1 Description and Sequencing of Activities

The Associated Real World Activity is the attempt to transfer a set of images. This occurs when the operator manually selects a set of images from File Manager and exports them using the DICOM Send (Export) function.

4.2.2.4.1.2 Proposed Presentation Contexts

Table 4-10: Proposed Presentation Contexts for Export

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
CT Image	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
MR Image	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
NM Image	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
PET Image	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

4.2.2.4.1.2.1 Extended Negotiation

Extended negotiation is not applicable.

4.2.2.4.1.3 SOP Specific Conformance

4.2.2.4.1.3.1 SOP Specific Conformance to Verification and Storage SOP Class

In the DICOM Export window, text appears next to each file listed indicating the transmission progress.

After the image file is sent, the “In Progress” status changes to “Done”.

The word Failed will appear next to all the files if the DICOM Send (Export) application:

- is unable to determine the appropriate Abstract Syntax for a file
- detects that the Abstract Syntax is not supported by the receiving AE
- receives a failed, refused, or warning response to the C-STORE operation

The image transfer software does not attempt any extended negotiation.

4.2.2.4.1.3.2 Presentation Context Acceptance Criterion

DICOM Send (Export) does not accept associations.

4.2.2.4.1.3.3 Transfer Syntax Selection Policies

If the receiving system accepts more than one Transfer Syntax for any of the proposed Presentation contexts, then the DICOM Send (Export) application will select one using the following criterion:

- a. Explicit VR Little Endian, if accepted
- b. Explicit VR Big Endian, if accepted
- c. Implicit VR Little Endian

4.2.3 Print (PRINT-SCU)

4.2.3.1 SOP Classes

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

Table 4-11: Support SOP Classes

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

4.2.3.2 Association Establishment Policies

4.2.3.2.1 General

Table 4-12: Maximum PDU Size Received as a SCP for Print

Maximum PDU size received	32 KB
---------------------------	-------

NOTE: This option is configurable.

4.2.3.2.2 Number of Associations

Table 4-13: Number of Associations as a SCP for Print

Maximum number of simultaneous associations	Unlimited
---	-----------

NOTE: This is configurable.

The Print software will initiate only one association at a time. However, since there can be more than one File Manager or application, it is possible for multiple copies to be invoked simultaneously. There is no synchronization attempted between multiple copies of the print software, so there may be a number of associations attempted simultaneously, limited only by the resources available.

4.2.3.2.3 Asynchronous Nature

There is no asynchronous activity in this implementation.

4.2.3.2.4 Implementation Identifying Information

Table 4-14: DICOM Implementation Class and Version for Print

Implementation Class UID	1.2.826.0.1.3680043.2.51
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4.2.3.3 Association Initiation Policy

A new association is initiated for each print operation.

4.2.3.4 Association Acceptance Policy

Print does not accept negotiations.

4.2.3.4.1 Activity - Print (PRINT-SCU)

4.2.3.4.1.1 Description and Sequencing of Activities

UGM DICOM prints to a DICOM compatible network color printer or film imager using an implementation of the SCU role of DICOM Print Management Class. It does this in the following way:

1. It uses the N-GET to request the printer status information.
2. It starts a film session and film box and sets the attributes of an image/annotation box in the background according to the format defined by the application.
3. It sends pixel/LUT data to the service provider.
4. It requests printing of a single film session.

It will request cancellation of printing per user's request.

4.2.3.4.1.2 Proposed Presentation Contexts

Table 4-15: Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Gray-scale 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

4.2.3.4.1.2.1 Extended Negotiation

The Print software does not attempt any extended negotiation.

4.2.3.4.1.3 SOP Specific Conformance to Print SOP Class

4.2.3.4.1.3.1 SOP Specific Conformance for the Film Session SOP Class

Print supports the N-CREATE DIMSE operations for the Film Session SOP Class.

Details of the supported attribute and status handling behavior are described in the following subsections.

4.2.3.4.1.3.1.1 Film Session SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed below.

Table 4-16: Film Session SOP Class N-CREATE Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	1 .. 10	ALWAYS	
Medium Type	(2000,0030)	CS	BLUE FILM, CLEAR FILM, or PAPER	ALWAYS	

The behavior of Print when encountering status codes in a N-CREATE response is summarized below.

Table 4-17: Film Session SOP Class N-CREATE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code	The Association is aborted.

4.2.3.4.1.3.2 SOP Specific Conformance for the Film Box SOP Class

Print supports the following DIMSE operations for the Presentation LUT SOP Class:

- N-CREATE
- N-ACTION

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.3.4.1.3.2.1 Film Box SOP Class Operations (N-CREATE)

The attributes supplied in a N-CREATE Request are shown below.

Table 4-18: Film Session SOP Class N-CREATE Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	CS	STANDARD1,1	ALWAYS	Auto
Referenced Film Session Sequence	(2010,0050)	SQ		ALWAYS	Auto
>Referenced SOP Class UID	(0008,1150)	UI	1.2.840.10008.5.1.1.1	ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI	From created Film Session SOP Instance	ALWAYS	Auto
Film Orientation	(2010,0040)	CS	PORTRAIT or LANDSCAPE	ALWAYS	User
Film Size ID	(2010,0050)	CS	8 IN X 10 IN, 10 IN X 12 IN, 10 IN X 14 IN, 14 IN X 17 IN, 24 CM X 24 CM, 24 CM X 30 CM	ALWAYS	CONFIG
Magnification Type	(2010,0060)	CS	REPLICATE	ALWAYS	User
Border Density	(2010,0010)	CS	BLACK	ALWAYS	User

4.2.3.4.1.3.2.2 Film Box SOP Class Operations (N-ACTION)

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box. The Action Reply argument in a N-ACTION response is not evaluated.

The behavior of Print when encountering status codes in a N-ACTION response is summarized below.

Table 4-19: Printer SOP Class N-ACTION Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code	The Association is aborted.

4.2.3.4.1.3.3 SOP Specific Conformance for the Image Box SOP Class

Print supports the N-SET DIMSE operation for the Image Box SOP Class

Details of the supported attribute and status handling behavior are described in the following subsections.

4.2.3.4.1.3.3.1 Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed below.

Table 4-20: Film Session SOP Class N-SET Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	1	ALWAYS	AUTO
Basic Grayscale Image Sequence	(2020,0110)	SQ		ALWAYS	AUTO
>Samples Per Pixel	(0028,0002)	US	1	ALWAYS	AUTO
>Photometric Interpretation	(0028,0004)	US	1	ALWAYS	AUTO
>Rows	(0028,0010)	US		ALWAYS	AUTO
>Columns	(0028,0011)	US		ALWAYS	AUTO
>Pixel Aspect Ratio	(0028,0034)	IS	1\1	ALWAYS	AUTO
>Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
>Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
>High Bit	(0028,0102)	US	7	ALWAYS	AUTO
>Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OB	Pixels rendered film sheet	ALWAYS	AUTO

The behavior of Hardcopy AE when encountering status codes in a N-SET response is summarized below.

Table 4-21: Printer SOP Class N-SET Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. Image successfully stored in Image Box.
*	*	Any other status code	The Association is aborted.

4.2.3.4.1.3.4 Transfer Syntax Selection Policies

Print always uses default transfer syntax as shown in [Table 4-15](#).

4.2.4 Snapshot Image Export

4.2.4.1 SOP Classes

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

Table 4-22: Support SOP Classes for Snapshot Image Export

SOP Class Name	SOP Class UID	Conformance	Role
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Standard	SCU

4.2.4.2 Association Establishment Policies

4.2.4.2.1 General

The Snapshot Image Export application will attempt to establish an association each time it is invoked, provided that a valid destination definition has been selected. When sending images, the association is closed as soon as the screen capture has been sent.

Table 4-23: Maximum PDU Size Received as a SCP for Snapshot Image Export

Maximum PDU size received	Unlimited
---------------------------	-----------

NOTE: This option is configurable.

4.2.4.2.2 Number of Associations

The Snapshot Image Export application will initiate only one association at a time. However, since there can be multiple PETView display applications open at the same time, it is possible for multiple snapshots to be invoked simultaneously. There is no synchronization attempted between multiple copies of the transfer software, so there may be a number of associations attempted simultaneously, limited only by the resources available.

Table 4-24: Number of Associations as a SCP for Snapshot Image Export

Maximum number of simultaneous associations	Unlimited
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4.2.4.2.3 Asynchronous Nature

There is no asynchronous activity in this implementation.

4.2.4.2.4 Implementation Identifying Information

Table 4-25: DICOM Implementation Class for Snapshot Image Export

Implementation Class UID	1.2.826.0.1.3680043.2. 51.1.19990211
Implementation Version Name	<i>UGM_DICOM_alpha</i>

4.2.4.3 Association Initiation Policy

The Snapshot Image Export application initiates an association each time you click **DICOM Snapshot**.

4.2.4.4 Association Acceptance Policy

The Snapshot Image Export application does not accept associations.

4.2.4.4.1 Activity - Snapshot Image Export

4.2.4.4.1.1 Description and Sequencing of Activities

The Associated Real World Activity is the attempt to transfer a snapshot of the display screen. This occurs when the operator manually selects the Snapshot Image Export function.

4.2.4.4.1.2 Accepted Presentation Contexts

Table 4-26: Acceptable Presentation Contexts for Snapshot Image Export

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.4.4.1.2.1 Extended Negotiation

Snapshot Image Export does not support extended negotiations.

4.2.4.4.1.3 SOP Specific Conformance

4.2.4.4.1.3.1 SOP Specific Conformance to the Secondary Capture Image Storage SOP Class

The Snapshot software provides Standard conformances to the DICOM Secondary Capture Image Storage Class.

4.2.4.4.1.3.2 Presentation Context Acceptance Criterion

Snapshot Image Export does not accept associations.

4.2.4.4.1.3.3 Transfer Syntax Selection Policies

Snapshot Image Export always uses Implicit VR Little Endian Transfer Syntax, as shown is [Table 4-26](#).

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

The TCP/IP protocol stack is supported over a standard Ethernet connection.

4.3.2 Additional Protocols

Host name and IP addresses are set up as part of the configuration process.

4.4 CONFIGURATION

All configuration for Import and Export is performed using the GUI interface provided with the software. Configuration of Print and Snapshot Export can be performed only by Philips Support Personnel or Service.

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles

All local application AE Titles and TCP/IP Ports are configurable. The AE Titles must be configured during installation. The local AE Title used by each individual application can be configured independently of the AE Title used by other applications. If so configured, all local AEs are capable of using the same AE Title.

Table 4-27: AE Title Configurations

Application Entity	Default AE Title	Default TCP/IP Port
Import Server	PHILIPS_PET_SCP	104
Export	PHILIPS_PET_SCU	104
Print	No default	104
Snapshot	No default	104

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Title, host names, and port numbers used by Import Server and Export are configured using the *dicomcfg* tool. Print and Snapshot require manual configuration.

4.4.1.2.1 Import Server

The *dicomcfg* function must be used to set the AE Title and port number for the Import Server. Associations will be accepted from any AE Titles.

4.4.1.2.2 Export

The *dicomcfg* function is used to set the AE Titles, port numbers, and host names for the remote SCPs. The Calling AE Title can also be configured separately for each remote SCP.

4.4.1.2.3 Print

The host name, AE Title, and port number for each printer must be manually configured.

4.4.1.2.4 Snapshot

The host name, AE Title, and port number for each printer must be manually configured.

4.4.2 Parameters

A large number of parameters related to acquisition and general operation can be configured. The table below shows those configuration parameters relevant to DICOM communication.

Table 4-28: Configuration Parameters

Parameter	Configurable (Yes/No)	Default Value
Export Parameters		
Protocol	Yes	TCP/IP
Port Number	Yes	104
Called AE Title (Local AE Title)	Yes	PHILIPS_PET_SCU
Calling AE Title (Remote AE Title)	Yes	None
Remote Host Name	Yes	None
Remote IP Address	Yes	None
Destination Menu Title	Yes	None
Time-out Duration	Yes	60s
Max PDU Size	Yes	16 KB
Export Native Data as PET or NM	Yes	PET
Import Parameters		
Port Number	Yes	104
Called AE Title (Local AE Title)	Yes	PHILIPS_PET_SCP
Time-out Duration	Yes	60s
Max PDU Size	Yes	16 KB
Print Parameters		
Name of Printer	Yes	None
Node Name in /etc/hosts	Yes	None
TCP Port Number	Yes	104
Called AE Title (Local AE Title)	Yes	ADAC
Calling AE Title (Remote AE Title)	Yes	None

Table 4-28: Configuration Parameters

Medium Type	Yes	Blue Film
Image Display Format	Yes	Standard\1,1
Display Orientation	Yes	Landscape
Copies to Print	Yes	1
Printing Priority	Yes	Med
Magnification Method	Yes	Replicate
Smoothing for CUBIC	Yes	0
Border Color	Yes	Black
No Image Box Color	Yes	Black
Trim Option	Yes	Yes
Black Density	Yes	1.7
Transpose the Image?	Yes	No
Convert to 8-bit Grayscale?	Yes	Yes
Snapshot Export Parameters		
Remote Host Name	Yes	None
TCP Port Number	Yes	104
Called AE Title (Local AE Title)	Yes	None
Calling AE Title (Remote AE Title)	Yes	UGM_SCU1
Max PDU Size	Yes	4096
Storage Parameters		
Number of times a failed send job may be retired	No	Operator may manually retry as many times as desired
Maximum number of simultaneously initiated Associations by the Storage AE	No	1
Print Parameters		
Number of times a failed print-job may be retired	Yes	0 (Failed send jobs are not retried)

5 MEDIA INTERCHANGE

Not applicable.

6 SUPPORT OF CHARACTER SETS

6.1 OVERVIEW

The Latin Alphabet No. 1, supplementary character set, identified as ISO-IR 100, is used and supported.

7 SECURITY

7.1 SECURITY PROFILES

None supported.

7.2 ASSOCIATION LEVEL SECURITY

None supported.

Any Calling AE Titles and/or IP addresses may open an Association.

7.3 APPLICATION LEVEL SECURITY

None supported.

8 ANNEXES

8.1 IOD CONTENTS

8.1.1 Created SOP Instances

The following tables use a number of abbreviations. The abbreviations used in the "Presence of Modules" column are:

VNAP	Value Not Always Present (attribute sent zero length if no value is present)
ANAP	Attribute Not Always Present
ALWAYS	Always Present
EMPTY	Attribute is sent without a value
NEVER	Attribute or Module is never sent

The abbreviations used in the "Source" column:

MWL	the attribute value source Modality Worklist
USER	the attribute value source is from User input
AUTO	the attribute value is generated automatically
MPPS	the attribute value is the same as that use for Modality Performed Procedure Step
CONFIG	the attribute value source is a configurable parameter

NOTE: All dates and times are encoded in the local configured calendar and time.

8.1.1.1 PET Image IOD

Table 8-1: IOD of Created PET SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8-4	ALWAYS
Study	General Study	Table 8-5	ALWAYS
	Patient Study	Table 8-6	ALWAYS
Series	General Series	Table 8-7	ALWAYS
	PET Series	Table 8-17	ALWAYS
	PET Isotope	Table 8-18	ALWAYS
	PET Multi-Gated Acquisition		NEVER
	NM/PET Patient Orientation	Table 8-19	ALWAYS
Frame of Reference	Frame of Reference	Table 8-8	ALWAYS
Equipment	General Equipment	Table 8-9	ALWAYS
Image	General Image	Table 8-11	ALWAYS
	Image Plane	Table 8-12	ALWAYS
	Image Pixel	Table 8-13	ALWAYS
	PET Image	Table 8-20	ALWAYS
	VOI LUT		NEVER
	Overlay Plane Module		NEVER
	SOP Common	Table 8-15	ALWAYS

8.1.1.2 NM Image IOD

Table 8-2: IOD of Created NM SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8-4	ALWAYS
Study	General Study	Table 8-5	ALWAYS
	Patient Study	Table 8-6	ALWAYS

Table 8-2: IOD of Created NM SOP Instances

Series	General Series	Table 8-7	ALWAYS
	NM/PET Orientation module	Table 8-19	ALWAYS
Frame of Reference	Frame of Reference	Table 8-8	ALWAYS
Equipment	General Equipment	Table 8-9	ALWAYS
Image	NM Image Pixel	Table 8-21	ALWAYS
	General Image	Table 8-11	ALWAYS
	Image Pixel	Table 8-13	ALWAYS
	Multi-frame	Table 8-16	ALWAYS
	NM Multi-frame	Table 8-22	ALWAYS
	NM Image	Table 8-23	ALWAYS
	NM Isotope	Table 8-24	ALWAYS
	NM Detector	Table 8-25	ALWAYS
	NM TOMO Acquisition	Table 8-26	ALWAYS
	NM Multi-gated Acquisition		NEVER
	NM Phase		NEVER
	NM Reconstruction	Table 8-27	ALWAYS
	Overlay Plane		NEVER
	Multi-frame Overlay		NEVER
	Curve		NEVER
	VOI LUT		NEVER
SOP Common		NEVER	

8.1.1.3 Secondary Capture IOD

Table 8-3: IOD of Created Grayscale Secondary Capture SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8-4	ALWAYS
Study	General Study	Table 8-5	ALWAYS
	Patient Study	Table 8-6	ALWAYS
Series	General Series	Table 8-7	ALWAYS
Equipment	General Equip-ment	Table 8-9	ALWAYS
	SC Equipment	Table 8-10	ALWAYS
Image	General Image	Table 8-11	ALWAYS
	Image Pixel	Table 8-13	ALWAYS
	SC Image	Table 8-14	ALWAYS
	Overlay Plane		NEVER
	Modality LUT		NEVER
	VOI LUT		NEVER
	SOP Common	Table 8-15	ALWAYS

8.1.1.4 Common Modules

Table 8-4: Common Patient Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN		ALWAYS	MWL or User
Patient ID	(0010,0020)	LO		ALWAYS	MWL or User
Patient's Birth Date	(0010,0030)	DA		ALWAYS	MWL or User
Patient's Sex	(0010,0040)	CS		ALWAYS	MWL or User
				SC IOD VNAP	
Patient Com-ments	(0010,4000)	LT		NEVER	

Table 8-5: Common General Study Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL or AUTO
Study Date	(0080,0020)	DA		ALWAYS	AUTO
Study Time	(0008,0030)	TM		ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN		VNAP	USER
Study ID	(0020,0010)	SH		ALWAYS	USER
Accession Number	(0008,0050)	SH		VNAP	MWL or USER
Study Description	(0008,1030)	LO		ALWAYS	USER
Referenced Study Sequence	(0008,1110)	SQ			
>Referenced SOP Class UID	(0008,1150)	UI		NEVER	
>Referenced SOP Instance UID	(0008,1155)	UI		NEVER	

Table 8-6: Common Patient Study Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Admitting Diagnosis Description	(0008,1080)	LO		NEVER	
Patient's Age	(0010,1010)	AS		NEVER	
Patient's Weight	(0010,1030)	DS		VNAP	USER

Table 8-7: Common General Series Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS		ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Performing Physician's Name	(0008,1050)	PN		NEVER	
Protocol Name	(0018,1030)	LO		ALWAYS	AUTO
Series Description	(0008,103E)	LO		ALWAYS	AUTO
Operator's Name	(0008,1070)	PN		NEVER	
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		NEVER	
>Referenced SOP Class UID	(0008,1150)	UI		NEVER	
>Referenced SOP Instance UID	(0008,1155)	UI		NEVER	
Body Part Examined	(0018,0015)			NEVER	
Patient Position	(0018,5100)			ALWAYS	AUTO
Smallest Pixel Value in Series	(0028,0108)			NEVER	
Largest Pixel Value in Series	(0028,0109)			NEVER	

Table 8-7: Common General Series Module for Created SOP Instances

Request Attributes Sequence	(0040,0275)	SQ		NEVER	
>Requested Procedure ID	(0040,1001)	SH		NEVER	
>Scheduled Procedure Step ID	(0040,0009)	SH		NEVER	
>Scheduled Procedure Step Description	(0040,0007)	LO		NEVER	
>Scheduled Protocol Code Sequence	(0040,0008)	SQ		NEVER	
Performed Procedure Step ID	(0040,0253)	SH		NEVER	
Performed Procedure Step Start Date	(0040,0244)	DA		NEVER	
Performed Procedure Step Start Time	(0040,0245)	TM		NEVER	
Performed Procedure Step Description	(0040,0254)	LO		NEVER	
Performed Protocol Code Sequence	(0040,0260)	SQ		NEVER	
Comments on the Performed Procedure Step	(0040,0280)	LO		NEVER	

Table 8-8: Common Frame of Reference Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame of Reference UID	(0020,0052)	UI	Philips Medical Systems	ALWAYS	AUTO
Position Reference Indicator	(0020,1040)	LO		VNAP	

Table 8-9: Common General Equipment Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	Philips Medical Systems	ALWAYS	AUTO
Institution Name	(0008,0080)	LO		ALWAYS	AUTO
Institution Address	(0008,0081)	ST		NEVER	
Station Name	(0008,1010)	SH		ALWAYS	AUTO
Institutional Department Name	(0008,1040)	LO		NEVER	
Manufacturer's Model Name	(0008,1090)	LO		VNAP	
Device Serial Number	(0018,1000)	LO		ALWAYS	AUTO
Software Version	(0018,1020)	LO		ALWAYS	AUTO
Spatial Resolution	(0018,1050)	DS		NEVER	
Date of Last Calibration	(0018,1200)	DA		NEVER	
Time of Last Calibration	(0018,1201)	TM		NEVER	
Pixel Padding Value	(0028,0120)	US		NEVER	

Table 8-10: Common SC Image Equipment Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Conversion Type	(0008,0064)	CS	WSD	ALWAYS	
Modality	(0008,0060)	CS		ALWAYS	AUTO
Secondary Capture Device ID	(0018,1010)	LO		ALWAYS	AUTO
Secondary Capture Device Manufacturer	(0018,1016)	LO		NEVER	
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	LO		NEVER	
Secondary Capture Device Software Version	(0018,1019)	LO		NEVER	
Video Image Format Acquired	(0018,1022)	SH		NEVER	
Digital Image Format Acquired	(0018,1023)	LO		NEVER	

Table 8-11: Common General Image Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS		ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS		NEVER	
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Image Type	(0008,0008)	CS		ALWAYS	AUTO
Acquisition Number	(0020,0012)	IS		NEVER	
Acquisition Date	(00080022)	DA		ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM		ALWAYS	AUTO
Acquisition Datetime	(0008,0024)	DT		NEVER	
Referenced Image Sequence	(0008,1140)	SQ		NEVER	
Referenced SOP Class UID	(0009,1150)	UI		NEVER	
Referenced SOP Instance UID	(0008,1151)	UI		NEVER	
Referenced Frame Number	(0008,1160)	IS		NEVER	
Purpose of Reference Code Sequence	(0040,A170)	SQ		NEVER	
Derivation Description	(0008,2111)	ST		NEVER	
Derivation Code Sequence	(0008,9215)	SQ		NEVER	

Table 8-11: Common General Image Module for Created SOP Instances

Source/ Image Sequence	(0008,2112)	SQ		NEVER	
Referenced Waveform Sequence	(0008,113A)	SQ		NEVER	
Images in Acquisition	(0020,1002)	IS		NEVER	
Image Com- ments	(0020,4000)	LT		VNAP	AUTO
Quality Con- trol Image	(0028,0300)	CS		NEVER	
Burned in Annotation	(0028,0301)	CS		NEVER	
Lossy Image Compression	(0028,2110)	DS		NEVER	
Lossy Image Compres- sion Ratio	(0088,0200)	DS		NEVER	
Icon Image Sequence	(0088,0200)	SQ		NEVER	
Presentation LUT Shape	(2050,0020)	CS		NEVER	

Table 8-12: Common Image Plane Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Pixel Spacing	(0028,0030)	DS		ALWAYS	AUTO
Image Orien- tation (Patient)	(0020,0037)	DS		ALWAYS	AUTO
Image Posi- tion	(0020,0032)	DS		ALWAYS	AUTO
Slice Thick- ness	(0018,0050)	DS		ALWAYS	AUTO
Slice Loca- tion	(0020,1041)	DS		VNAP	

Table 8-13: Common Image Pixel Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Pixel Data	(7FEO,0010)	OW		ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS		ALWAYS	AUTO
Rows	(0028,0010)	US		ALWAYS	AUTO
Columns	(0028,0011)	US		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US		ALWAYS	AUTO
Bits Stored	(0028,0101)	US		ALWAYS	AUTO
High Bit	(0028,0102)	US		ALWAYS	AUTO
Pixel Representation	(0028,0103)	US		ALWAYS	AUTO
Pixel Data	(7FEO,0010)	OW		ALWAYS	AUTO
Planar Configuration	(0028,0006)	US		NEVER	
Pixel Aspect Ratio	(0028,0034)	IS		NEVER	
Smallest Image Pixel Value	(0028,0106)	US		ALWAYS	AUTO
Largest Image Pixel Value	(0028,0107)	US		ALWAYS	AUTO
Red Palette Color Lookup Table Descriptor	(0028,1101)	US		NEVER	
Green Palette Color Lookup Table Descriptor	(0028,1102)	US		NEVER	
Blue Palette Color Lookup Table Descriptor	(0028,1103)	US		NEVER	

Table 8-13: Common Image Pixel Module for Created SOP Instances

Red Palette Color Lookup Table Data	(0028,1201)	OW		NEVER	
Green Palette Color Lookup Table Data	(0028,1202)	OW		NEVER	
BLUE Palette Color Lookup Table Data	(0028,1203)	OW		NEVER	

Table 8-14: Common SC Image Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Date of Secondary Capture	(0018,1012)	DA		ALWAYS	AUTO
Time of Secondary Capture	(0018,1014)	TM		ALWAYS	AUTO

Table 8-15: Common SOP Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI		ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS		NEVER	
Instance Creation Date	(0008,0012)	DA		NEVER	
Instance Creation Time	(0008,0013)	TM		NEVER	
Instance Creator UID	(0008,0014)	UI		NEVER	
Scheme Identification Sequence	(0008,0110)	SQ		NEVER	
Timezone Offset From UTC	(0008,0201)	SH		NEVER	
Contributing Equipment Sequence	(0008,A001)	SQ		NEVER	
Instance Number	(0020,0013)	IS		ALWAYS	AUTO
SOP Instance Status	(0100,0410)	CS		NEVER	
SOP Authorization Date and Time	(0100,0420)	DT		NEVER	
SOP Authorization Comment	(0100,0424)	LT		NEVER	
Authorization Equipment Certification Number	(0100,0426)	LO		NEVER	

Table 8-15: Common SOP Module for Created SOP Instances

Encrypted Attributes Sequence	(0040,0500)	SQ		NEVER	
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Table 8-16: Common Multi-frame Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US		ALWAYS	AUTO
Bits Stored	(0028,0101)	US		ALWAYS	AUTO
High Bit	(0028,0102)	US		ALWAYS	AUTO
Pixel Spacing	(0028,0030)	DS		ALWAYS	AUTO

8.1.1.5 PET Modules

Table 8-17: PET Series Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Units	(0054,1001)	CS	CNTS	ALWAYS	AUTO
Counts Source	(0054,1002)	CS		ALWAYS	AUTO
Series Type	(0054,1000)	CS		ALWAYS	AUTO
Reprojection Method	(0054,1004)	CS		NEVER	
Number of R-R Intervals	(0054,0061)	US		NEVER	
Number of Time Slots	(0054,0071)	US		NEVER	
Number of Time Slices	(0054,0101)	US		VNAP	AUTO
Number of Slices	(0054,0081)	US		ALWAYS	AUTO
Corrected Image	(0028,0051)	CS		ALWAYS	AUTO
Randoms Correction Method	(0054,1100)	CS		ALWAYS	AUTO
Attenuation Correction Method	(0054,1101)	LO		ALWAYS	AUTO
Scatter Correction Method	(0054,1105)	LO		ALWAYS	AUTO
Decay Correction	(0054,1102)	CS		ALWAYS	AUTO
Reconstruction Diameter	0018,1100)	DS		ALWAYS	AUTO
Convolution Kernel	(0018,1210)	SH		NEVER	
Reconstruction Method	(0054,1103)	LO		ALWAYS	AUTO

Table 8-17: PET Series Module for Created SOP Instances

Detector Lines of Response Used	(0054,1104)	LO		NEVER	
Acquisition Start Condition	(0018,0073)	CS		NEVER	
Acquisition Start Condition Data	(0018,0074)	IS		NEVER	
Acquisition Termination Condition	(0018,0071)	CS		NEVER	
Acquisition Termination Condition Data	(0018,0075)	IS		NEVER	
Field of View Shape	(0018,1147)	CS	CYLINDRICAL RING	ALWAYS	AUTO
Field of View Dimensions	(0018,1149)	IS		ALWAYS	AUTO
Gantry/ Detector Tilt	(0018,1120)	DS		NEVER	
Gantry/ Detector Slew	(0018,1121)	DS		NEVER	
Type of Detector Motion	(0054,0202)	CS	NONE	ALWAYS	AUTO
Collimator Type	(0018,1181)	CS	NONE	ALWAYS	AUTO
Collimator/ Grid Name	(0018,1180)	SH		NEVER	
Axial Acceptance	(0054,1200)	DS		NEVER	
Axial Mash	(0054,1201)	IS		NEVER	
Transverse Mash	(0054,1202)	IS		NEVER	
Detector Element Size	(0054,1203)	DS		NEVER	

Table 8-17: PET Series Module for Created SOP Instances

Coincidence Window Width	(0054,1210)	DS		NEVER	
Energy Window Range Sequence	(0054,0013)	SQ		NEVER	
Secondary Counts Type	(0054,1220)	CS		NEVER	

Table 8-18: PET Isotope Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Radiopharmaceutical Information Sequence	(0054,0016)	SQ		ALWAYS	AUTO
>Radionuclide Code Sequence	(0054,0300)	SQ		ALWAYS	AUTO
>Radiopharmaceutical Route	(0018,1070)	LO		NEVER	
>Administration Route Code Sequence	(0054,0302)	SQ		NEVER	
>Radiopharmaceutical Volume	(0018,1071)	DS		NEVER	
>Radiopharmaceutical Start Time	(0018,1072)	TM		ALWAYS	AUTO
>Radiopharmaceutical Stop Time	(0018,1073)	TM		ALWAYS	AUTO
>Radionuclide Total Dose	(0018,1074)	DS		ALWAYS	AUTO
>Radionuclide Half Life	(0018,1075)	DS		ALWAYS	AUTO

Table 8-18: PET Isotope Module for Created SOP Instances

>Radionuclide Positron Fraction	(0018,1076)	DS		NEVER	
>Radiopharmaceutical Specific Activity	(0018,1077)	DS		NEVER	
>Radiopharmaceutical	(0018,0031)	LO		NEVER	
>Radiopharmaceutical Code Sequence	(0054,0304)	SQ		NEVER	
Intervention Drug Information Sequence	(0018,0026)	SQ		NEVER	

Table 8-19: NM/PET Patient Orientation Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Orientation Code Sequence	0054,0410	SQ		ALWAYS	AUTO
Patient Orientation Modifier Code Sequence	0054,0412	SQ		ALWAYS	AUTO
Patient Gantry Relationship Code Sequence	0054,0104	SQ		ALWAYS	AUTO

Table 8-20: PET Image Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS		ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US		ALWAYS	AUTO
Bits Stored	(0028,0101)	US		ALWAYS	AUTO
High Bit	(0028,0102)	US		ALWAYS	AUTO
Rescale Intercept	(0028,1052)	DS		ALWAYS	AUTO
Rescale Slope	((0028,1053)	DS		ALWAYS	AUTO
Frame Reference Time	(0054,1300)	DS		ALWAYS	AUTO
Trigger Time	(0018,1060)	DS		NEVER	
Frame Time	(0018,1063)	DS		NEVER	
Low R-R Value	(0018,1081)	IS		NEVER	
High R-R Value	(0018,1082)	IS		NEVER	
Lossy Image Compression	(0028,2110)	CS		NEVER	
Image Index	(0054,1330)	US		ALWAYS	AUTO
Acquisition Date	(0008,0022)	DA		ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM		ALWAYS	AUTO
Actual Frame Duration	(0018,1242)	IS		ALWAYS	AUTO
Nominal Interval	(0018,1062)	IS		NEVER	
Intervals Acquired	(0018,1083)	IS		NEVER	

Table 8-20: PET Image Module for Created SOP Instances

Intervals Rejected	(0018,1084)	IS		NEVER	
Primary (Prompts) Counts Accumulated	(0054,1310)	IS		NEVER	
Secondary Counts Accumulated	(0054,1311)	IS		NEVER	
Slice Sensitivity Factor	(0054,1320)	DS		NEVER	
Decay Factor	(0054,1321)	DS		NEVER	
Dose Calibration Factor	(0054,1322)	DS		NEVER	
Scatter Fraction Factor	(0054,1323)	DS		NEVER	
Dead Time Factor	(0054,1324)	DS		NEVER	
Referenced Overlay Sequence	(0008,1130)	SQ		NEVER	
Referenced Curve Sequence	(0008,1145)	SQ		NEVER	
Anatomic Region Sequence	(0008,2218)	SQ		NEVER	
Primary Anatomic Structure Sequence	(0008,2228)	SQ		NEVER	

8.1.1.6 NM Modules

Table 8-21: NM Image Pixel Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US		ALWAYS	AUTO
Bits Stored	(0028,0101)	US		ALWAYS	AUTO
High Bit	(0028,0102)	US		ALWAYS	AUTO
Pixel Spacing	(0028,0030)	DS		ALWAYS	AUTO

Table 8-22: NM Multi-frame Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Increment Pointer	(0028,0009)	AT		ALWAYS	AUTO
Energy Window Vector	(0028,0010)	US		NEVER	
Number of Energy Windows	(0028,0011)	US		ALWAYS	AUTO
Detector Vector	(0054,0020)	US		NEVER	
Number of Detectors	(0054,0021)	US		ALWAYS	AUTO
Phase Vector	(0054,0030)	US		NEVER	
Number of Phases	(0054,0031)	US		NEVER	
Rotation Vector	(0054,0050)	US		NEVER	
Number of Rotations	(0054,0051)	US		ALWAYS	AUTO
R-R Interval Vector	(0054,0060)	US		NEVER	

Table 8-22: NM Multi-frame Module for Created SOP Instances

Number of R-R Intervals	(0054,0061)	US		NEVER	
Time Slot Vector	(0054,0070)	US		NEVER	
Number of Time Slots	(0054,0071)	US		NEVER	
Slice Vector	(0054,0080)	US		ALWAYS	AUTO
Number of Slices	(0054,0081)	US		ALWAYS	AUTO
Angular View Vector	(0054,0090)	US		NEVER	
Time Slice Vector	(0054,0100)	US		NEVER	

Table 8-23: NM Image Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS		ALWAYS	AUTO
Image ID	(0054,0400)	SH		NEVER	
Lossy Image Compression	(0028,2110)	CS		NEVER	
Counts Accumulated	(0018,0070)	IS		ALWAYS	AUTO
Acquisition Termination Condition	(0018,0071)	CS		NEVER	
Table Height	(0018,1130)	DS		NEVER	
Table Traverse	(0018,1131)	DS		NEVER	
Actual Frame Duration	(0018,1242)	IS		NEVER	
Count Rate	(0018,1243)	IS		NEVER	
Processing Function	(0018,5020)	LO		NEVER	
Corrected Image	(0028,0051)	CS		ALWAYS	AUTO
Whole Body Technique	(0018,1301)	CS		NEVER	
Scan Velocity	(0018,1300)	DS		NEVER	
Scan Length	(0018,1302)	IS		NEVER	
Referenced Overlay Sequence	(0008,1130)	SQ		NEVER	
Referenced Curve Sequence	(0008,1145)	SQ		NEVER	
Trigger Source or Type	(0018,1061)	LO		NEVER	
Anatomic Region Sequence	(0008,2218)	SQ		NEVER	

Table 8-23: NM Image Module for Created SOP Instances

Primary Anatomical Structure Sequence	(0008,2228)	SQ		NEVER	
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Table 8-24: NM Isotope Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Energy Window Information Sequence	(0054,0012)	SQ		ALWAYS	AUTO
>Energy Window Name	(0054,0018)	SH		NEVER	
>Energy Window Range Sequence	(0054,0013)	SQ		NEVER	
Radiopharmaceutical Information Sequence	(0054,0015)	SQ		ALWAYS	AUTO
>Radionuclide Code Sequence	(0054,0300)	SQ		ALWAYS	AUTO
>Radiopharmaceutical Route	(0018,1070)	LO		NEVER	
>Administration Route Code Sequence	(0054,0302)	SQ		NEVER	
>Radiopharmaceutical Volume	(0018,1071)	DS		NEVER	
>Radiopharmaceutical Start Time	(0018,1072)	TM		ALWAYS	AUTO
>Radiopharmaceutical Stop Time	(0018,1073)	TM		NEVER	

Table 8-24: NM Isotope Module for Created SOP Instances

>Radionuclide Total Dose	(0018,1074)	DS		ALWAYS	AUTO
>Calibration Data Sequence	(0054,0306)	SQ		NEVER	
>Radiopharmaceutical	(0018,0031)	LO		NEVER	
>Radiopharmaceutical Code Sequence	(0054,0304)	SQ		NEVER	
Intervention Drug Information Sequence	(0018,0026)	SQ		NEVER	

Table 8-25: NM Detector Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Detector Information Sequence	(0054,0022)	SQ		ALWAYS	AUTO
>Collimator/ Grid Name	(0018,1180)	SH		NEVER	
>Collimator Type	(0018,1181)	CS	NONE	ALWAYS	AUTO
>Field of View Shape	(0018,1147)	CS	CYLINDRICAL RING	ALWAYS	AUTO
>Field of View Dimensions (s)	(0018,1149)	IS		ALWAYS	AUTO
>Focal Distance	(0018,1182)	IS		VNAP	AUTO
>X Focus Center	(0018,1183)	DS		NEVER	
>Y Focus Center	(0018,1184)	DS		NEVER	
>Zoom Center	(0028,0032)	DS		NEVER	

Table 8-25: NM Detector Module for Created SOP Instances

>Zoom Factor	(0028,0031)	DS		NEVER	
>Center of Rotation Offset	(0018,1145)	DS		NEVER	
>Gantry/ Detector Tilt	(0018,1120)	DS		NEVER	
>Distance Source to Detector	(0018,1110)	DS		NEVER	
>Start Angle	(0054,0200)	DS		NEVER	
>Radial Position	(0018,1142)	DS		NEVER	
>Image Orientation (Patient)	(0020,0037)	DS		ALWAYS	AUTO
>Image Position (Patient)	(0020,0032)	DS		ALWAYS	AUTO
>View Code Sequence	(0054,0220)	SQ		VNAP	AUTO
>>View Modifier Code Sequence	(0054,0222)	SQ		NEVER	

Table 8-26: NM TOMO Acquisition Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Rotation Information Sequence	(0054,0052)	SQ		VNAP	AUTO
Type of Detector Motion	(0054,0202)	CS		NEVER	

Table 8-27: NM Reconstruction Module for Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Spacing Between Slices	(0018,0088)	DS		ALWAYS	AUTO
Reconstruction Diameter	(0018,1100)	DS		ALWAYS	AUTO
Convolution Kernel	(0018,1210)	SH		NEVER	
Slice Thickness	(0018,0050)	DS		ALWAYS	AUTO
Slice Location	(0020,1041)	DS		NEVER	

8.1.1.7 Secondary Capture Modules

8.1.2 Usage of Attributes from Received IODs

The local database, remote query, and directory browsers make use of the conventional identification attributes to distinguish patients, studies, series, and instances. In particular, if two patients have the same value for Patient ID, they will be treated as the same in the browser and the local database.

8.1.3 Attribute Mapping

Attribute Mapping is not applicable.

8.1.4 Coerced/Modified Fields

No coercion is performed.

8.2 DATA DICTIONARIES

The Export software provides Standard Extended conformance to the DICOM PET SOP Class. The additional Private data elements that may be included have group number 0x7053, and may contain Gemini and Allegro specific information which could not be encoded in the standard PET IOD, and would be meaningless for non-Gemini and non-Allegro systems. However, some receiving systems may need to be informed of the VR for these private elements in order to properly receive and store them. The following table shows the VR for each of these elements.

Table 8-28: Private Elements for PET Images

Tag	VR	Meaning	VM
7053,0010	LO	Private Creator Data element	1
7053,1000	DS	SUV Factor. The SUV Factor is used to convert the pixel data from counts to an SUV value. This is done by multiplying each pixel value by the SUV Factor. If the SUV Factor is 0.0, then the pixel data cannot be converted from counts to an SUV value.	1
7053,1001	OB	Private	1
7053,1002	OB	Private	1
7053,1003	ST	Original image file name	1

The Private Creator Data Element [7053,0010], which is used to reserve these private data elements, has value "Philips PET Private Group".

Table 8-29: Private Elements for Snapshot Images

Tag	VR	Meaning	VM
0511,0010	LO	Private Creator Data element	1
0511,1000	US		
0511,1001	US		
0511,1002	OB		
0511,1003	OB		
0511,1032	DS		
0511,1050	DS		

8.3 CODED TERMINOLOGY

The following attributes use coded terminology:

Table 8-30: Coded Terminology in PET/NM Images

Tag	Name	CID	Configurable
0054,0300	Radionclide Code Sequence	18	NO
0054,0220	View Code Sequence	26	NO
0054,0410	Patient Orientation Code Sequence		NO
0054,0412	Patient Orientation Modifier Code Sequence		NO
0054,0414	Patient Gantry Relationship Code Sequence		NO

8.3.1 Context Groups

Context groups are not applicable.

8.3.2 Template Specifications

Template Specifications are not applicable.

8.3.3 Private Code Definitions

Private Code Definitions are not applicable.

8.4 GRAYSCALE IMAGE CONSISTENCY

The DICOM Grayscale Standard Display Function is not supported.

8.5 STANDARD EXTENDED SOPS

No specializations or privatizations are used in this implementation. The NM and PET SOP Class is due to addition of private attributes listed in [Table 8-28](#) and [Table 8-29](#). Standard conformance is provided for all other supported SOP classes.

8.6 PRIVATE TRANSFER SYNTAX

No Private Transfer Syntax is supported.