

# AGFA HEALTHCARE DICOM Conformance Statement



## Paxport Version for 4.0 and 4.1

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## 1. Conformance Statement Overview

The Paxport Version for 4.0 and 4.1, implements the necessary DICOM services (in accordance with the IHE Technical Framework) as an Acquisition Modality. The Paxport Version for 4.0 and 4.1 may also acquire patient information from a Hospital Information System (RIS) for use in identifying images.

The table below provides an overview of the network services supported by Paxport Version for 4.0 and 4.1 system.

### *Network Services Supported*

<b>SOP Classes</b>	<b>User of Service (SCU)</b>	<b>Provider of Service (SCP)</b>
<b>Verification</b>		
Verification	Yes	No
<b>Transfer</b>		
Secondary Capture Image Storage	Yes	No
Storage Commitment	Yes	No
<b>Print Management</b>		
Basic Grayscale Print Management	Yes	No
Basic Color Print Management	Yes	No
Basic Annotation Box	Yes	No
Print Job	No	No
Presentation LUT	Yes	No
Print Queue Management	No	No
<b>Workflow Management</b>		
Modality Performed Procedure Step	Yes	No
Modality Worklist Information Model	Yes	No

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# 1 INTRODUCTION

## 1.1 Revision Record

**Table 1:1 Revision Record**

Revision Number	Date	Author	Reason for Change
1.0	February 18, 2005	Ron Kaufman	New
1.1	May 4, 2005	Peter Luyckx	Review and modifications

## 1.2 Purpose and Intended Audience of this Document

This document is a DICOM Conformance Statement for the DICOM Services of the Paxport Version 4.x modality.

The user of this document is involved with system integration and/or software design. We assume that the reader is familiar with the terminology and concepts that are used in the DICOM 3.0 standard and the IHE Technical Framework.

Readers not familiar with DICOM 3.0 terminology should first read the appropriate parts of the DICOM standard itself, prior to reading this conformance statement.

Although the use of this conformance statement in conjunction with the DICOM 3.0 standard is intended to facilitate communication with Agfa Healthcare equipment, it is not sufficient to guarantee, by itself, the inter-operation of the connection.

## 1.3 General Remarks

### 1.3.1 Integration and Validation Activities

The integration of any device into a system of interconnected devices goes beyond the scope of the DICOM 3.0 standard and this conformance statement when *interoperability* is desired. The responsibility for analyzing the applications requirements and developing a solution that integrates the Agfa equipment with other vendors' systems is the user's responsibility and should not be underestimated.

In some circumstances it might be necessary to perform a validation to make sure that functional interoperability between the Agfa equipment and non-Agfa devices works as expected. The user should ensure that any non-Agfa equipment provider accepts responsibility for any validation required for their connection with the Agfa equipment.

### 1.3.2 Future Evolution

As the DICOM 3.0 standard evolves to meet the user's growing requirements and to incorporate new features and technologies, Agfa will follow the evolution of the standard. This evolution of the standard may require changes to devices that have implemented DICOM 3.0. The user should ensure that any non-Agfa provider, who connects with Agfa devices, also plans for future evolution of the DICOM standard. A refusal to do so may result in the loss of functionality and/or connectivity between the different products.

## 1.4 Acronyms and Abbreviations

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard. Abbreviations and terms are as follows:

AE	DICOM Application Entity
ACR	American College of Radiology
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Elements
GUI	Graphical User Interface
IHE	Integrating the HealthCare Enterprise
LUT	Look-up Table
MPPS	Modality Performed Procedure Step
MSPS	Modality Scheduled Procedure Step
NEMA	National Electrical Manufactures Association
PDU	DICOM Protocol Data Unit
SC	Secondary Capture
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
VR	Value Representation
VOI LUT	Value of Interest Look-up Table

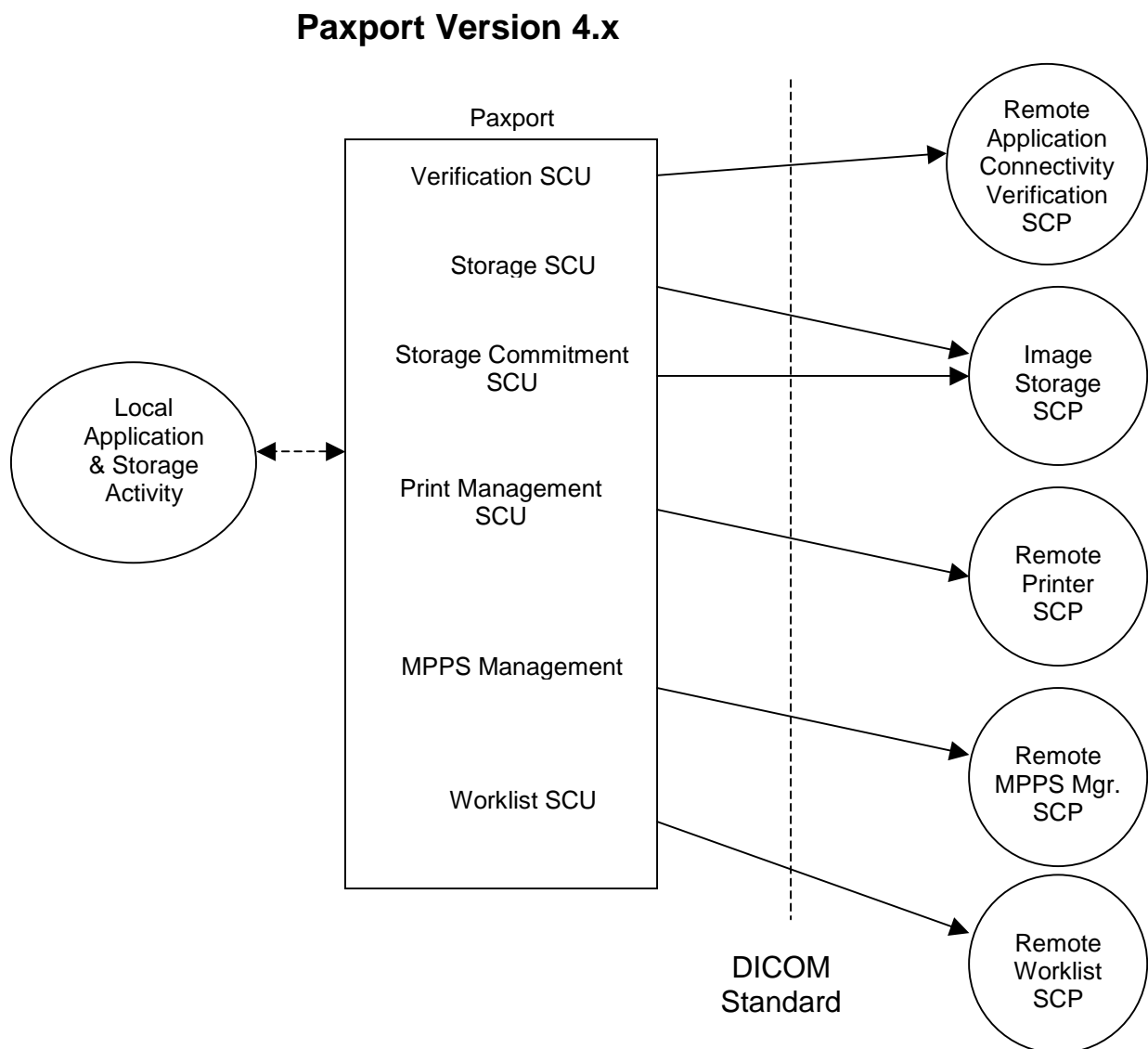
## 1.5 References

- ACR-NEMA Digital Imaging and Communications in Medicine (DICOM) V3.0. 2003.
- IHE Radiology Technical Framework Revision 5.5 – Final Text, November 20, 2003

## 2 NETWORKING

### 2.1 Implementation Model

#### 2.1.1 Application Data Flow Diagram



**Figure 2-1 Functional Overview – Application Data Flow**

## 2.1.2 Functional Definitions of AE's

### 2.1.2.1 Functional Capability of Paxport Application Entity

The Paxport Application Entity receives images from a non- DICOM (digital and video) modality. It then sends these images as SC DICOM Images to remote Storage and/or Print DICOM devices.

The Paxport Application Entity uses the C-FIND to get a response from a Worklist Provider for the creation of a Worklist. This allows the user to easily add patient information when sending images.

## 2.2 AE Specifications

### 2.2.1 Paxport AE Specification

#### 2.2.1.1 SOP Classes Supported

This Application Entity provides Standard Conformance to the following SOP Classes:

**Table 2:1 SOP Classes for Paxport AE**

SOP Class Name	SOP Class UID	SCU	SCP
<b>Verification</b>			
Verification SOP Class	1.2.840.10008.1.1	Yes	No
<b>Transfer</b>			
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
<b>Print Management</b>			
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
Basic Annotation SOP Class	1.2.840.10008.5.1.1.15	Yes	No
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No
<b>Workflow Management</b>			
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No

## 2.2.1.2 Association Establishment Policies

### 2.2.1.2.1 General

**Table 2:2 DICOM Application Context**

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

### 2.2.1.2.2 Number of Associations

**Table 2:3 Number of Associations as an Association Initiator for Paxport**

Maximum number of simultaneous associations initiated	(See Note 1)
---	--------------

**Table 2:4 Number of Associations as an Association Acceptor for Paxport**

Maximum number of simultaneous associations accepted	0
--	---

### 2.2.1.2.3 Asynchronous Nature

**Table 2:5 Asynchronous Nature as an Association Initiator for Paxport**

Maximum number of outstanding asynchronous transactions	(See Note 2)
---	--------------

#### **Note 1:**

The Paxport opens one association for querying worklist items, but can open different associations for printing and/or archiving to multiple destinations simultaneously. There is no inherent limit to the number of associations other than limits imposed by the computer operating system.

#### **Note 2:**

Paxport allows a single outstanding operation on any association. The PAXPORT will wait for a response from the SCP AE before attempting another operation during the same association.

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

### 2.2.1.2.4 Implementation Identifying Information

**Table 2:6 DICOM implementation Class and Version for Transfer, MPPS, and Print**

Implementation Class UID	1.3.51.0.1.3
Implementation Version Name	AGFAPAXPORT 1.0

**Table 2:7 DICOM implementation Class and Version for Worklist**

Implementation Class UID	1.3.51.0.1.3
Implementation Version Name	AGFA DTF1.0.73

## 2.2.1.3 Association Initiation Policies

### 2.2.1.3.1 Activity- Request Verification of External AE

#### 2.2.1.3.1.1 Description and Sequencing of Activity

The Paxport AE attempts to initiate a DICOM association due to the following activity:

- Initiation of Verification by Service (Paxport GUI service tool).

A typical sequence of DIMSE messages sent over an association between Paxport and another device is:

- Service Initiates a DICOM Association to send the request.
- Issue a C-ECHO request.
- Wait for a C-ECHO response.
- Close the Association.

#### 2.2.1.3.1.2 Proposed Presentation Contexts

**Table 2:8 Presentation Contexts Proposed by Paxport**

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

#### 2.2.1.3.1.3 Specific Conformance for Verification SOP Class

The Paxport provides standard conformance to the DICOM Verification Service Class as a SCU.

##### 2.2.1.3.1.3.1.1 Supported DICOM Status code for C-ECHO

The following status code is returned in response to a C-ECHO:

**Table 2:9 C-ECHO Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	

### 2.2.1.3.2 Activity- Send Images to External Storage AE

#### 2.2.1.3.2.1 Description and Sequencing of Activity

The Paxport AE attempts to initiate a new association due to Initiation of a Transmit by the User.

A typical sequence of DIMSE messages sent over an association between Paxport and a Storage SCP is:

1. Paxport sends an ASSOCIATE-RQ to open an association with the Storage AE.
2. Paxport sends a C-STORE-RQ on the SC Image Storage SOP Class to transmit the images.
3. Paxport sends a RELEASE-RQ to close the association with the Storage AE.

The Paxport AE supports Storage Commitment when transmitting images.

A typical sequence of DIMSE messages sent over an association between Paxport and a Storage SCP is:

1. Paxport sends an ASSOCIATE-RQ to open an association with the Storage AE.
2. Paxport sends an N-ACTION-RQ.
3. Paxport accepts N-ACTION response to determine if the SCP will commit to the storage.
4. Paxport sends a RELEASE-RQ to close the association with the Storage AE.
5. Paxport listens for N-EVENT-REPORT.

#### Note:

All printed and stored images remain in a ring-buffer or FIFO on the harddisk of the PaxPort, to enable reprints or re-stores at a later time. When this buffer is full, the first image needs to be removed permanently. This action will be delayed when its corresponding SOP instance UID was reported in the N-EVENT-REPORT with 'failure' status. These images will be retransmitted when the PaxPort is powered-up again.

#### 2.2.1.3.2.2 Proposed Presentation Contexts

Table 2:10 Presentation Contexts Proposed by Paxport

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Storage Commitment Push	1.2.840.10008.1.20.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

### 2.2.1.3.2.3 Specific Conformance for SC Image Storage SOP Class

The Paxport AE supports sending the following DIMSE Services:

— C-STORE

#### 2.2.1.3.2.3.1.1 Supported DICOM Elements and Status codes for C-STORE

Paxport supports the following standard DICOM attributes for this SOP Class as an SCU.

**Table 2:11 C-Store SCU standard DICOM attributes.**

Module	Attribute Name	Group, Tag	Default Value
Patient	Patient's Name	0010,0010	
	Patient ID	0010,0020	
	Patient's Birth Date	0010,0030	
	Patient's Sex	0010,0040	
General Study	Study Instance UID	0020,000D	
	Study Date	0008,0020	
	Study time	0008,0030	
	Referring physician's name	0008,0090	
	Study ID	0020,0010	
	Accession Number	0008,0050	
	Study Description	0008,1030	
	Name of physician reading study (Radiologist)	0008,1060	
Referenced Study Sequence	0008,1110	IHE	
Patient Study			Not supported
General Series	Modality	00058,0060	
	Series Instance UID	0020,000E	
	Series Number	0020,0011	
	Laterality	0020,0060	
	Performing Physician's Name	0008,1050	
	Protocol Name	0018,1030	PROTOCOL IHE
	Series description (exam subtype)	0008,103E	
	Referenced Study Component Sequence	0008,1111	IHE
	Requested Attributes Sequence	0040,0275	IHE
	Performed Procedure Step ID	0040,0253	IHE
	Performed Procedure Step Start Date	0040,0244	IHE
	Performed Procedure Step Start Time	0040,0245	IHE
	Performed Procedure Step Description	0040,0254	IHE
Performed Action Item Code Sequence	0040,0260	IHE	
General Equipment	Manufacturer	0008,0070	Note 1
	Institution's Name (Institution ID, Hospital name)	0008,0080	Note 1
	Institution Address	0008,0081	Note 1
	Station Name	0008,1010	Note 1
	Institutional Department Name	0008,1040	Note 1
	Manufacturer's Model Name	0008,1090	Note 1
SC Equipment	Conversion Type	0008,0064	DV Note 1
	Modality	0008,0060	Note 1
	Secondary Capture Device ID	0018.1010	4416 Note 1
	Secondary Capture Device Manufacturer	0018.1016	AGFA Note 1
	Secondary Capture Device Manufacturers Model Name	0018.1018	PAXPORT Note 1
	Secondary Capture Device software Version	0018.1019	PAXX.X.X Note2

Module	Attribute Name	Group, Tag	Default Value
General Image	Image Number	0020,0013	
	Patient Orientation	0020,0020	
	Content Date	0008,0023	
	Content Time	0008,0033	
	Lossy Image Compression	0028,2110	
Image Pixel	Samples per pixel	0028,0002	1
	Photometric Interpretation	0028,0004	
	Planar Configuration	0028,0006	Note 3
	Rows	0028,0010	
	Columns	0028,0011	
	Pixel Aspect Ratio	0028,0034	Note 4
	Bits Allocated	0028,0100	
	Bits Stored	0028,0101	
	High Bit	0028,0102	
	Pixel Representation	0028,0103	
	Pixel Data	7FE0,0010	
SC Image	Date of Secondary Capture	0018,1012	
	Time of Secondary Capture	0018,1014	
Overlay Plane			Not supported
VOI LUT	Window Center	0028,1050	127.5 Note 5
	Window Width	0028,1051	255 Note 5
SOP Common	SOP Class UID	0008,0016	1.2.840.10008.5.1.4.1.1.7
	SOP Instance UID (Unique identifier)	0008,0018	
	Specific Character Set	0008,0005	See section 4 Support for Extended Character Sets
	Instance Creation Date	0008,0012	
	Instance Creation Time	0008,0013	

**Notes:**

1. This value can be modified by Service.
2. Actual software version and is not editable.
3. Planar Configuration (0028,0006) is required if Samples per Pixel (0028,0002) has a value greater than 1
4. Pixel Aspect Ratio (0028,0034) is required if the aspect ratio is not 10000/10000
5. If Window Width/Center is different from default, it will be processed on the image before it will be sent.

Paxport supports the standard DICOM response status codes for this SOP Class as an SCU.

**Table 2:12 Storage C-STORE Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
----------------	-----------------	-------------------------	--------

Success	Success	0000	The image was stored successfully on the SCP system. The PAXPORT SC Image Storage Component will send a C-STORE for the next study.
Refused	Out of Resources	A700-A7FF	Status message will be logged by the PAXPORT SC Image Storage Component. The PAXPORT SC Image Storage Component will retry a C-STORE command for this study, until success or a status different from A7xxH is returned.
Error	Data Set does not match SOP Class	A900-A9FF	Indicates that the Data Set does not encode an instance of the SOP Class specified according to the SCP. Status message will be logged by the PAXPORT SC Image Storage Component. The PAXPORT SC Image Storage Component will stop sending C-STORE commands for this study.
Error	Can not understand	C000-CFFF	Indicates that the Data Set could not be parsed into elements by the SCP. Status message will be logged by the PAXPORT SC Image Storage Component. The PAXPORT SC Image Storage Component will stop sending C-STORE commands for this study.
Warning	Coercion of Data Elements	B000	Status message will be logged by the PAXPORT SC Image Storage Component. The PAXPORT SC Image Storage Component will send a C-STORE command for the next study.
Warning	Elements discarded	B006	Status message will be logged by the PAXPORT SC Image Storage Component. The PAXPORT SC Image Storage Component will send a C-STORE command for the next study.
Warning	Data set does not match SOP Class	B007	Status message will be logged by the PAXPORT SC Image Storage Component. The PAXPORT SC Image Storage Component will send a C-STORE command for the next study.
Failure	Failure	Any other status code	The Association is aborted using A-ABORT and the send job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application.

### 2.2.1.3.2.4 Specific Conformance for Storage Commitment SOP Class

#### 2.2.1.3.2.4.1.1 Supported DICOM Elements for Storage Commitment

Paxport supports these standard DICOM elements for this SOP Class as an SCU (N-ACTION):

**Table 2-13 N-ACTION SCU standard DICOM attributes.**

Module	Attribute Name	Group, Tag	Default Value
Request Storage Commitment	Transaction UID	0008,1195	
	Referenced SOP Sequence	0008,1199	
	>Referenced SOP Class UID	0008,1150	
	>Referenced SOP Instance UID	0008,1155	
	Referenced Study Component Sequence	0008,1111	
	>Referenced SOP Class UID	0008,1150	
	>Referenced SOP Instance UID	0008,1155	

Paxport supports these standard DICOM elements for this SOP Class as an SCU (N-EVENT-REPORT):

**Table 2-14 N-EVENT-REPORT SCU standard DICOM attributes.**

Module	Attribute Name	Group, Tag	Default Value
Storage Commitment Request Successful	Transaction UID	0008,1195	
	Retrieve AE-Title	0008,0054	
	Referenced SOP Sequence	0008,1199	
	>Referenced SOP Class UID	0008,1150	
	>Referenced SOP Instance UID	0008,1155	
Storage Commitment Request Complete (Failure)	Transaction UID	0008,1195	
	Referenced SOP Sequence	0008,1199	
	>Referenced SOP Class UID	0008,1150	
	>Referenced SOP Instance UID	0008,1155	
	Failed SOP Sequence	0008,1198	
	>Referenced SOP Class UID	0008,1150	
	>Referenced SOP Instance UID	0008,1155	

### 2.2.1.3.3 Activity- Send Images to External Print AE

#### 2.2.1.3.3.1 Description and Sequencing of Activity

Paxport acting as a Print SCU establishes an association with a remote Print SCP for the purpose of sending images and image presentation data for printing on hard copy medium. Images are acquired via a user keypad or a remote control link and printed according to the configured (and selected) format and destination.

The Paxport Print Management component (SCU) will initiate a separate association for each Film Session.

If the SCP AE rejects the Association, then the PAXPORT issues a warning message. In case of a time-out (e.g. no answer from the SCP AE) or a warning message the request will be retried after at least 20 seconds. In the mean time requests to other destinations will be handled.

The Paxport Print Management Component will accept N-EVENT-REPORT's from the Print SCP but will ignore them.

The Paxport AE attempts to open a new association due to the initiation of a print request by the user.

A typical sequence of DIMSE messages sent over an association between Paxport and a Printer are:

1. Paxport sends an ASSOCIATE-RQ to open an association with the printer.
2. Paxport sends an N-CREATE-RQ on the Film Session SOP Class to create a film session.
3. Paxport sends an N-CREATE-RQ on the Presentation LUT SOP Class to create a Presentation LUT (if supported by the Printer – default is 'ON' and can be configured by Service).
4. Paxport sends an N-CREATE-RQ on the Film Box SOP Class to create a film box linked to the Film Session.
5. Paxport sends an N-SET-RQ on the Image Box SOP Class to transfer image data to the Printer.
6. Paxport sends an N-SET-RQ on the Annotation Box SOP Class (optionally)

7. Paxport sends an N-GET-RQ on the Printer SOP Class to obtain current printer status information. If the Printer reports a status of FAILURE, the print-job will abort.
8. Paxport sends an N-ACTION-RQ on the Film Box SOP Class to instruct the Printer to print the film.
9. Paxport sends an N-DELETE-RQ on the Film Box SOP Class to delete the Film Session SOP Instance.
10. Paxport sends an N-DELETE-RQ on the Presentation LUT SOP Class to delete the Presentation LUT Instance.
11. Paxport sends an N-RELEASE-RQ to close the association with the Printer.

### 2.2.1.3.3.2 Proposed Presentation Contexts

**Table 2-15 Presentation Contexts Proposed by Paxport**

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Annotation Box	1.2.840.10008.5.1.1.15	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Presentation LUT	1.2.840.10008.5.1.1.23	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

### 2.2.1.3.3.3 Specific Conformance to Grayscale Print Management Meta SOP Class

The Paxport supports the following SOP classes as a SCU:

**Table 2-16 SOP CLASSES FOR BASIC GRAYSCALE PRINT MANAGEMENT META SOP CLASS**

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

### 2.2.1.3.3.3.1 Specific Conformance for Basic Film Session SOP Class

The Paxport supports sending the following DIMSE Services:

- N-CREATE
- N-ACTION

**N-CREATE** is issued by the PAXPORT Print Management Component (SCU) to create a Basic Film Session SOP instance, when an Association has been established. The N-CREATE causes the Basic Film Session (root element) to be created by the SCP AE and its attributes initialized.

**N-ACTION** is issued by the PAXPORT Print Management Component (SCU) to print a Film Session. This means that all subordinate Basic Film Boxes will be assembled into a print job for printing. (The job can therefore contain more than one film.)

#### 2.2.1.3.3.1.1 Supported DICOM Elements and Status codes for N-CREATE:

The Paxport provides the following support for the Film Session attributes sent by the N-CREATE DIMSE service:

**Table 2-17 BASIC FILM SESSION SOP CLASS N-CREATE ATTRIBUTES**

Attribute	Tag	Value	User or Service Configurable?
Copies	(2000,0010)	1	User Selectable
Print Priority	(2000,0020)	LOW, HIGH	User Selectable
Medium Type	(2000,0030)	(Printer Dependent)	Service Configurable
Film Destination	(2000,0040)	PROCESSOR	No
Film Session Label	(2000,0050)	Patient name or Calling AE Title	

The following status codes are recognized in response to N-CREATE:

**Table 2-18 N-CREATE Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Warning	Attribute Value Out of Range	0116	The PAXPORT Print Management Component will continue when its destination is an AGFA printer, but stops (ABORT) when its destination is a non-AGFA printer (might lead to unacceptable image quality).
Warning	Attribute list error	0107	The PAXPORT Print Management Component will continue. A warning message will be printed in the log file.
Failure	Resource Limitation	0213	Resource Limitation is returned by the SCP AE for the Basic Film Session SOP Class to indicate that the requested allocation can temporarily not be provided. The PAXPORT Print Management Component will retry the current print Job.
Failure			If the SCP AE returns any other failure or warning status the PAXPORT Print Management Component will abort the association.

### 2.2.1.3.3.3.1.2 Supported Status codes for N-ACTION:

The Paxport issues an N-ACTION to print a Film Session.

The following status codes are recognized in response to N-ACTION:

**Table 2-19 N-ACTION Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Failure	Failure		If the SCP AE returns any other error or warning status than described in this table, the Paxport will abort the association.

### 2.2.1.3.3.3.2 Specific Conformance for Basic Film Box SOP Class

The Paxport provides support for the following DIMSE Services:

- N-CREATE
- N-ACTION
- N-DELETE

**N-CREATE** is issued by the PAXPORT Print Management Component (SCU) to create a Basic Film Box under the created Film Session and initialize its attributes. (The creation of a Basic Film Box also causes the subordinate Basic Image Boxes to be created for each location in the film format.) The Basic Film Box contains the presentation parameters common for all images on a given sheet of film.

**N-ACTION** is issued by the PAXPORT Print Management Component (SCU) to print the hierarchy from the Basic Film Box level. This means that the Basic Film Box will be assembled into a print job for printing. The print job will therefore contain one or more copies of a single film of the Film Session, when all desired Image Boxes in the Basic Film Box have been set.

### 2.2.1.3.3.3.2.1 Supported DICOM Elements and Status codes for N-CREATE:

The Paxport provides the following support for the Basic Film Box attributes sent by the N-CREATE DIMSE service:

**Table 2-20 Basic Film BOX SOP Class N-CREATE Attributes**

Attribute	Tag	Value	User or Service Configurable?
Image Display Format	(2010,0010)	<b>STANDARD, ROW, COL, SLIDE, SUPERSLIDE</b>	Service Configurable User Selectable
Annotation Display Format ID	(2010,0030)	See Note 1.	
Film Orientation	(2010,0040)	<b>PORTRAIT LANDSCAPE</b>	Service Configurable
Film Size ID	(2010,0050)	Printer Dependent. See Note 2.	Service Configurable User Selectable
Border Density	(2010,0100)	<b>BLACK</b> or density in hundredths of OD.	Service Configurable

Attribute	Tag	Value	User or Service Configurable?
Empty Image Density	(2010,0110)	<b>BLACK</b> or density in hundredths of OD.	Service Configurable
Minimum Density	(2010,0120)	The desired density in hundredths of OD.	Service Configurable
Maximum Density	(2010,0130)	The desired density in hundredths of OD.	Service Configurable
Trim	(2010,0140)	<b>NO, YES</b>	Service Configurable
Configuration Information	(2010,0150)	Printer Dependent. See Note 3.	Service Configurable
Illumination	(2010,015E)	<b>2000</b> (Transmissive Film) <b>150</b> (Reflective Film)	Service Configurable
Reflective Ambient light	(2010,0160)	<b>10</b>	Service Configurable

### Notes:

1. In case of Agfa printer, Annotation Display Format ID (2010,0030) is supported when the Annotation SOP Class is accepted during Association set-up (cfr. SOP specific Conformance to Basic Annotation Box SOP Class). In case of non-Agfa printers, Annotation Display Format ID (2010,0030) can be edited via the browser.
2. It is possible to select an undefined Film Size ID. In that case AGFA printers will take whatever Film Size that is available in the tray.
3. In case of Agfa printer, Configuration Information (2010,0150) is used to define the Perception LUT and the Color Separation Table. The individual parameters defined are separated by the "\" (BACKSLASH) character. In case of non-Agfa printers, this field can be filled-in via the system configurator.

#### ➤ Perception LUT Supported values:

PERCEPTION_LUT=LINEAR	Linear Perception LUT
PERCEPTION_LUT=KANAMORI	Kanamori Perception LUT
PERCEPTION_LUT=n	LUT defined by value 'n', n is of VR type IS.
PERCEPTION_LUT=OEMxxx	OEM LUT table no xxx is used, which is available in the printer.

When "PERCEPTION\_LUT=n" is used, 'n' is defined in the range 75 to 220 as follows:

<u>n</u>	<u>Meaning</u>
100	Exact Kanamori Curve (same as "PERCEPTION_LUT=KANAMORI")
200	Exact Linear Curve (same as "PERCEPTION_LUT=LINEAR")
100..200	Curve between Kanamori and Linear
< 100	Hyper-Kanamori Curve
> 200	Hypo-Linear Curve

The Perception LUT is not used for color images or when PLUT Values are sent.

#### ➤ Color Separation table

Supported values:

CS\_TABLE = n                      n is defined in the range 0...18.

Color Separation is used to choose the Color Separation Table in the Drystar, Agfa's Thermal Sublimation Printer.

The Color Separation Table (CS\_TABLE) is only used for color images. Minimum Density Value, Maximum Density Value and Perception LUT are ignored for color images.

The following status codes are recognized in response to a N-CREATE:

**Table 2-21 N-CREATE Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Warning	Attribute Value Out of Range	0116	The PAXPORT Print Management Component will continue when its destination is an AGFA printer, but stops (ABORT) when its destination is a non-AGFA printer (might lead to unacceptable image quality).
Warning	Attribute list error	0107	The PAXPORT Print Management Component will continue. A warning message will be printed in the log file.
Failure	Failure		If the SCP AE returns any other error or warning status, the Paxport will abort the association.

#### 2.2.1.3.3.3.2.2 Basic Film Box SOP Class Operations for N-ACTION

The following status codes are recognized in response to an N-ACTION:

**Table 2-22 N-ACTION Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Failure	Failure		If the SCP AE returns any other error or warning status, the Paxport will abort the association.

#### 2.2.1.3.3.3.3 Specific Conformance for Basic Grayscale Image Box SOP Class

The Paxport provides support for the following DIMSE Services:

— N-SET

**N-SET** is issued by the PAXPORT Print Management Component (SCU) to change some of the Basic Grayscale Image Box attribute values. In Basic Print Management, N-SET is also used to define the Image Module (this contains image related attributes and the actual image pixel data). If no pixel data is supplied with the N-SET, the current Image Module should be deleted from the hierarchy.

When all needed Basic Grayscale Image Boxes have been set, the PAXPORT Print Management Component (SCU) issues a print command. There can be empty image positions. By using N-SET the

PAXPORT Print Management Component (SCU) can instruct the SCP to erase the image in the image position by setting a zero length and no value in the attribute Basic Grayscale Image Sequence.

#### 2.2.1.3.3.3.3.1 Basic Grayscale Image Box SOP Class Operations for N-SET

The Paxport provides the following support for the Basic Grayscale Image Box attributes sent by the N-SET DIMSE service:

**Table 2-23 Basic Grayscale Image Box SOP Class N-SET Attributes**

Attribute	Tag	Value	User or Service Configurable?
Magnification Type	(2010,0060)	<b>REPLICATE, BILINEAR, CUBIC</b> See Note 2.	Service Configurable
Smoothing Type	(2010,0080)	<b>0, 140</b> (Cubic only) See Note 3.	Service Configurable
Image Position	(2020,0010)	1-xx	
Polarity	(2020,0020)	<b>NORMAL, REVERSE</b>	Service Configurable
Basic Grayscale Image Sequence	(2020,0110)	1-xx	
>Samples Per Pixel	(0028,0002)	<b>1</b>	
>Photometric Interpretation	(0028,0004)	<b>MONOCHROME1, MONOCHROME2</b>	
>Rows	(0028,0010)	<b>&gt; 0</b>	
>Columns	(0028,0011)	<b>&gt; 0</b>	
>Pixel Aspect Ratio	(0028,0034)	10000/10000 See Note 1.	
>Bits Allocated	(0028,0100)	<b>8</b>	
>Bits Stored	(0028,0101)	<b>8</b>	
>High Bit	(0028,0102)	<b>7</b>	
>Pixel Representation	(0028,0103)	<b>0</b>	
>Pixel Data	(7FE0,0010)		

#### Notes:

- Pixel Aspect Ratio is only sent when its value differs from the standard value : 10000\10000.
- It is possible to select an undefined Magnification Type. In that case AGFA printers will take Magnification Type that is configured in the printers (configurable per AE title). **"empty string"** can only be used for AGFA printers.
- Smoothing Type (2010,0080) is used if Magnification Type is "CUBIC".  
The following values defined for the Smoothing Type have a special meaning:
  - "0" - Unsharp smoothing
  - "140" - Sharp (Hi-resolution) smoothing

Besides the above-specified standard attributes the 'Basic Grayscale Image Sequence' is also extended with the DICOM attributes listed in Table 2-24 below:

**Table 2-24 N-SET Response Status Codes**

Attribute Name	Tag	Value
>Window Center	(0028,1050)	See Note below
>Window Width	(0028,1051)	See Note below
>Rescale Intercept	(0028,1052)	0.0
>Rescale Slope	(0028,1053)	1.0
>Rescale Type	(0028,1054)	US

**Note:**

Window Center (0028,1050) and Window Width (0028,1051) are not sent. When one or more of following parameters differ from the default, the image will be transformed on the Paxport before transferring it to the printer. This counts for following parameters:

- Window Center and Window Width result in a different from the complete data range.
- Image needs to be rotated and/or flipped
- Image cropping is needed

The following status codes are recognized in response to an N-SET:

**Table 2-25 N-SET Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Warning	Attribute out of range	0116	The PAXPORT Print Management Component will continue when its destination is an AGFA printer, but stops (ABORT) when its destination is a non-AGFA printer (might lead to unacceptable image quality).
Warning	Attribute list error	0107	The PAXPORT Print Management Component will continue. A warning message will be printed in the log file.
Failure	Insufficient memory in the printer to store the images	C605	The PAXPORT Print Management Component will retry the current Print Job.
Failure	Failure		If the SCP AE returns any other error or warning status, the Paxport will abort the association.

### 2.2.1.3.3.3.4 Specific Conformance for Printer SOP Class

The Paxport provides support for the following DIMSE Services:

- N-GET
- N-EVENT-REPORT

**N-EVENT-REPORT:** at any time during the Association, the PAXPORT Print Management Component (SCU) is able to accept the N-EVENT-REPORT from the SCP AE, but will not use it in the application software.

**N-GET** is issued by the PAXPORT Print Management Component (SCU) to retrieve an instance of the Printer SOP class.

#### 2.2.1.3.3.3.4.1 Printer SOP Class Operations for N-GET

The Paxport uses the Printer SOP Class N-GET operation to obtain information about the current printer status.

#### 2.2.1.3.3.3.4.2 Supported DICOM Elements and Status codes for N-GET

**Table 2-26 Printer SOP Class N-GET Request Attributes**

Attribute	Tag	Valid Range
Manufacturer	(0008,0070)	Provided by printer
Manufacturer's Model Name	(0008,1090)	Provided by printer
Device Serial Number	(0018,1000)	Provided by printer
Software Version	(0018,1020)	Provided by printer
Date of Last Calibration	(0018,1200)	Provided by printer
Time of last Calibration	(0018,1201)	Provided by printer
Printer Status	(2110,0010)	<b>NORMAL</b> <b>WARNING</b> <b>FAILURE</b>
Printer Status Info	(2110,0020)	See Conformance Statement printer
Printer Name	(2110,0030)	Provided by printer

**Table 2-27 N-GET Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Failure	Failure		If the SCP AE returns any other error status, the Paxport will abort the association.

### 2.2.1.3.3.4 Specific Conformance for Basic Color Print Management Meta SOP Class

The Paxport supports the following SOP classes as a SCU:

**Table 2-28 SOP CLASSES FOR BASIC COLOR PRINT MANAGEMENT META SOP CLASS**

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Color Image Box	1.2.840.10008.5.1.1.4.1	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

#### 2.2.1.3.3.4.1 Specific Conformance for Basic Film Session SOP Class

Refer to the Basic Film Session SOP Class for Basic Grayscale Print Management.

#### 2.2.1.3.3.4.2 Specific Conformance for Basic Film Box SOP Class

Refer to the Basic Film Box SOP Class for Basic Grayscale Print Management.

#### 2.2.1.3.3.4.3 Specific Conformance for Basic Color Image Box SOP Class

The Basic Color Image Box SOP instance is created by the SCP AE at the time the Basic Film Box SOP instance is created (N-CREATE). The Basic Color Image Box contains the presentation parameters and image pixel data that apply to a single image of a sheet of film.

The Paxport provides support for the following DIMSE Service:

— N-SET

**N-SET** is issued by the PAXPORT Print Management Component (SCU) to change some of the Basic Color Image Box attribute values. In Basic Print Management, N-SET is also used to define the Image Module (this contains image related attributes and the actual image pixel data). If no pixel data is supplied with the N-SET, the current Image Module is deleted from the hierarchy.

When all needed Basic Color Image Boxes have been set, the PAXPORT Print Management Component can issue a print command. There can be empty image positions. By using N-SET the PAXPORT Print Management Component can instruct the SCP to erase the image in the image position by setting a zero length and no value in the attribute Basic Color Image Sequence.

##### 2.2.1.3.3.4.3.1 Basic Color Image Box SOP Class Operations for N-SET

The Paxport provides the following support for the Basic Color Image Box attributes sent by the N-SET DIMSE service:

**Table 2-29 Basic Color Image Box SOP Class N-SET Attributes**

Attribute	Tag	Value	User or Service Configurable?
Image Position	(2020,0010)	1-xx	
Polarity	(2020,0020)	<b>NORMAL, REVERSE</b>	Service Configurable

Attribute	Tag	Value	User or Service Configurable?
Requested Image Size	(2020,0030)		
Basic Color Image Sequence	(2020,0111)	1-xx	
>Samples Per Pixel	(0028,0002)	<b>3</b>	
>Photometric Interpretation	(0028,0004)	<b>RGB</b>	
>Planar Configuration	(0028,0006)		
>Rows	(0028,0010)	<b>&gt; 0</b>	
>Columns	(0028,0011)	<b>&gt; 0</b>	
>Pixel Aspect Ratio	(0028,0034)	Only sent if not: 10000/10000	
>Bits Allocated	(0028,0100)	<b>8</b>	
>Bits Stored	(0028,0101)	<b>8</b>	
>High Bit	(0028,0102)	<b>7</b>	
>Pixel Representation	(0028,0103)	<b>0</b>	
>Pixel Data	(7FE0,0010)		

The following status codes are recognized in response to an N-SET:

**Table 2-30 N-SET Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Warning	Attribute out of range	0116	The PAXPORT Print Management Component will continue when its destination is an AGFA printer, but stops (ABORT) when its destination is a non-AGFA printer (might lead to unacceptable image quality).
Warning	Attribute list error	0107	The PAXPORT Print Management Component will continue. A warning message will be printed in the log file.
Failure	Insufficient memory in the printer to store the images	C605	The PAXPORT Print Management Component will retry the current Print Job.
Failure	Failure		If the SCP AE returns any other error or warning status, the Paxport will abort the association.

#### 2.2.1.3.3.4.4 Specific Conformance for Printer SOP Class

Refer to the Printer SOP Class for Basic Grayscale Print Management.

#### 2.2.1.3.3.5 Specific Conformance to Basic Annotation SOP Class

The Paxport provides support for the following DIMSE Services:

— N-SET

**N-SET** is used by the PAXPORT Print Management Component (SCU) to update the Basic Annotation Box SOP Instance. The PAXPORT Print Management Component (SCU) can set all Basic Annotation Box Instances.

#### 2.2.1.3.3.5.1.1 Basic Annotation SOP Class Operations for N-SET

The Paxport provides the following support for the Basic Annotation SOP Class attributes sent by the N-SET DIMSE service:

**Table 2-31 Basic Annotation SOP CLASS N-SET Request Attributes**

Attribute	Tag	Value	User or Service Configurable?
Annotation Position	(2030,0010)	1-6	Service Configurable
Text String	(2030,0020)		Service Configurable

#### 2.2.1.3.3.6 Specific Conformance to Presentation LUT SOP Class

The Paxport provides support for the following DIMSE Services:

- N-CREATE
- N-DELETE

**N-CREATE** is issued by the PAXPORT Print Management Component (SCU) to create a Presentation LUT SOP Instance.

#### 2.2.1.3.3.6.1.1 Presentation LUT SOP Class Operations for N-GET

The Paxport provides the following support for the Presentation LUT SOP Class attributes sent by the N-CREATE DIMSE service:

**Table 2-32 Presentation LUT SOP CLASS N-CREATE Request Attributes**

Attribute	Tag	Value	User or Service Configurable?
Presentation LUT Sequence	(2050,0010)		
>LUT Descriptor	(0028,3002)	<b>256</b> (8bit/pixel) (LUT Entry Count) <b>0</b> (LUT First Pixel Value Mapped) <b>15</b> (LUT Bits Count)	No (=fixed)
>LUT Explanation	(0028,3003)		
>LUT Data	(0028,3006)		
Presentation LUT Shape	(2050,0020)	<b>IDENTITY</b> (Note)	

**Note:**

'Presentation LUT Shape' is not supported

**Table 2-33 N-CREATE Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Warning	Attribute Value Out of Range	0116	The PAXPORT Print Management Component will continue without P Luts.
Warning	Requested Min or max density out of range	B605	The PAXPORT Print Management Component will continue without P Luts.
Error	Error		If the SCP AE returns any other error or warning status the PAXPORT Print Management Component will continue without P Luts.

### 2.2.1.3.4 Activity- Send MPPS to MPPS Manager

#### 2.2.1.3.4.1 Description and Sequencing of Activity

The Paxport initiates an association when opening a study.

The Paxport sends a N-Create.

The Paxport closes the association.

The Paxport attempts to initiate an association when canceling or closing a study.

The Paxport sends a N-SET

The Paxport closes the association.

#### 2.2.1.3.4.2 Proposed Presentation Contexts

**Table 2-34 Presentation Contexts Proposed by Paxport**

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

#### 2.2.1.3.4.3 Specific Conformance for MPPS SOP Class

The Paxport supports sending the following DIMSE Services:

- N-CREATE
- N-SET

## 2.2.1.3.4.3.1.1 Supported DICOM Elements and Status codes for N-CREATE and N-SET:

**Table 2-35 MPPS SOP CLASS N-CREATE and N-SET Request Attributes.**

Module	Attribute Name	Group, Tag	Remarks
Performed Procedure Step Relationship	Scheduled Step Attribute Sequence	0040,0270	
	>Study Instance UID	0020,000D	From MWL when retrieved, but generated by the equipment when not provided by MWL or when several SPS belonging to different Requested Procedures are satisfied by one PPS
	>Referenced Study Sequence	0008,1110	From MWL when retrieved. Zero length when PPS is unscheduled
	>>Referenced SOP Class UID	0008,1150	
	>>Referenced SOP Instance UID	0008,1155	
	>Accession Number	0008,0050	From MWL when retrieved. Zero length when PPS is unscheduled
	>Placer Order Number/Imaging Service Request	0040,2006	From MWL when retrieved
	>Filler Order Number/Imaging Service Request	0040,2007	From MWL when retrieved
	>Requested Procedure ID	0040,1001	From MWL when retrieved
	>Requested Procedure Description	0032,1060	From MWL when retrieved.
	>Placer Order Number/Procedure	0040,1007	From MWL when retrieved
	>Scheduled Procedure Step ID	0040,0009	From MWL when retrieved
	>Scheduled Procedure Step Description	0040,0007	From MWL when retrieved
	>Scheduled Action Item Code Sequence	0040,0008	From MWL when retrieved, except when changed by operator
	>>Code Value	0008,0100	
	>>Coding Scheme Designator	0008,0102	
	>>Code Meaning	0008,0104	
	Patient's name	0010,0010	From MWL when retrieved
	Patient ID	0010,0020	From MWL when retrieved
	Patient's birth date	0010,0030	From MWL when retrieved
	Patient's sex	0010,0040	From MWL when retrieved

Module	Attribute Name	Group, Tag	Remarks
Performed Procedure Step Information	Performed Procedure Step ID	0040,0253	Equated to the Scheduled Procedure Step ID from the MWL when retrieved, otherwise generated by the equipment.
	Performed Station AE –Title	0040,0241	
	Performed Station Name	0040,0242	
	Performed Location	0040,0243	
	Performed Procedure Step Start Date	0040,0244	Date of the N-Create of the MPPS
	Performed Procedure Step Start Time	0040,0245	Time of the N-Create MPPS
	Performed Procedure Step Status	0040,0252	
	Performed Procedure Step Description	0040,0254	Equated to the Scheduled Procedure Description from MWL when retrieved, except when unscheduled or changed by the operator.
	Performed Procedure Type Description	0040,0255	
	Procedure Code Sequence	0008,1032	Equated to Requested Procedure Code Sequence; set to zero length if Performed Action Item Code differs from the scheduled one.
	>Code Value	0008,0100	
	>Coding Scheme Designator	0008,0102	
	>Code Meaning	0008,0104	
	Performed Procedure Step End Date	0040,0250	Date of approval of the Performed Procedure Step
	Performed Procedure Step End Time	0040,0251	Time of approval of the Performed Procedure Step.
Image Acquisition Results	Modality	0008,0060	
	Study ID	0020,0010	Equated to the Requested Procedure ID from the MWL when retrieved except when unscheduled or SPS grouped in one PPS, then it's equipment generated.
	Performed Action Item Code Sequence	0040,0260	
	>Code Value	0008,0100	
	>Coding Scheme Designator	0008,0102	
	>Code Meaning	0008,0104	
	Performed Series Sequence	0040,0340	
	>Performing Physician's Name	0008,1050	

Module	Attribute Name	Group, Tag	Remarks
	>Protocol Name	0018,1030	
	>Operator's Name	0008,1070	
	>Series Instance UID	0020,000E	
	>Series Description	0008,103E	
	>Retrieve AE-Title	0008,0054	
	>Referenced Image Sequence	0008,1140	
	>>Referenced SOP Class UID	0008,1150	
	>>Referenced SOP Instance UID	0008,1155	
	>Referenced Standalone SOP Instance Sequence	0040,0220	

**Table 2-36 N-CREATE and N-SET RQ Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.
Error	Performed Procedure	0110	An N-SET is performed after the Performed Procedure was Completed.

### 2.2.1.3.5 Activity- Get Worklist from External AE

#### 2.2.1.3.5.1 Description and Sequencing of Activity

The Paxport AE attempts to initiate a new association due to two Real-World activities:

- Worklist oriented query manually initiated by the User (Keypad).
- Worklist oriented query automatically initiated by the Paxport.

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

Paxport sends a ASSOCIATE-RQ

Paxport sends a C-FIND-RQ

#### 2.2.1.3.5.2 Proposed Presentation Contexts

**Table 2-37 Presentation Contexts Proposed by Paxport**

Abstract Syntax	Transfer Syntax	Role	Extended
-----------------	-----------------	------	----------

Name	UID	Name	UID		
Modality Worklist	1.2.840.10008.5.1.4.31	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

### 2.2.1.3.5.3 Specific Conformance for Modality Worklist Information Model SOP Class

Paxport provides standard conformance to the DICOM Basic **Worklist Management** Service Class.

The Paxport supports sending the following DIMSE Services:

— C-FIND RQ

PAXPORT supports the Broad Query. A wildcard "\*" is always appended to the Patient's Name components.

The Query keys for the Broad Query are listed in below:

**Table 2-38 MWL Keys for Broad Worklist Query**

Matching Key Attribute Name	Tag
Patient Name	(0010,0010)
Scheduled Procedure Step Sequence	(0040,0100)
> Scheduled Station AE Title	(0040,0001)
> Scheduled Procedure Step Start Date	(0040,0002)
> Scheduled Procedure Step Status	(0040,0020)

#### 2.2.1.3.5.3.1.1 Supported DICOM Elements and Status codes for C-FIND

##### 2.2.1.3.5.3.1.1.1 Worklist Oriented Query Selection

The following values are used as matching attributes in the Worklist Oriented Query:

Query Keys Matching

- **SV** Single valued match
- **RM** Range Matching
- **SM** Sequence Matching

Paxport requests the following elements be returned for this SOP class:

**Table 2-39 Modality Worklist SOP CLASS C-FIND Request Attributes**

Module	Attribute Name	Tag	Match
SOP Common	Specific Character Set	(0008,0005)	SV
Scheduled Procedure Step	Scheduled Procedure Step Sequence	(0040,0100)	SM
	> Scheduled Station AE Title	(0040,0001)	SV or Zero length
	> Scheduled Procedure Step Start Date	(0040,0002)	SV or RM

Module	Attribute Name	Tag	Match
	> Scheduled Procedure Step Start Time	(0040,0003)	Zero length
	> Modality	(0008,0060)	SV or 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
	> Scheduled Action Item Code Sequence	(0040,0008)	Zero length
	>> Code Value	(0008,0100)	---
	>> Code Scheme Designator	(0008,0102)	---
	>> Code Scheme Version	(0008,0103)	---
	>> Code Meaning	(0008,0104)	---
	> Pre Medication	(0040,0012)	Zero-length
	> Scheduled Procedure step ID	(0040,0009)	Zero-length
	> Scheduled Procedure Step Status	(0040,0020)	Zero-length
	> Requested Contrast Agent	(0032,1070)	Zero-length
Requested Procedure	Requested Procedure ID	(0040,1001)	SV or Zero-length
	Requested Procedure Description	(0032,1060)	Zero-length
	Requested Procedure Code Sequence	(0032,1064)	Zero-length
	> Code Value	(0008,0100)	--
	> Coding Scheme Designator	(0008,0102)	--
	> Coding Scheme Version	(0008,0103)	--
	> Code Meaning	(0008,0104)	--
	Study Instance UID	(0020,000D)	Zero-length
	Referenced Study Sequence	(0008,1110)	Zero-length
	> 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)	SV or Zero-length
	Imaging Service Request Comments	(0040,2400)	Zero-length
	Requesting Physician	(0032,1032)	Zero-length
	Referring Physician's Name	(0008,0090)	Zero-length
	Requesting Service	(0032,1033)	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)	Zero-length
	> Referenced SOP Class UID	(0008,1150)	--
	> Referenced SOP Instance UID	(0008,1155)	--
Patient Identification	Patient's Name	(0010,0010)	SV with wildcard (*) or Zero-length
	Patient ID	(0010,0020)	SV or Zero-length
	Other Patient Ids	(0010,1000)	Zero-length
Patient Demographic	Patient's Birth Date	(0010,0030)	Zero-length
	Patient's Birth Time	(0010,0032)	Zero-length
	Patient's Sex	(0010,0040)	Zero-length
	Patient's Weight	(0010,1030)	Zero-length
	Military Rank	(0010,1080)	Zero-length

Module	Attribute Name	Tag	Match
	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 Comments	(0010,4000)	Zero-length
Patient Medical	Patient State	(0038,0500)	Zero-length
	Pregnancy Status	(0010,21C0)	Zero-length
	Medical Alerts	(0010,2000)	Zero-length
	Contrast Allergies	(0010,2110)	Zero-length
	Special Needs	(0038,0050)	Zero-length
	Additional Patient History	(0010,21B0)	Zero-length

**Table 2-40 C-FIND Response Status Codes**

Service Status	Further Meaning	Status Code (0000,0900)	Reason
Success	Success	0000	Operation successfully completed.

### 2.2.1.4 Association Acceptance Policies

The Paxport AE does not accept associations.

## 2.3 Network Interfaces

Paxport Version 4.x provides DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the DICOM Standard.

### 2.3.1 Physical Medium Support

Paxport Version 4.x supports 10Base 2, 10BaseT and 100BaseT. This is automatically configured via a detection mechanism and is galvanically isolated for IEC601 compliance.

## 2.4 Configuration

### 2.4.1 AE Title/ Presentation Mapping

#### 2.4.1.1 Local AE Titles

**Table 2-41 AE Title Configuration Table**

Application Entity	Default AE Title	Default TCP/IP Port
Paxport	(Service configurable)	104 (Service configurable)

## **2.4.2 Configuration Parameters**

### **2.4.2.1 General configuration Parameters**

The following parameters are configurable via Service:

Local IP Address, Netmask and Gateway

### **2.4.2.2 Paxport AE**

All Paxport system configurations are performed by Service.

### **3 MEDIA INTERCHANGE**

The Paxport Version 4.x does not support DICOM Media Interchange.

## 4 SUPPORT FOR EXTENDED CHARACTER SETS

Paxport Version 4.x supports the following character sets:

**Table 4:1 Paxport supported Character Sets**

ISO_IR 6	Default repertoire
ISO_IR 100	Latin alpabet No. 1
ISO_IR 101	Latin alpabet No. 2
ISO_IR 109	Latin alpabet No. 3
ISO_IR 110	Latin alpabet No. 4
ISO_IR 144	Cyrillic
ISO_IR 127	Arabic
ISO_IR 126	Greek
ISO_IR 138	Hebrew
ISO_IR 148	Latin alpabet No. 5
ISO_IR 13	Japanese
ISO 2022 IR 6	Default repertoire
ISO 2022 IR 100	Latin alpabet No. 1
ISO 2022 IR 101	Latin alpabet No. 2
ISO 2022 IR 109	Latin alpabet No. 3
ISO 2022 IR 110	Latin alpabet No. 4
ISO 2022 IR 144	Cyrillic
ISO 2022 IR 127	Arabic
ISO 2022 IR 126	Greek
ISO 2022 IR 138	Hebrew
ISO 2022 IR 148	Latin alpabet No. 5
ISO 2022 IR 13	Japanese Katakana and Romaj
ISO 2022 IR 87	Japanese Kanji
ISO 2022 IR 159	Japanese Supplementary Kanji
ISO 2022 GB2312	Chinese Guo Biao 2312-80
ISO 2022 B5	Chinese Big5
ISO 2022 GBK	Chinese Guo Biao 2312-80
ISO 2022 IR 149	Korean KSX1001

### Note:

A combination of multiple character sets can be needed, e.g. Japanese Katakana and Kanji. Entering string: "\ISO 2022 IR 13\ISO 2022 IR 87". The first "\" in the string represents ISO\_IR6.

All character sets having the prefix "ISO 2022" indicate the presence of Code Extension (like Escape characters)

## 5 SECURITY

### 5.1 IHE Security Profile

The Paxport Version 4.x supports the Authentication, Accountability, and User Authentication IHE Security Profiles. The Security Administrator sets the configurations for Security Profiles.

#### 5.1.1 Authentication

The Paxport Version 4.x can be configured to communicate using Transport Layer Security (TLS). The default port for TLS is 2763 (Service configurable).

#### 5.1.2 Accountability

The Paxport Version 4.x can be configured to send audit records to an Audit Record Repository.

#### 5.1.3 User Authentication

The Paxport Version 4.x provides users different levels of user interfaces based on their needs.

Interface Type:	Passwords Required?
<b>User Keypad</b>	
User	Yes
Security Administrator	Yes
<b>Service GUI (Network)</b>	
User	Yes
Service	Yes
Security Administrator	Yes

The Security Administrator has the ability to change all passwords.