



NO.	001-00258-00	REV.	D
PAGE:	1 of 47		
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TABLE OF CONTENTS

Para.		Page
0.0	INTRODUCTION.....	7
0.1	DICOM BACKGROUND.....	7
0.2	ACRONYMS AND ABBREVIATIONS.....	7
1.0	IMPLEMENTATION MODEL.....	7
1.1	Application Data Flow Diagram.....	8
1.2	Functional Definitions of Application Entities.....	9
1.3	Sequencing of Real-World Activities.....	9
2.0	APPLICATION ENTITY (AE) SPECIFICATIONS.....	10
2.1	Basic Grayscale Print Management AE Specification.....	10
2.1.1	Association Establishment Policies.....	10
2.1.1.1	General.....	10
2.1.1.2	Number of Associations.....	10
2.1.1.3	Asynchronous Nature.....	10
2.1.1.4	Implementation Identifying Information.....	10
2.1.2	Association Initiation by Real-World Activity.....	10
2.1.2.1	Association Initiation by Queued Film Sheet.....	10
2.1.2.1.1	Proposed Presentation Context to a Gray Print SCP.....	11
2.1.2.1.2	SOP Specific Conformance to Basic Gray Print Management META SOP Class.....	11
2.1.2.1.2.1	SOP Specific Conformance to Basic Film Session SOP Class.....	11
2.1.2.1.2.2	SOP Specific Conformance to Basic Film Box SOP Class.....	12
2.1.2.1.2.3	SOP Specific Conformance to Basic Grayscale Image Box SOP Class.....	13
2.1.2.1.2.4	SOP Specific Conformance to Printer SOP Class.....	14
2.2	Basic Color Print Management AE Specification.....	15
2.2.1	Association Establishment Policies.....	15
2.2.1.1	General.....	15
2.2.1.2	Number of Associations.....	15
2.2.1.3	Asynchronous Nature.....	15
2.2.1.4	Implementation Identifying Information.....	15
2.2.2	Association Initiation by Real-World Activity.....	15
2.2.2.1	Association Initiation by Queued Film Sheet.....	16
2.2.2.1.1	Proposed Presentation Context to a Color Print Server.....	16
2.2.2.1.1.1	SOP Specific Conformance to Basic Color Print Management Meta SOP Class.....	16
2.2.2.1.1.1.1	SOP Specific Conformance to Basic Color Image Box SOP Class.....	16
2.3	MODALITY Worklist AE - Specification.....	17
2.3.1	Association Establishment Policies.....	17
2.3.1.1	General.....	17
2.3.1.2	Number of Associations.....	17
2.3.1.3	Asynchronous Nature.....	17
2.3.1.4	Implementation Identifying Information.....	18
2.3.2	Association Initiation by Real World Activity.....	18

2.3.2.1 Association Initiation by Opening New Exam/Worklist Search 18

2.3.2.1.1 Proposed Presentation Context to a Worklist SCP 18

2.3.2.1.2 Modality Worklist Information Attributes 18

2.3.3 Modality Worklist AE Behaviors to SCP Status 19

2.4 Storage Class AE - Specification 20

2.4.1 Association Establishment Policies 20

2.4.1.1 General 20

2.4.1.2 Number of Associations 20

2.4.1.3 Asynchronous Nature 20

2.4.1.4 Implementation Identifying Information 20

2.4.2 Association Initiation by Real-World Activity 21

2.4.2.1 Association Initiation by Queued Image 21

2.4.2.1.1 Proposed Presentation Context to an Archive Server 21

2.4.2.1.1.1 SOP Specific Conformance to Verification SOP Class 23

2.4.2.1.1.2 SOP Specific Conformance to Computed Radiography Image Storage
SOP Class 24

2.4.2.1.1.3 SOP Specific Conformance to Ultrasound Multi-Frame Image Storage SOP
Class 28

2.4.2.1.1.4 SOP Specific Conformance to Retired Ultrasound Multi-frame Image
Storage SOP Class 31

2.4.2.1.1.5 SOP Specific Conformance to Retired Nuclear Medicine Image Storage
SOP Class 32

2.4.2.1.1.6 SOP Specific Conformance to Ultrasound Image Storage SOP Class
..... 34

2.4.2.1.1.7 SOP Specific Conformance to Retired Ultrasound Image Storage SOP
Class 34

2.4.2.1.1.8 SOP Specific Conformance to Secondary Capture Image Storage SOP
Class 35

2.4.2.1.1.9 SOP Specific Conformance to X-ray Angiography Image Storage SOP
Class 36

2.4.2.1.1.10 SOP Specific Conformance to X-Ray Radiofluoroscopic Image Storage
SOP Class 38

2.4.2.1.1.11 SOP Specific Conformance to Multi-frame Grayscale Byte SC Image
Storage SOP Class 39

2.4.2.1.1.12 SOP Specific Conformance to Multi-frame True Color SC Image Storage
SOP Class 40

2.4.3 Storage AE Behaviors to SCP Status 41

2.5 Storage Commitment Service Class 41

2.5.1 Association Establishment Policies 41

2.5.1.1 General 41

2.5.1.2 Number of Associations 41

2.5.1.3 Asynchronous Nature 41

2.5.1.4 Implementation Identifying Information 41

2.5.2 Association Initiation by Real-World Activity 42

2.5.2.1 Proposed Presentation Context to a Storage Commitment SCP 42

2.5.2.1.1 Storage Commitment Information Attributes 42

2.5.3 Storage Commitment AE Behaviors to SCP Status 43

2.6 Modality Performed Procedure Step Service Class 43

2.6.1 Association Establishment Policies 43

2.6.1.1	General	43
2.6.1.2	Number of Associations.....	43
2.6.1.3	Asynchronous Nature	43
2.6.1.4	Implementation Identifying Information	44
2.6.2	Association Initiation by Real-World Activity	44
2.6.2.1	Proposed Presentation Context to a Modality Performed Procedure Step SCP	44
2.6.2.1.1	Modality Performed Procedure Step Information Attributes	44
2.6.3	Modality Performed Procedure Step AE Behaviors to SCP Status	46
3.0	COMMUNICATION PROFILES	47
3.1	TCP/IP Stack Supported	47
3.1.1	Physical Media Supported.....	47
4.0	EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS.....	47
4.1	Standard Extended/Specialized/Private SOPs	47
4.2	Private Transfer Syntaxes	47
5.0	CONFIGURATION	47
5.1	Configurable Parameters	47
6.0	SUPPORT OF EXTENDED CHARACTER SETS	47

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 5 of 47	

LIST OF FIGURES

Para.	Page
Figure 1.1 – Implementation Model	8

LIST OF TABLES

Para.	Page
Table 1.2 – Functional Definitions of Application Entities (AEs).....	9
Table 2.1 – Basic Grayscale Print Management AE Conformance.....	10
Table 2.1.2.1.1 – Printing AE Proposed Presentation Contexts to a Gray Print SCP	11
Table 2.1.2.1.2.1A – Supported DIMSE Services	11
Table 2.1.2.1.2.1B – Supported SOP Class Attributes	11
Table 2.1.2.1.2.2A – Supported DIMSE Services	12
Table 2.1.2.1.2.2B – Supported SOP Class Attributes	12
Table 2.1.2.1.2.3A – Supported DIMSE Services	13
Table 2.1.2.1.2.3B – Supported SOP Class Attributes	13
Table 2.1.2.1.2.4A – Supported DIMSE Services	14
Table 2.1.2.1.2.4B – Supported SOP Class Attributes	14
Table 2.2 – Basic Color Print Management AE Conformance	15
Table 2.2.2.1.1 – Printing AE Proposed Presentation Contexts to a Color Print Server. ...	16
Table 2.2.2.1.1.1.A – Supported DIMSE Services	16
Table 2.2.2.1.1.1.B – Supported SOP Class Attributes	16
Table 2.3 – Modality Worklist AE Conformance	17
Table 2.3.2.1.1 – Modality Worklist AE Proposed Context to Worklist SCP	18
Table 2.3.2.1.2 – Modality Worklist Information Model Attributes	18
Table 2.3.3 – Modality Worklist AE Behavior to Status Returned from SCP	19
Table 2.4 – Storage Class AE Conformance	20
Table 2.4.2.1.1 – Storage AE Proposed Presentation Contexts to a Storage Class SCP .	21
Table 2.4.2.1.1.2A – Computed Radiography Image Storage Modules	24
Table 2.4.2.1.1.2B – Patient Module Attributes	24
Table 2.4.2.1.1.2C – General Study Module Attributes.....	25
Table 2.4.2.1.1.2D – General Series Module Attributes.....	25
Table 2.4.2.1.1.2E – CR Series Module Attributes	26
Table 2.4.2.1.1.2F – General Equipment Module Attribute	26
Table 2.4.2.1.1.2G – General Image Module Attributes.....	26
Table 2.4.2.1.1.2H – Image Pixel Module Attributes.....	27
Table 2.4.2.1.1.2J – CR Image Module Attributes	27
Table 2.4.2.1.1.2K – SOP Common Module Attributes.....	28
Table 2.4.2.1.1.3A – Ultrasound Multi-frame Image Storage Modules.....	28
Table 2.4.2.1.1.3B – US Image Module Attributes.....	29
Table 2.4.2.1.1.3C – Cine Module Attributes.....	30
Table 2.4.2.1.1.3D – Multi-frame Module Attributes.....	31
Table 2.4.2.1.1.4 – (Retired) Ultrasound Multi-frame Image Storage Modules	31

Table 2.4.2.1.1.5A – Nuclear Medicine Image Storage Modules	32
Table 2.4.2.1.1.5B – NM Series Module Attributes	32
Table 2.4.2.1.1.5C – NM Image Module Attributes	33
Table 2.4.2.1.1.6 – Ultrasound Image Storage Modules	34
Table 2.4.2.1.1.7 – Ultrasound Image Storage Modules	34
Table 2.4.2.1.1.8A – Secondary Capture Image Storage Modules	35
Table 2.4.2.1.1.8B – SC Image Equipment Module Attributes	35
Table 2.4.2.1.1.8C – SC Image Module Attributes	36
Table 2.4.2.1.1.9A – X-Ray Angiography Image Storage Modules	36
Table 2.4.2.1.1.9B – X-Ray Image Module Attributes	37
Table 2.4.2.1.1.9C – X-Ray Acquisition Module Attributes	37
Table 2.4.2.1.1.9D – XA Positioner Module Attributes	38
Table 2.4.2.1.1.10 – X-Ray Radiofluoroscopic Image Storage Modules	38
Table 2.4.2.1.1.11A – Multi-frame Grayscale Byte SC Image Storage Modules	39
Table 2.4.2.1.1.11B – Multi-frame Module Attributes	39
Table 2.4.2.1.1.11C – SC Multi-frame Image Module Attributes	40
Table 2.4.2.1.1.12 – Multi-frame True Color SC Image Storage Modules	40
Table 2.4.3 – Storage AE Behavior to Status Returned from SCP	41
Table 2.5 – Storage Commitment Class AE Conformance	41
Table 2.5.2.1 – Proposed Presentation Context to Storage Commitment SCP	42
Table 2.5.2.1.1 – Storage Commitment Request Action Information SCU Attributes	42
Table 2.5.3 – Storage Commitment AE Behavior to Status Returned from SCP	43
Table 2.6 – Modality Performed Procedure Step AE Conformance	43
Table 2.6.2.1 – Proposed Presentation Context to MPPS SCP	44
Table 2.6.2.1.1 – MPPS Information Model Attributes	44
Table 2.6.3 – MPPS AE Behavior to Status Returned from SCP	46

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 7 of 47	

0.0 INTRODUCTION

This document describes the PACSGEAR, Inc. AAM-CA™ acquisition module conformance to the ACR-NEMA DICOM (Digital Imaging and Communications in Medicine) standard and satisfies the DICOM requirements for a vendor conformance specification.

The PACSGEAR, Inc. Acquisition Module (AAM-CA™), known as the DiCOM box®, is a device that captures medical images and sends them via DICOM to central archives and printers.

0.1 DICOM Background

The DICOM information exchange specification provides a definite structure of commands and information that allow for the interoperability of medical imaging devices. Developed by the American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA), the DICOM standard strives to promote communication of image information through the use of a standardized set of command classes and information semantics.

The DICOM standard defines classes of information that are common to many modalities of medical imaging. However, to meet the specific needs of information content for such a diverse range of information, the DICOM specification defines structures for a multitude of medical data. To alleviate the need for applications to implement every aspect of the DICOM specification, a list of conformance tables for every service class was created to define the minimum set of information necessary for data exchanges.

A requirement of the DICOM specification is to maintain a compliance document that outlines a subset of DICOM services and data classes that are supported by an application. The purpose of this document is to define a subset of DICOM for the exchange of medical information with the PACSGEAR, Inc. AAM-CA acquisition module product, the DiCOM box.

This document is written with respect to the ACR-NEMA DICOM version number 3.0.

0.2 Acronyms and Abbreviations

The following acronyms and abbreviations are used in this document.

ACR	American College of Radiology
AE	Application Entity
ANSI	American National Standards Institute
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
IOD	Information Object Definition
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier

1.0 IMPLEMENTATION MODEL

The PACSGEAR, Inc. AAM-CA Acquisition Module is implemented as six Application Entities (AEs):

- Basic Grayscale Print Management SCU AE
- Basic Color Print Management SCU AE
- Storage Class SCU AE
- Modality Worklist SCU AE
- Storage Commitment SCU AE
- Modality Performed Procedure Step SCU AE

The DiCOM box captures analog video or digital images from a variety of modalities and sends them to Print Management and Storage Service Class Providers. Refer to Figure 1.1, Implementation Model, on the following page.

1.1 Application Data Flow Diagram

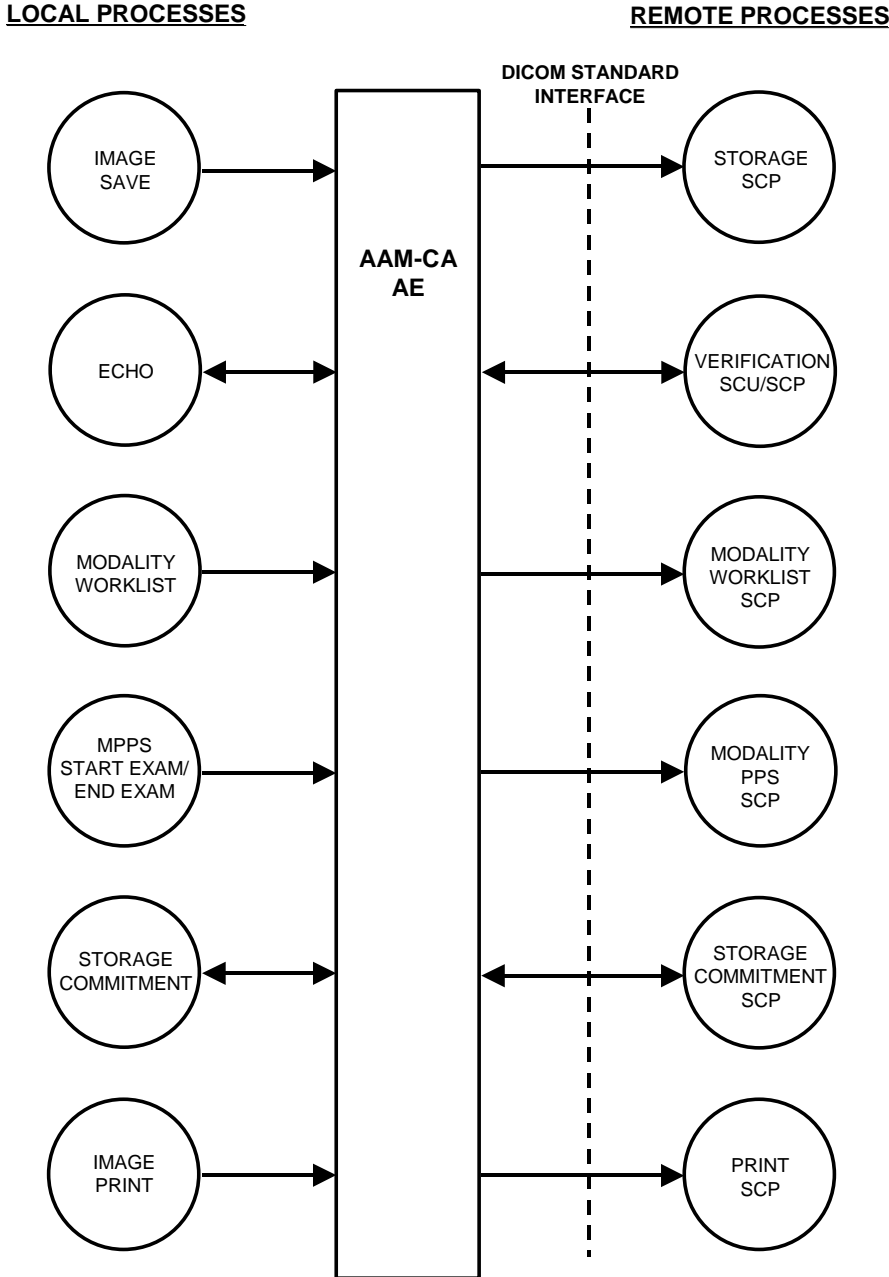


Figure 1.1 – Implementation Model

1.2 Functional Definitions of Application Entities

Table 1.2 – Functional Definitions of Application Entities (AEs)

Type of AE	Definition
Basic Grayscale Print Management AE	Handles all aspects of the Basic Grayscale Print Management SCU.
Basic Color Print Management AE	Handles all aspects of the Basic Color Print Management SCU.
Modality Worklist AE	Acts as a Modality Worklist SCU and handles the worklist query, using selected search keys.
Storage AE	Handles sending images to an archive or workstation server supporting one of the following DICOM SOP Classes in the Storage Class in the role of a SCU. <ul style="list-style-type: none"> • Computed Radiography (CR) • Nuclear Medicine (NM) • Secondary Capture (SC) • Ultrasound (US) • X-Ray Angiographic (XA) • X-Ray Radiofluoroscopic (RF) • Multi-frame Grayscale Byte Secondary Capture • Multi-frame True Color Secondary Capture.
Storage Commitment AE	Acts to request another Application Entity to make the commitment for the safekeeping of images (i.e. that the images will be kept for an implementation specific period of time and can be retrieved). This AE uses the Storage Commitment Push model.
Modality Performed Procedure Step AE	Acts as an SCU to convey the status of a performed procedure step to an information system acting as an SCP.

1.3 Sequencing of Real-World Activities

Real world activities are sequenced as required to meet the definition of the Service Classes. No additional sequencing activity is needed.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 10 of 47	

2.0 APPLICATION ENTITY (AE) SPECIFICATIONS

2.1 Basic Grayscale Print Management AE Specification

The Basic Grayscale Print Management AE provides conformance to the following DICOM SOP classes as a SCU:

Table 2.1 – Basic Grayscale Print Management AE Conformance

SOP Class Name	SOP Class UID	Conformance Level
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Standard
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Standard
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Standard
Basic Gray Image Box SOP Class	1.2.840.10008.5.1.1.4	Standard
Printer SOP Class	1.2.840.10008.5.1.1.16	Standard

2.1.1 Association Establishment Policies

The Basic Grayscale Print Management AE will initiate an association when an entire film sheet has been captured and is ready to print; or when a previously captured film sheet is re-queued for printing.

2.1.1.1 General

Maximum PDU size offered: 32,768 bytes
Maximum PDU size accepted: 65,536 bytes.

2.1.1.2 Number of Associations

The number of simultaneous associations for the Basic Grayscale Print Management AE is one.

Note: The other AEs in this device may be simultaneously active, and thus other associations may be open simultaneously.

2.1.1.3 Asynchronous Nature

The Basic Grayscale Print Management AE will not use asynchronous operations window negotiation.

2.1.1.4 Implementation Identifying Information

Implementation Class UID: "1.2.840.113742.2.20100825"
Implementation Version name: "PACSGEAR V4.30"

Note: "113742" is registered by PACSGEAR, Inc. with ANSI. The class UID and version name above are subject to change in subsequent versions.

2.1.2 Association Initiation by Real-World Activity

The Basic Grayscale Print Management AE will open associations to the Gray Print SCP when a film sheet is ready to be printed.

2.1.2.1 Association Initiation by Queued Film Sheet

The following will cause an association request to be sent to the Gray Print SCP:

- The capture of the last image on a film sheet
- Pressing the End Sheet key with at least one image on a film sheet, or
- Re-queuing a previously captured film sheet, (i.e. Reprint Sheet or Reprint Exam).

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 11 of 47	

2.1.2.1.1 Proposed Presentation Context to a Gray Print SCP

Table 2.1.2.1.1 – Printing AE Proposed Presentation Contexts to a Gray Print SCP

Presentation Context Table					
ABSTRACT SYNTAX		TRANSFER SYNTAX		ROLE	EXTENDED NEGOTIATION
NAME	UID	NAME LIST	UID LIST		
Basic Gray Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.1.2.1.2 SOP Specific Conformance to Basic Gray Print Management META SOP Class

The Basic Grayscale Print Management AE provides standard conformance to the Basic Gray Print Management Meta SOP Class as a SCU. This implies standard conformance for the following:

- Basic Film Session SOP Class
- Basic Grayscale Image Box SOP Class
- Basic Film Box SOP Class
- Printer SOP Class.

Each of these SOP classes is described in the paragraphs to follow.

2.1.2.1.2.1 SOP Specific Conformance to Basic Film Session SOP Class

DICOM specified usage: M = mandatory
U = User option.

Table 2.1.2.1.2.1A – Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Create	M	Creates the film session
N-Set	U	Not used
N-Delete	U	Deletes the film session
N-Action	U	Not used.

Table 2.1.2.1.2.1B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Number of Copies	(2000,0010)	1 to 99	Number of requested copies of film.
Print Priority	(2000,0020)	HIGH MED LOW	Default is MED.
Medium Type	(2000,0030)	PAPER CLEAR FILM BLUE FILM	Range may be restricted by printer.
Film Destination	(2000,0040)	MAGAZINE PROCESSOR	Range may be restricted by printer.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 12 of 47	

Table 2.1.2.1.2.1B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Film Session Label	(2000,0050)	—	Not used.
Memory Allocation	(2000,0060)	—	Not used.

2.1.2.1.2.2 SOP Specific Conformance to Basic Film Box SOP Class

Table 2.1.2.1.2.2A – Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Create	M	Creates the film box.
N-Set	U	Not used.
N-Delete	U	Deletes the film box. Used after each film is printed.
N-Action	M	PRINT. Sent after all images have been transferred for the film box.

Table 2.1.2.1.2.2B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Image Display Format	(2010,0010)	STANDARD\1,1 STANDARD\1,2 STANDARD\2,2 STANDARD\2,3 STANDARD\3,3 STANDARD\3,4 STANDARD\3,5 STANDARD\4,4 STANDARD\4,5 STANDARD\4,6	Range may be further restricted by printer.
Referenced Film Session Sequence	(2010,0500)		Used.
Referenced SOP Class	(0008,1150)	1.2.840.10008 .5.1.1.1	Film Session SOP Class UID.
Referenced SOP Instance UID	(0008,1155)		Referenced Film Session SOP.
Film Orientation	(2010,0040)	PORTRAIT, LANDSCAPE	Range may be further restricted by printer.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 13 of 47	

Table 2.1.2.1.2.2B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Film Size ID	(2010,0050)	8INX10IN 10INX12IN 10INX14IN 11INX14IN 11INX17IN 12INX18IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM 35CMX35CM 35CMX43CM	Range may be further restricted by printer.
Magnification Type	(2010,0060)	REPLICATE, BILINEAR, CUBIC, NONE	Used.
Max Density	(2010,0130)	Limited by printer	Used - Units in hundredths of OD.
Configuration Information	(2010,0150)	Limited by Printer	Used.
Annotation Display Format Id	(2010,0030)		Not used.
Smoothing Type	(2010,0080)		Not used.
Border Density	(2010,0100)	Dmin to Dmax	Used - Units in hundredths of OD, except if equal to Max Avail Density: then BLACK; or if equal to Min Avail Density: then WHITE.
Empty Image Density	(2010,0110)	Dmin to Dmax	Used - Units in hundredths of OD, except if equal to Max Avail Density: then BLACK; or if equal to Min Avail Density: then WHITE.
Min Density	(2010,0120)	Limited by printer	Used - Units in hundredths of OD.
Trim	(2010,0140)	YES, NO	Used.

2.1.2.1.2.3 SOP Specific Conformance to Basic Grayscale Image Box SOP Class

Table 2.1.2.1.2.3A – Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Set	M	An image box instance is created by the SCP for each potential image of the film box. Only the instances that will actually contain images will be updated with the N SET message.

Table 2.1.2.1.2.3B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Image Position	(2020,0010)	1-n	Used.
Basic Grayscale Image Sequence	(2020,0110)		Used.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 14 of 47	

Table 2.1.2.1.2.3B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
>Samples/pixel	(0028,0002)	1	Used.
>Photometric Interpretation	(0028,0004)	MONOCHROME 2	Pixel value 0 = black; 255 = white.
>Rows	(0028,0010)		Image height in pixels.
>Columns	(0028,0011)		Image width in pixels.
>Pixel Aspect Ratio	(0028,0034)	1-32767\1-32767	Row value\Column value.
>Bits Allocated	(0028,0100)	8, 12	8 or 12 bits per sample.
>Bits Stored	(0028,0101)	8, 12	8 or 12 bits per sample.
>High Bit	(0028,0102)	7, 11	Bit 7 or 11 is MSB.
>Pixel Representation	(0028,0103)	0	Unsigned pixel values.
>Pixel Data	(7FE0,0010)		Gray pixel data.
Polarity	(2020,0020)	NORMAL, REVERSE	Specifies whether minimum pixel values are to be printed black or white.
Referenced Overlay Sequence	(2020,0130)		Not used.
>SOP Class UID	(0008,1150)		Not used.
>SOP Instance UID	(0008,1155)		Not used.
Magnification Type	(2010,0060)		Not used. (Set in Basic Film Box.)
Smoothing Type	(2010,0080)		Not used.
Requested Image Size	(2020,0030)		Not used.

2.1.2.1.2.4 SOP Specific Conformance to Printer SOP Class

Table 2.1.2.1.2.4A – Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Event-Report	M	Handled, but data always ignored. Asynchronous input from the printer to this AE used to report changes in printer status. It may be received any time after association establishment, and before association release or abort.
N-Get	U	May be issued by this device at any time to get printer status. The Attribute Identifier List will always be empty, indicating that all attributes are to be returned.

Note: These attributes are not set by this device. The attribute description here indicates which attributes are used by this device when they are returned by the printer.

Table 2.1.2.1.2.4B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Printer Status	(2110,0010)	NORMAL, WARNING, FAILURE	Warning and Failure are reported to user.
Print Status Info	(2110,0020)		Reported to user.
Printer Name	(2110,0030)		Not used.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 15 of 47	

Table 2.1.2.1.2.4B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Manufacturer	(0008,0070)		Not used.
Model Name	(0008,1090)		Not used.
Serial Number	(0018,1000)		Not used.
Software Version	(0018,1020)		Not used.
Calibration Date	(0018,1200)		Not used.
Calibration Time	(0018,1201)		Not used.

2.2 Basic Color Print Management AE Specification

The Basic Color Print Management AE provides conformance to the following DICOM SOP classes as a SCU:

Table 2.2 – Basic Color Print Management AE Conformance

SOP Class Name	SOP Class UID	Conformance Level
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Standard
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Standard
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Standard
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Standard
Printer SOP Class	1.2.840.10008.5.1.1.16	Standard

2.2.1 Association Establishment Policies

The Basic Color Print Management AE will initiate an association when an entire film sheet has been captured and is ready to print; or when a previously captured film sheet is re-queued for printing.

2.2.1.1 General

Maximum PDU size offered: 32,768 bytes
Maximum PDU size accepted: 65,536 bytes.

2.2.1.2 Number of Associations

The number of simultaneous associations for the Basic Color Print Management AE is one.

Note: The other AE's in this device may be simultaneously active, and thus other associations may be open simultaneously.

2.2.1.3 Asynchronous Nature

The Basic Color Print Management AE will not use asynchronous operations window negotiation.

2.2.1.4 Implementation Identifying Information

Implementation Class UID: "1.2.840.113742.2.20100825"
Implementation Version name: "PACSGEAR V4.30"

Note: "113742" is registered by PACSGEAR, Inc. with ANSI. The class UID and version name above are subject to change in subsequent versions.

2.2.2 Association Initiation by Real-World Activity

The Basic Color Print Management AE will open associations to the Color Print SCP when a film sheet is ready to be printed.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 16 of 47	

2.2.2.1 Association Initiation by Queued Film Sheet

The following will cause an association request to be sent to the Color Print SCP:

- The capture of the last image on a film sheet,
- Pressing the End Sheet key with at least one image on a film sheet, or
- Re-queuing a previously captured film sheet.

2.2.2.1.1 Proposed Presentation Context to a Color Print Server

Table 2.2.2.1.1 – Printing AE Proposed Presentation Contexts to a Color Print Server.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.2.2.1.1.1 SOP Specific Conformance to Basic Color Print Management Meta SOP Class

The Basic Color Print Management AE provides standard conformance to the Basic Color Print Management Meta SOP Class as a SCU. This implies standard conformance for the:

- Basic Film Session SOP Class
- Basic Color Image Box SOP Class
- Basic Film Box SOP Class
- Printer SOP Class.

The conformance to the Basic Film Session SOP Class, Basic Film Box SOP Class, and Printer SOP Class are identical to their uses in the Basic Grayscale Print Management Class. The Basic Color Image Box SOP Class is described in the paragraphs to follow.

2.2.2.1.1.1.1 SOP Specific Conformance to Basic Color Image Box SOP Class

Table 2.2.2.1.1.1.1A – Supported DIMSE Services

NAME	USAGE	DESCRIPTION
N-Set	M	An image box instance is created by the SCP for each potential image of the film box. Note: Only the instances that will actually contain images will be updated with the N SET message.

Table 2.2.2.1.1.1.1B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
Image Position	(2020,0010)	1-n	Used.
Basic Color Image Sequence	(2020,0111)		Used.
>Samples/pixel	(0028,0002)	3	Used.
>Photometric Interpretation	(0028,0004)	RGB	Used.

Table 2.2.2.1.1.1B – Supported SOP Class Attributes

NAME	ATTRIBUTE TAG	RANGE	DESCRIPTION
>Planar Configuration	(0028,0006)	1	Planar. All red plane first: then green and blue.
>Rows	(0028,0010)		Image height in pixels.
>Columns	(0028,0011)		Image width in pixels.
>Pixel Aspect Ratio	(0028,0034)	1-32767\1-32767	Row value\Column value.
>Bits Allocated	(0028,0100)	8	8 bits per sample.
>Bits Stored	(0028,0101)	8	8 bits per sample.
>High bit	(0028,0102)	7	Bit 7 is MSB.
>Pixel Representation	(0028,0103)	0	Unsigned pixel values.
>Pixel Data	(7FE0,0010)		Color pixel data.
Polarity	(2020,0020)	NORMAL REVERSE	Not used. Specifies whether minimum pixel values are to be printed with unsaturated or saturated color.
Referenced Overlay Sequence	(2020,0130)		Not used.
>SOP Class UID	(0008,1150)		Not used.
>SOP Instance UID	(0008,1155)		Not used.
Magnification Type	(2010,0060)		Not used. (Set in Basic Film Box.)
Smoothing Type	(2010,0080)		Not used.
Requested Image Size	(2020,0030)		Not used.

2.3 MODALITY Worklist AE - Specification

The Modality Worklist AE provides conformance to the following DICOM SOP Class as a SCU:

Table 2.3 – Modality Worklist AE Conformance

SOP Class Name	SOP Class UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

2.3.1 Association Establishment Policies

The Modality Worklist AE will initiate an association with a Modality Worklist SCP in order to perform a worklist query.

2.3.1.1 General

Maximum PDU size offered: 32,768 bytes
Maximum PDU size accepted: 65,536 bytes.

2.3.1.2 Number of Associations

The number of simultaneous associations for the Modality Worklist AE is one.

Note: The other AE's in this device may be simultaneously active, and thus other associations may be open simultaneously.

2.3.1.3 Asynchronous Nature

The Modality Worklist AE will not use asynchronous operations window negotiation.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 18 of 47	

2.3.1.4 Implementation Identifying Information

Implementation Class UID: "1.2.840.113742.2.20100825"

Implementation Version name: "PACSGEAR V4.30"

Note: "113742" is registered by PACSGEAR, Inc. with ANSI. The class UID and version name above are subject to change in subsequent versions.

2.3.2 Association Initiation by Real World Activity

The Modality Worklist AE will establish an association with a Modality Worklist SCP with only one active query at a time. The association is closed at completion of the query.

2.3.2.1 Association Initiation by Opening New Exam/Worklist Search

The Modality Worklist AE will initiate an association with a Modality Worklist SCP as follows:

- By pressing the New/End Exam key when "Exam ID Config" has been set to "Find New Worklist", or
- By selecting the Worklist Search menu item.

2.3.2.1.1 Proposed Presentation Context to a Worklist SCP

Table 2.3.2.1.1 – Modality Worklist AE Proposed Context to Worklist SCP

ABSTRACT SYNTAX		TRANSFER SYNTAX		ROLE	EXTENDED NEGOTIATION
NAME	UID	NAME LIST	UID LIST		
Modality Worklist Information Model	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.3.2.1.2 Modality Worklist Information Attributes

Table 2.3.2.1.2 – Modality Worklist Information Model Attributes

Module	Attribute Name	Tag	Match Type	Return Type	Mapped to Image	Comments
Patient Identification	Patient Name	0010,0010	R	1	Yes	
Patient Identification	Patient ID	0010,0020	R	1	Yes	
Patient Demographic	Patient's Birth Date	0010,0030	O	2	Yes	
Patient Demographic	Patient's Sex	0010,0040	O	2	Yes	
Requested Procedure	Study Instance UID	0020,000D	O	1	Yes	
Requested Procedure	Requested Procedure Description	0032,1060	O	1C	No	
Scheduled Procedure Step	Scheduled Procedure Step Sequence	0040,0100	R	1		
Scheduled Procedure Step	>Scheduled Station AE Title	0040,0001	R	1	No	
Scheduled Procedure Step	>Scheduled Procedure Step Start Date	0040,0002	R	1	No	

Table 2.3.2.1.2 – Modality Worklist Information Model Attributes

Module	Attribute Name	Tag	Match Type	Return Type	Mapped to Image	Comments
Scheduled Procedure Step	>Scheduled Procedure Step Start Time	0040,0003	R	1	No	Keypad Display.
Scheduled Procedure Step	>Scheduled Performing Physician's Name	0040,0006	R	2	No	
Scheduled Procedure Step	>Scheduled Procedure Step Description	0040,0007	O	1C	Yes	Mapped to 0008,1030, "Study Description" - Keypad Display.
Scheduled Procedure Step	>Scheduled Station Name	0040,0010	O	2	No	
Scheduled Procedure Step	>Scheduled Procedure Step Location	0040,0011	O	2	No	
Scheduled Procedure Step	>Modality	0008,0060	R	1	No	
Imaging Service Request	Accession Number	0008,0050	O	2	Yes	Keypad Display.
Imaging Service Request	Referring Physician's Name	0008,0090	O	2	Yes	Keypad Display.

2.3.3 Modality Worklist AE Behaviors to SCP Status

Table 2.3.3 – Modality Worklist AE Behavior to Status Returned from SCP

Status Value	Meaning	Description	Storage AE Behavior
0000	Success	Normal return.	Upon completion of a successful association the new worklist will be visible on the keypad display. The operator may view the returned worklist elements via the Up and Down arrow keys on the keypad.
0xXXXX	Failure	Returned Failure Code	Visible to operator as "Unable to Open Worklist Server" displayed on keypad. Returned failure code (0xNNNN) visible with "Info" key on keypad.
Out of sockets	Failure	Acquisition Module out of sockets	Visible to operator as "Out of Sockets" displayed via "Info" key on keypad.
Unsupported class	Failure	SCP does not support either Verification or Storage Commitment SOP Class	Visible to operator as "Unsupported Class" displayed via "Info" key on keypad.
Connect failure	Failure	TCP/IP connect failure	Visible to operator as "Connect Failure" displayed via "Info" key on keypad.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 20 of 47	

2.4 Storage Class AE - Specification

The Storage Class AE provides conformance to the following DICOM SOP Classes as a SCU:

Table 2.4 – Storage Class AE Conformance

SOP Class Name	SOP Class UID	Conformance Level
Verification SOP Class	1.2.840.10008.1.1	Standard
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Standard Extended
Ultrasound Multi-frame Image Storage SOP Class (retired)	1.2.840.10008.5.1.4.1.1.3	Standard Extended
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Standard Extended
Nuclear Medicine Image Storage SOP Class (retired)	1.2.840.10008.5.1.4.1.1.5	Standard Extended
Ultrasound Image Storage SOP Class (retired)	1.2.840.10008.5.1.4.1.1.6	Standard Extended
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Standard Extended
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Standard Extended
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Standard
Multi-frame True Color SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4	Standard
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Standard Extended
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Standard Extended

Note: The AAM-CA also provides conformance to Verification SOP Class as a SCP.

2.4.1 Association Establishment Policies

The Storage AE will initiate an association when an image is queued for storage.

2.4.1.1 General

Maximum PDU size offered: 32,768 bytes
Maximum PDU size accepted: 65,536 bytes.

2.4.1.2 Number of Associations

The number of simultaneous associations for the Storage AE is one.

Note: The other AEs in this device may be simultaneously active, and thus other associations may be open simultaneously.

2.4.1.3 Asynchronous Nature

The Storage AE will not use asynchronous operations window negotiation.

2.4.1.4 Implementation Identifying Information

Implementation Class UID: "1.2.840.113742.2.20100825"
Implementation Version name: "PACSGEAR V4.30"

Note: "113742" is registered by PACSGEAR, Inc. with ANSI. The class UID and version name above are subject to change in subsequent versions.

2.4.2 Association Initiation by Real-World Activity

The Storage AE will open an association to the Storage Class SCP when an image is queued for storage.

2.4.2.1 Association Initiation by Queued Image

The capture of images destined for the Archive Server, or requeuing a previously captured exam will cause an association request to be sent to the Storage Class SCP.

2.4.2.1.1 Proposed Presentation Context to an Archive Server

Table 2.4.2.1.1 – Storage AE Proposed Presentation Contexts to a Storage Class SCP

Presentation Context Table					
ABSTRACT SYNTAX		TRANSFER SYNTAX		ROLE	EXTENDED NEGOTIATION
NAME	UID	NAME LIST	UID LIST		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU or SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Ultrasound Multi-frame Image Storage SOP Class (Retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		JPEG Lossy Compression Process 1 (8-bit)	1.2.840.10008.1.2.4.50		
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		JPEG Lossy Compression Process 1 (8-bit)	1.2.840.10008.1.2.4.50		

Table 2.4.2.1.1 – Storage AE Proposed Presentation Contexts to a Storage Class SCP

Presentation Context Table					
ABSTRACT SYNTAX		TRANSFER SYNTAX		ROLE	EXTENDED NEGOTIATION
NAME	UID	NAME LIST	UID LIST		
Nuclear Medicine Image Storage SOP Class (Retired)	1.2.840.10008.5.1.4.1.1.5	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		JPEG Lossy Compression Process 1 (8-bit)	1.2.840.10008.1.2.4.50		
Ultrasound Image Storage SOP Class (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.21840.10008.5.1.4.1.1.7.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		JPEG Lossy Compression Process 1 (8-bit)	1.2.840.10008.1.2.4.50		

Table 2.4.2.1.1 – Storage AE Proposed Presentation Contexts to a Storage Class SCP

Presentation Context Table					
ABSTRACT SYNTAX		TRANSFER SYNTAX		ROLE	EXTENDED NEGOTIATION
NAME	UID	NAME LIST	UID LIST		
Multi-frame True Color SC Image Storage SOP Class	1.21840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		JPEG Lossy Compression Process 1 (8-bit)	1.2.840.10008.1.2.4.50		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		JPEG Lossy Compression Process 1 (8-bit)	1.2.840.10008.1.2.4.50		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		JPEG Lossy Compression Process 1 (8-bit)	1.2.840.10008.1.2.4.50		

2.4.2.1.1.1 SOP Specific Conformance to Verification SOP Class

The Storage AE provides standard conformance to the Verification SOP Class as a Service Class User, as well as a Service Class Provider.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 24 of 47	

2.4.2.1.1.2 SOP Specific Conformance to Computed Radiography Image Storage SOP Class

The Computed Radiography Image Storage SOP uses the CR Image IOD's Modules as follows:

Table 2.4.2.1.1.2A – Computed Radiography Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used.
General Study	M	Used.
Patient Study	U	Not used.
General Series	M	Used.
CR Series	M	Used.
General Equipment	M	Used.
General Image	M	Used.
Image Pixel	M	Used.
Contrast/Bolus	C	Not used.
CR Image	M	Used.
Overlay Plane	U	Not used.
Curve	U	Not used.
Modality LUT	U	Not used.
VOI LUT	U	Not used.
SOP Common	M	Used.

Note: Each Module that is used by the storage AE has a table below, which indicates the elements supported.

Table 2.4.2.1.1.2B – Patient Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Patient's Name	0010,0010	2		Patient name with ^ delimiters.
Patient ID	0010,0020	2		64 char max.
Patient's Birth Date	0010,0030	2		Retrieved from worklist server; otherwise zero length.
Patient's Sex	0010,0040	2		Retrieved from worklist server; otherwise zero length.
Referenced Patient Sequence	0008,1120	3		Not used.
Patient's Birth Time	0010,0032	3		Not used.
Other Patient IDs	0010,1000	3		Not used.
Other Patient Names	0010,1001	3		Not used.
Ethnic Group	0010,2160	3		Not used.
Patient Comments	0010,4000	3		Not used.

Table 2.4.2.1.1.2C – General Study Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Study Instance UID	0020,000D	1		Used.
Study Date	0008,0020	2		Used: yyyyymmdd
Study Time	0008,0030	2		Used: hhmmss
Referring Physician's Name	0008,0090	2		Retrieved from worklist server; otherwise zero length.
Study ID	0020,0010	2		Code number of study.
Accession Number	0008,0050	2		Used.
Study Description	0008,1030	3		Retrieved from worklist server; otherwise zero length. (Mapped from 0040,0007 in worklist.)
Physician(s) of Record	0008,1048	3		Not used.
Name of Reading Physician(s)	0008,1060	3		Not used.
Referenced Study Sequence	0008,1110	3		Not used.

Table 2.4.2.1.1.2D – General Series Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Modality	0080,0060	1		Used.
Series Instance UID	0020,000E	1		Used.
Series Number	0020,0011	2		Used.
Laterality	0020,0060	2C		Not used.
Series Date	0008,0021	3		Used: yyyyymmdd
Series Time	0008,0031	3		Used: hhmmss
Performing Physician's Name	0008,1050	3		Not used.
Protocol Name	0018,1030	3		Not used.
Series Description	0008,103E	2C/2		Zero length.
Operator's Name	0008,1070	3		Not used.
Referenced Study Component Sequence	0008,1111	3		Not used.
Body Part Examined	0018,0015	3		Zero Length.
Patient Position	0018,5100	2C		Not used.
Smallest Pixel Value in Series	0028,0108	3		Not used.
Largest Pixel Value in Series	0028,0109	3		Not used.
Requested Attributes Sequence	0040,0275	3		Not used.
Performed Procedure Step ID	0040,00253	3		Not used.
Performed Procedure Step Start Date	0040,00244	3		Not used.
Performed Procedure Step Start Time	0040,00245	3		Not used.
Performed Procedure Step Description	0040,0254	3		Not used.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 26 of 47	

Table 2.4.2.1.1.2E – CR Series Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Body Part Examined	0018,0015	2		Zero length.
View Position	0018,5101	2		Zero length.
Filter Type	0018,1160	3		Not used.
Collimator/grid Name	0018,1180	3		Not used.
Focal Spot	0018,1190	3		Not used.
Plate Type	0018,1260	3		Not used.
Phosphor Type	0018,1261	3		Not used.

Table 2.4.2.1.1.2F – General Equipment Module Attribute

NAME	TAG	TYPE	RANGE	DESCRIPTION
Manufacturer	0008,0070	2		Used.
Institution Name	0008,0080	3		Used.
Institution Address	0008,0081	3		Not used.
Station Name	0008,1010	3		Used.
Institutional Department Name	0008,1040	3		Not used.
Manufacturer's Model Name	0008,1090	3		Used.
Device Serial Number	0018,1000	3		Not used.
Software Version	0018,1020	3		Used.
Spatial Resolution	0018,1050	3		Not used.
Date of Last Calibration	0018,1200	3		Not used.
Time of Last Calibration	0018,1201	3		Not used.
Pixel Padding Value	0028,0120	3		Not used.

Table 2.4.2.1.1.2G – General Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Image Number	0020,0013	2		Used.
Patient Orientation	0020,0020	2C		Zero length.
Content Date	0008,0023	2C		Used: yyyyymmdd
Content Time	0008,0033	2C		Used: hhmmss
Image Type	0008,0008	3		Not used.
Acquisition Number	0020,0012	3		Not used.
Acquisition Date	0008,0022	3		Not used.
Acquisition Time	0008,0032	3		Not used.
Referenced Image Sequence	0008,1140	3		Not used.
Derivation Description	0008,2111	3		Not used.
Source Image Sequence	0008,2112	3		Not used.
Images in Acquisition	0020,1002	3		Not used.
Image Comments	0020,4000	3		Used.
Lossy Image Compression	0028,2110	3	00 01	Used if multiframe. 00 if uncompressed; 01 if JPEG lossy compressed.

Table 2.4.2.1.1.2H – Image Pixel Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Samples Per Pixel	0028,0002	1	1/3	1 for monochrome; 3 for color
Photometric Interpretation	0028,0004	1	MONOCHROME2	For monochrome.
			RGB	For color.
			YBR_FULL_422	For compressed color.
Planar Configuration	0028,0006	1C	0 1	Used for color. 0 if multiframe; 1 if single frame.
Rows	0028,0010	1		Used.
Columns	0028,0011	1		Used.
Bits Allocated	0028,0100	1	8, 12	8 or 12 bits per sample.
Bits Stored	0028,0101	1	8, 12	8 or 12 bits per sample.
High Bit	0028,0102	1	7, 11	8 or 12 bits per sample.
Pixel Representation	0028,0103	1	0	For unsigned integers.
Pixel Data	7EF0,0010	1		Used.
Pixel Aspect Ratio	0028,0034	1C	1-32767\1-32767	Row value\column value.
Smallest Image Pixel Value	0028,0106	3		Not used.
Largest Image Pixel Value	0028,0107	3		Not used.
Red Palette Color Lookup Table Descriptor	0028,1101	1C		Not used.
Green Palette Color Lookup Table Descriptor	0028,1102	1C		Not used.
Blue Palette Color Lookup Table Descriptor	0028,1103	1C		Not used.
Red Palette Color Lookup Table Data	0028,1201	1C		Not used.
Green Palette Color Lookup Table Data	0028,1202	1C		Not used.
Blue Palette Color Lookup Table Data	0028,1203	1C		Not used.

Table 2.4.2.1.1.2J – CR Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
KVP	0018,0060	3		Not used.
Plate ID	0018,1004	3		Not used.
Distance Source to Detector	0018,1110	3		Not used.
Distance Source to Patient	0018,1111	3		Not used.
Exposure Time	0018,1150	3		Not used.
X-Ray Tube Current	0018,1151	3		Not used.
Exposure	0018,1152	3		Not used.
Exposure in μAs	0018,1153	3		Not used.
Image Pixel Spacing	0018,1164	3		Not used.
Generator Power	0018,1170	3		Not used.

Table 2.4.2.1.1.2J – CR Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Acquisition Device Processing Description	0018,1400	3		Not used.
Acquisition Device Processing Code	0018,1401	3		Not used.
Cassette Orientation	0018,1402	3		Not used.
Cassette Size	0018,1403	3		Not used.
Exposure on Plate	0018,1404	3		Not used.
Relative X-Ray Exposure	0018,1405	3		Not used.
Sensitivity	0018,6000	3		Not used.

Table 2.4.2.1.1.2K – SOP Common Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
SOP Class UID	0008,0016	1		Value for image storage SOP Class.
SOP Instance UID	0008,0018	1		Same as the Affected SOP Instance.
Specific Character Set	0008,0005	1C		Used if not default.
Instance Creation Date	0008,0012	3		Not used.
Instance Creation Time	0008,0013	3		Not used.
Instance Creator UID	0008,0014	3		Not used.

2.4.2.1.1.3 SOP Specific Conformance to Ultrasound Multi-Frame Image Storage SOP Class

The Ultrasound Multi-frame Image Storage SOP uses the Ultrasound Image IOD's Modules as follows:

Table 2.4.2.1.1.3A – Ultrasound Multi-frame Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
Frame of Reference	U	Not used.
US Frame of Reference	C	Not used.
General Equipment	M	Used. See 2.4.2.1.1.2.
General Image	M	Used. See 2.4.2.1.1.2.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Palette Color Lookup Table	C	Not used.
Contrast/Bolus	C	Not used.
Cine	M	Used.
Multi-frame	M	Used.
US Region Calibration	U	Not used.
US Image	M	Used.
VOI LUT	U	Not used.
Curve Identification	M	Not used since the Curve IE is mutually exclusive with the Image IE.
Curve	M	Not used since the Curve IE is mutually exclusive with the Image IE.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 29 of 47	

Table 2.4.2.1.1.3A – Ultrasound Multi-frame Image Storage Modules

MODULE	USAGE	DESCRIPTION
Audio	U	Not used since the Curve IE is mutually exclusive with the Image IE.
SOP Common	M	Used. See 2.4.2.1.1.2.

Each Module, which is used by the storage AE, has a table below that indicates the elements supported. (Modules described in previous sections will not be repeated.)

Table 2.4.2.1.1.3B – US Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Samples Per Pixel	0028,0002	1	1, 3	1 for monochrome; 3 for color.
Photometric Interpretation	0028,0004	1	MONOCHROME2	For monochrome.
			RGB	For color.
			YBR_FULL_422	For compressed color.
Planar Configuration	0028,0006	1C	0 1	Used for color. 0 if multiframe; 1 if single frame.
Bits Allocated	0028,0100	1	8	For 8 bits per sample.
Bits Stored	0028,0101	1	8	For 8 bits per sample.
High Bit	0028,0102	1	7	For 8 bits per sample.
Pixel Representation	0028,0103	1	0000	For unsigned integer.
Frame Increment Pointer	0028,0009	1C		Not used.
Lossy Image Compression	0028,2110	1C	00 01	Used if multiframe. 00 if uncompressed; 01 if JPEG lossy compressed.
Image Type	0008,0008	2		Zero length.
Number Stages	0008,2124	2C		Not used.
Number Views in Stage	0008,212A	2C		Not used.
Ultrasound Color Data Present	0028,0014	3		Not used.
Referenced Overlay Sequence	0008,1130	3		Not used.
Referenced Curve Sequence	0008,1145	3		Not used.
Stage Name	0008,2120	3		Not used.
Stage Number	0008,2122	3		Not used.
View Number	0008,2128	3		Not used.
Number of Event Timers	0008,2129	3		Not used.
Event Elapsed Time(s)	0008,2130	3		Not used.
Event Timer Name(s)	0008,2132	3		Not used.
Anatomic Region Sequence	0008,2218	3		Not used.
Primary Anatomic Structure Sequence	0008,2228	3		Not used.
Transducer Position Sequence	0008,2240	3		Not used.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 30 of 47	

Table 2.4.2.1.1.3B – US Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Transducer Orientation Sequence	0008,2224	3		Not used.
Trigger Time	0018,1060	3		Not used.
Nominal Interval	0018,1062	3		Not used.
Beat Rejection Flag	0018,1080	3		Not used.
Low R-R Value	0018,1081	3		Not used.
High R-R Value	0018,1082	3		Not used.
Heart Rate	0018,1088	3		Not used.
Output Power	0018,5000	3		Not used.
Transducer Data	0018,5010	3		Not used.
Transducer Type	0018,6031	3		Not used.
Focus Depth	0018,5012	3		Not used.
Preprocessing Function	0018,5020	3		Not used.
Mechanical Index	0018,5022	3		Not used.
Bone Thermal Index	0018,5024	3		Not used.
Cranial Thermal Index	0018,5026	3		Not used.
Soft Tissue Thermal Index	0018,5027	3		Not used.
Soft Tissue-focus Thermal Index	0018,5028	3		Not used.
Soft Tissue-surface Thermal Index	0018,5029	3		Not used.
Depth of Scan Field	0018,5050	3		Not used.
Image Transformation Matrix	0018,5210	3		Not used.
Image Translation Vector	0018,5212	3		Not used.
Overlay Subtype	60xx,0045	3		Not used.

Table 2.4.2.1.1.3C – Cine Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Preferred Playback Sequencing	0018,1244	3	0 1	Used. 0 for Looping; 1 for Sweeping.
Frame Time	0018,1063	1C		Used.
Frame Time Vector	0018,1065	1C		Not used.
Start Trim	0008,2142	3		Not used.
Stop Trim	0008,2143	3		Not used.
Recommended Display Frame Rate	0008,2144	3		Not used.
Cine Rate	0018,0040	3		Not used.
Frame Delay	0018,1066	3		Not used.
Image Trigger Delay	0018,1067	3		Not used.
Effective Duration	0018,0072	3		Not used.
Actual Frame Duration	0018,1242	3		Not used.

TITLE:

the DiCOM box™
DICOM Conformance Statement

NO.

001-00258-00

REV.

D

PAGE:

31 of 47

Table 2.4.2.1.1.3D – Multi-frame Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Number of Frames	0028,0008	1		Used.
Frame Increment Pointer	0028,0009	1		Used.

2.4.2.1.1.4 SOP Specific Conformance to Retired Ultrasound Multi-frame Image Storage SOP Class

The Retired Ultrasound Multi-frame Image Storage SOP uses the Ultrasound Image IOD's Modules as follows:

Table 2.4.2.1.1.4 – (Retired) Ultrasound Multi-frame Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
Frame of Reference	U	Not used.
US Frame of Reference	C	Not used.
General Equipment	M	Used. See 2.4.2.1.1.2.
General Image	M	Used. See 2.4.2.1.1.2.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Contrast/Bolus	C	Not used.
Cine	M	Used. See 2.4.2.1.1.3.
Multi-frame	M	Used. See 2.4.2.1.1.3.
US Region Calibration	U	Not used.
US Image	M	Used. See 2.4.2.1.1.3.
VOI LUT	U	Not used.
Curve Identification	M	Not used since the Curve IE is mutually exclusive with the Image IE.
Curve	M	Not used since the Curve IE is mutually exclusive with the Image IE.
Audio	U	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

2.4.2.1.1.5 SOP Specific Conformance to Retired Nuclear Medicine Image Storage SOP Class

The Retired Nuclear Medicine Image Storage SOP uses the CT Image IOD's Modules as follows:

Table 2.4.2.1.1.5A – Nuclear Medicine Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
NM Series	M	Used.
Frame of Reference	U	Not used.
General Equipment	M	Used. See 2.4.2.1.1.2.
NM Equipment	U	Not used.
General Image	M	Used. See 2.4.2.1.1.2.
Image Plane	U	Not used.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Multi-frame	C	Used. See 2.4.2.1.1.3.
NM Multi-frame	M	Used.
NM Image	M	Used.
NM SPECT Acq Image	C	Not used.
NM MUGA Image	C	Not used.
Overlay Plane	U	Not used.
Multi-frame Overlay	U	Not used.
Curve	U	Not used.
VOI LUT	U	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

Each Module, which is used by the storage AE, has a table below that indicates the elements supported. (Modules described in previous sections will not be repeated.)

Table 2.4.2.1.1.5B – NM Series Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Radionuclide	0018,0030	2		Zero length.
NM Series Type	0008,0042	2		Zero length.
Scan Velocity	0018,1300	2C		Not used.
Whole Body Technique	0018,1301	2C		Not used.
Scan Length	0018,1302	2C		Not used.
Radiopharmaceutical	0018,0031	3		Not used.
Energy Window Centerline	0018,0032	3		Not used.
Energy Window Total Width	0018,0033	3		Not used.
Intervention Drug Name	0018,0034	3		Not used.
Intervention Drug Start Time	0018,0035	3		Not used.
Effective Series Duration	0018,0072	3		Not used.
Syringe counts	0018,1045	3		Not used.

TITLE:

the DiCOM box™
DICOM Conformance Statement

NO.

001-00258-00

REV.

D

PAGE:

33 of **47****Table 2.4.2.1.1.5B – NM Series Module Attributes**

NAME	TAG	TYPE	RANGE	DESCRIPTION
Trigger Source or Type	0018,1061	3		Not used.
Radionuclide Route	0018,1070	3		Not used.
Radionuclide Volume	0018,1071	3		Not used.
Radionuclide Start Time	0018,1072	3		Not used.
Radionuclide Stop Time	0018,1073	3		Not used.
Radionuclide Total Dose	0018,1074	3		Not used.
Gantry/Detector Tilt	0018,1120	3		Not used.
Isotope Number	0020,0014	3		Not used.

Table 2.4.2.1.1.5C – NM Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Frame Increment Pointer	0028,0009	1C		Used if frame count >1.
Zoom Factor	0028,0031	2		Zero length.
Counts Accumulated	0018,0070	2		Zero length.
Referenced Overlay Sequence	0008,1130	3		Not used.
Referenced Curve Sequence	0008,1145	3		Not used.
Acquisition Termination Condition	0018,0071	3		Not used.
Reconstruction Diameter	0018,1100	3		Not used.
Distance Source to Detector	0018,1110	3		Not used.
Table Height	0018,1130	3		Not used.
Table Traverse	0018,1131	3		Not used.
Angular Position	0018,1141	3		Not used.
Radial Position	0018,1142	3		Not used.
Convolution Kernel	0018,1210	3		Not used.
Actual Frame Duration	0018,1242	3		Not used.
Count Rate	0018,1243	3		Not used.
Preprocessing Function	0018,5020	3		Not used.
Postprocessing Function	0018,5021	3		Not used.
Phase Number	0020,0015	3		Not used.
Interval Number	0020,0016	3		Not used.
Time Slot Number	0020,0017	3		Not used.
Angle Number	0020,0018	3		Not used.
Zoom Center	0028,0032	3		Not used.
Corrected Image	0028,0051	3		Not used.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 34 of 47	

2.4.2.1.1.6 SOP Specific Conformance to Ultrasound Image Storage SOP Class

The Ultrasound Image Storage SOP uses the Ultrasound Image IOD's Modules as follows:

Table 2.4.2.1.1.6 – Ultrasound Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
Frame of Reference	U	Not used.
US Frame of Reference	C	Not used.
General Equipment	M	Used. See 2.4.2.1.1.2.
General Image	M	Used. See 2.4.2.1.1.2.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Palette Color Lookup Table	C	Not used.
Contrast/Bolus	C	Not used.
US Region Calibration	U	Not used.
US Image	M	Used. See 2.4.2.1.1.3.
Overlay Plane	U	Not used.
VOI LUT	U	Not used.
Curve Identification	M	Not used since the Curve IE is mutually exclusive with the Image IE.
Curve	M	Not used since the Curve IE is mutually exclusive with the Image IE.
Audio	U	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

2.4.2.1.1.7 SOP Specific Conformance to Retired Ultrasound Image Storage SOP Class

The Retired Ultrasound Image Storage SOP uses the Ultrasound Image IOD's Modules as follows:

Table 2.4.2.1.1.7 – Ultrasound Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
Frame of Reference	U	Not used.
US Frame of Reference	C	Not used.
General Equipment	M	Used. See 2.4.2.1.1.2.
General Image	M	Used. See 2.4.2.1.1.2.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Contrast/Bolus	C	Not used.
US Region Calibration	U	Not used.
US Image	M	Used. See 2.4.2.1.1.3.

Table 2.4.2.1.1.7 – Ultrasound Image Storage Modules

MODULE	USAGE	DESCRIPTION
Overlay Plane	U	Not used.
VOI LUT	U	Not used.
Curve Identification	M	Not used since the Curve IE is mutually exclusive with the Image IE.
Curve	M	Not used since the Curve IE is mutually exclusive with the Image IE.
Audio	U	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

2.4.2.1.1.8 SOP Specific Conformance to Secondary Capture Image Storage SOP Class

The Secondary Capture Image Storage SOP uses the Secondary Capture Image IOD's Modules as follows:

Table 2.4.2.1.1.8A – Secondary Capture Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
General Equipment	U	Used. See 2.4.2.1.1.2.
SC Equipment	M	Used.
General Image	M	Used. See 2.4.2.1.1.2.
Image Pixel	M	Used. See 2.4.2.1.1.2.
SC Image	M	Used.
Overlay Plane	U	Not used.
Modality LUT	U	Not used.
VOI LUT	U	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

Each Module, which is used by the storage AE, has a table below that indicates the elements supported. (Modules described in previous sections will not be repeated.)

Table 2.4.2.1.1.8B – SC Image Equipment Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Conversion Type	0008,0064	1	DV, DI	Used.
Modality	0008,0060	3		Used.
Secondary Capture Device ID	0018,1010	3		Not used.
Secondary Capture Device Manufacturer	0018,1016	3		Used.
Secondary Capture Device Manufacturer's Model Name	0018,1018	3		Used.
Secondary Capture Device Software Version	0018,1019	3		Used.
Video Image Format Acquired	0018,1022	3		Not used.
Digital Image Format Acquired	0018,1023	3		Not used.

Table 2.4.2.1.1.8C – SC Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Date of Secondary Capture	0018,1012	3		Not used.
Time of Secondary Capture	0018,1014	3		Not used.

2.4.2.1.1.9 SOP Specific Conformance to X-ray Angiography Image Storage SOP Class

The X-Ray Angiography Image Storage SOP uses the X-Ray Angiography Image IOD's Modules as follows:

Table 2.4.2.1.1.9A – X-Ray Angiography Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
General Equipment	M	Used. See 2.4.2.1.1.2.
General Image	M	Used. See 2.4.2.1.1.2.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Contrast/Bolus	C	Not used.
Cine	C	Used if frame count >1. See 2.4.2.1.1.3.
Multi-frame	C	Used if frame count >1. See 2.4.2.1.1.3.
Frame Pointers	U	Not used.
Mask	C	Not used.
Display Shutter	U	Not used.
Device	U	Not used.
Therapy	U	Not used.
X-Ray Image	M	Used.
X-Ray Acquisition	M	Used.
X-Ray Collimator	U	Not used.
X-Ray Table	C	Not used.
XA Positioner	M	Used.
Overlay Plane	U	Not used.
Multi-frame Overlay	C	Not used.
Curve	U	Not used.
Modality LUT	U	Not used.
VOI LUT	U	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 37 of 47	

Each Module, which is used by the storage AE, has a table below that indicates the elements supported. (Modules described in previous sections will not be repeated.)

Table 2.4.2.1.1.9B – X-Ray Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Frame Increment Pointer	0028,0009	1C		Not used.
Lossy Image Compression	0028,2110	1C		Not used.
Image Type	0008,0008	1	ORIGINAL\ PRIMARY\ SINGLE PLANE	Used.
Pixel Intensity Relationship	0028,1040	1	DISP	Used.
Samples/Pixel	0028,0002	1	1	Used.
Photometric Interpretation	0028,0004	1	MONOCHROME2	Used.
Bits Allocated	0028,0100	1	8, 12	For 8 or 12 bits per sample.
Bits Stored	0028,0101	1	8, 12	For 8 or 12 bits per sample.
High Bit	0028,0102	1	7, 11	For 8 or 12 bits per sample.
Pixel Representation	0028,0103	1	0000	Used.
Scan Options	0018,0022	3		Not used.
Anatomic Region Sequence	0008,2218	3		Not used.
Primary Anatomic Structure Sequence	0008,2228	3		Not used.
R-Wave Pointer	0028,6040	3		Not used.
Reference Image Sequence	0008,1140	3		Not used.
Derivation Description	0008,2111	3		Not used.
Acquisition Device Processing Description	0018,1400	3		Not used.
Calibration Image	0050,0004	3		Not used.

Table 2.4.2.1.1.9C – X-Ray Acquisition Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
KVP	0018,0060	2		Zero length.
Radiation Setting	0018,1155	1	SC	Used.
Exposure Time	0018,1150	3		Not used.
X-Ray Tube Current	0018,1151	3		Not used.
Exposure	0018,1152	3		Not used.
Grid	0018,1166	3		Not used.
Average Pulse Width	0018,1154	3		Not used.
Radiation Mode	0018,115A	3		Not used.
Type of Filters	0018,1161	3		Not used.
Intensifier Size	0018,1162	3		Not used.
Field of View Shape	0018,1147	3		Not used.
Field of View Dimension(s)	0018,1149	3		Not used.
Imager Pixel Spacing	0018,1164	3		Not used.

Table 2.4.2.1.1.9C – X-Ray Acquisition Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Focal Spot	0018,1190	3		Not used.
Image Area Dose Product	0018,115E	3		Not used.

Table 2.4.2.1.1.9D – XA Positioner Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Distance Source to Detector	0018,1110	3		Not used.
Distance Source to Patient	0018,1111	3		Not used.
Estimated Radiographic Magnification Factor	0018,1114	3		Not used.
Positioner Motion	0018,1500	2C		Not used.
Positioner Primary Angle	0018,1510	2		Zero length.
Positioner Secondary Angle	0018,1511	2		Zero length.
Positioner Primary Angle Increment	0018,1521	2C		Not used.
Positioner Secondary Angle Increment	0018,1522	2C		Not used.
Detector Primary Angle	0018,1530	3		Not used.
Detector Secondary Angle	0018,1531	3		Not used.

2.4.2.1.1.10 SOP Specific Conformance to X-Ray Radiofluoroscopic Image Storage SOP Class

The X-Ray Radiofluoroscopic Image Storage SOP uses the X-Ray RF Image IOD's Modules as follows:

Table 2.4.2.1.1.10 – X-Ray Radiofluoroscopic Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
General Equipment	M	Used. See 2.4.2.1.1.2.
General Image	M	Used. See 2.4.2.1.1.2.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Contrast/Bolus	C	Not used.
Cine	C	Used if frame count >1. See 2.4.2.1.1.3.
Multi-frame	C	Used if frame count >1. See 2.4.2.1.1.3.
Frame Pointers	U	Not used.
Mask	C	Not used.
Display Shutter	U	Not used.
Device	U	Not used.
Therapy	U	Not used.
X-Ray Image	M	Used. See 2.4.2.1.1.7.
X-Ray Acquisition	M	Used. See 2.4.2.1.1.7.
X-Ray Collimator	U	Not used.
X-Ray Table	U	Not used.

Table 2.4.2.1.1.10 – X-Ray Radiofluoroscopic Image Storage Modules

MODULE	USAGE	DESCRIPTION
XRF Positioner	U	Not used.
XRF Tomo Acquisition	C	Not used.
Overlay Plane	U	Not used.
Multi-frame Overlay	C	Not used.
Curve	U	Not used.
Modality LUT	C	Not used.
VOI LUT	U	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

2.4.2.1.1.11 SOP Specific Conformance to Multi-frame Grayscale Byte SC Image Storage SOP Class

The Multi-frame Grayscale Byte SOP uses the Secondary Capture Image IOD's Modules as follows:

Table 2.4.2.1.1.11A – Multi-frame Grayscale Byte SC Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
General Equipment	U	Used. See 2.4.2.1.1.2.
SC Equipment	M	Used. See 2.4.2.1.1.6.
General Image	M	Used. See 2.4.2.1.1.2.
Cine	U	Not used.
Image Pixel	M	Used. See 2.4.2.1.1.2.
Multi-frame	M	Used.
Frame Pointers	U	Not used.
SC Multi-frame Image	M	Used.
SC Multi-frame Vector	C	Not used.
VOI LUT	C	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

Each Module, which is used by the storage AE, has a table below that indicates the elements supported. (Modules described in previous sections will not be repeated.)

Table 2.4.2.1.1.11B – Multi-frame Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Number of Frames	0028,0008	1		Used.
Frame Increment Pointer	0028,0009	1		Used.

Table 2.4.2.1.1.11C – SC Multi-frame Image Module Attributes

NAME	TAG	TYPE	RANGE	DESCRIPTION
Burned In annotation	0028,0301	1	YES, NO	Used.
Presentation LUT Shape	2050,0020	1C		Not used.
Illumination	2010,015E	1C		Not used.
Reflected Ambient Light	2010,0160	1C		Not used.
Rescale Intercept	0028,1052	1C		Not used.
Rescale Type	0028,1054	1C		Not used.
Frame Increment Pointer	0028,0009	1C		Used.

2.4.2.1.1.12 SOP Specific Conformance to Multi-frame True Color SC Image Storage SOP Class

The Multi-frame True Color SOP uses the Secondary Capture Image IOD's Modules as follows:

Table 2.4.2.1.1.12 – Multi-frame True Color SC Image Storage Modules

MODULE	USAGE	DESCRIPTION
Patient	M	Used. See 2.4.2.1.1.2.
General Study	M	Used. See 2.4.2.1.1.2.
Patient Study	U	Not used.
General Series	M	Used. See 2.4.2.1.1.2.
General Equipment	U	Used. See 2.4.2.1.1.2.
SC Equipment	M	Used. See 2.4.2.1.1.8.
General Image	M	Used; See 2.4.2.1.1.2.
Cine	U	Not used.
Image Pixel	M	Used See 2.4.2.1.1.2.
Multi-frame	M	Used. See 2.4.2.1.1.11.
Frame Pointers	U	Not used.
SC Multi-frame Image	M	Used. See 2.4.2.1.1.11.
SC Multi-frame Vector	C	Not used.
VOI LUT	C	Not used.
SOP Common	M	Used. See 2.4.2.1.1.2.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 41 of 47	

2.4.3 Storage AE Behaviors to SCP Status

Table 2.4.3 – Storage AE Behavior to Status Returned from SCP

STATUS VALUE	MEANING	DESCRIPTION	STORAGE AE BEHAVIOR
0000	Success	Normal return.	Upon successful data store to an archive server, the Storage AE will continue operation without user notification.
A7xx	Refused	Out of resources	Upon failure to store data to the archive server, the user will be notified.
A9xx	Error	Data set does not match SOP class	Same as A7xx.
Cxxx	Error	Cannot understand	Same as A7xx.
B000	Warning	Coercion of data elements	Ignored.
B007	Warning	Data set does not match SOP class	Same as A7xx.
B006	Warning	Elements discarded	Ignored.

2.5 Storage Commitment Service Class

The Storage Commitment Class AE provides conformance to the following DICOM SOP Classes as a Service Class User:

Table 2.5 – Storage Commitment Class AE Conformance

SOP CLASS NAME	SOP CLASS UID
Storage Commitment Push SOP Class	1.21840.10008.1.20.1

2.5.1 Association Establishment Policies

Upon the successful completion of storage of a series of images to the archive server, the Storage Commitment AE will open an association with the Storage Commitment SCP.

2.5.1.1 General

Maximum PDU size offered: 32,768 bytes
Maximum PDU size accepted: 65,536 bytes.

2.5.1.2 Number of Associations

The number of simultaneous associations for the Storage Commitment AE is one.

Note: The other AEs in this device may be simultaneously active, and thus other associations may be open simultaneously.

2.5.1.3 Asynchronous Nature

The Storage Commitment AE will not use asynchronous operations window negotiation.

2.5.1.4 Implementation Identifying Information

Implementation Class UID: "1.2.840.113742.2.20100825"
Implementation Version name: "PACSGEAR V4.30"

Note: "113742" is registered by PACSGEAR, Inc. with ANSI. The class UID and version name above are subject to change in subsequent versions.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 42 of 47	

2.5.2 Association Initiation by Real-World Activity

The Storage Commitment AE will open an association to the Storage Commitment SCP upon the following:

- Completion of acquisition of a series of images, and
- The successful transfer of those images to an Archive.

The association is closed upon receiving a commitment response from the Storage Commitment SCP. During the association, a "P" (pending) will be displayed in the Exam Manager menu of the handheld controller of the acquisition module.

At the termination of the association, either a "C" (committed) or an "F" (failure) will be indicated (dependent upon the Storage Commitment SCP response). All stored images in the series must be successfully committed in order for a "C" to be displayed.

2.5.2.1 Proposed Presentation Context to a Storage Commitment SCP

Table 2.5.2.1 – Proposed Presentation Context to Storage Commitment SCP

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Storage Commitment Push SOP Class	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Each Module, which is used by the Storage Commitment AE, has a table below that indicates the elements supported. (Modules described in previous sections will not be repeated.)

2.5.2.1.1 Storage Commitment Information Attributes

Table 2.5.2.1.1 – Storage Commitment Request Action Information SCU Attributes

MODULE	NAME	TAG	TYPE	DESCRIPTION
Storage Commitment Request	Transaction UID	0008,1195	1	Used.
Storage Commitment Request	Storage Media File-Set ID	0088,0130	3	Not used.
Storage Commitment Request	Storage Media File-Set UID	0088,0140	3	Not used.
Storage Commitment Request	Referenced SOP Sequence	0008,1199	1	Used.
Storage Commitment Request	>Referenced SOP Class UID	0008,1150	1	Used.
Storage Commitment Request	>Referenced SOP Instance UID	0008,1155	1	Used.
Storage Commitment Requests	Referenced Study Component Sequence	0008,1111	1C	Not used.

2.5.3 Storage Commitment AE Behaviors to SCP Status

Table 2.5.3 – Storage Commitment AE Behavior to Status Returned from SCP

STATUS VALUE	MEANING	DESCRIPTION	STORAGE AE BEHAVIOR
0000	Success	Normal return.	Upon a successful commitment response from the storage Commitment server, the Storage Commitment AE will continue operation. When the display is in "Exam Manager" mode, a "C" will be displayed adjacent to the exam ID on the keypad display.
0xXXXX	Failure	Returned Failure Code	Visible to operator as "Association Reflection" displayed with error code via "Info" key on keypad.
Out of sockets	Failure	Acquisition Module out of sockets	Visible to operator as "Out of Sockets" displayed via "Info" key on keypad.
Unsupported class	Failure	SCP does not support either Verification or Storage Commitment SOP Class	Visible to operator as "Unsupported Class" displayed via "Info" key on keypad.
Connect failure	Failure	TCP/IP connect failure	Visible to operator as "Connect Failure" displayed via "Info" key on keypad.

2.6 Modality Performed Procedure Step Service Class

The Modality Performed Procedure Step AE provides conformance to the following DICOM SOP Classes as a Service Class User:

Table 2.6 – Modality Performed Procedure Step AE Conformance

SOP CLASS NAME	SOP CLASS UID
Modality Performed Procedure Step SOP Class	1.21840.10008.3.1.2.3.3

2.6.1 Association Establishment Policies

The Modality Performed Procedure Step AE will open an association with the MPPS SCP when:

- The first acquired image is queued for storage, and
- The procedure is completed.

2.6.1.1 General

Maximum PDU size offered: 32,768 bytes

Maximum PDU size accepted: 65,536 bytes.

2.6.1.2 Number of Associations

The number of simultaneous associations for the Storage AE is one.

Note: The other AEs in this device may be simultaneously active, and thus other associations may be open simultaneously.

2.6.1.3 Asynchronous Nature

The Modality Performed Procedure Step AE will not use asynchronous operations window negotiation.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 44 of 47	

2.6.1.4 Implementation Identifying Information

Implementation Class UID: "1.2.840.113742.2.20100825"

Implementation Version name: "PACSGEAR V4.30"

Note: "113742" is registered by PACSGEAR, Inc. with ANSI. The class UID and version name above are subject to change in subsequent versions.

2.6.2 Association Initiation by Real-World Activity

The Modality Performed Procedure Step AE will open an association with the MPPS server when the first acquired image is queued for storage and will report that the procedure is "In Progress." The association will then be closed.

When the procedure is completed, either by remote host control or by the operator ending the exam via the keypad, a second association will be opened, and the MPPS AE will report "Completed" to the MPPS server.

2.6.2.1 Proposed Presentation Context to a Modality Performed Procedure Step SCP

Table 2.6.2.1 – Proposed Presentation Context to MPPS SCP

ABSTRACT SYNTAX		TRANSFER SYNTAX		ROLE	EXTENDED NEGOTIATION
NAME	UID	NAME LIST	UID LIST		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Modality PPS SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Each Module, which is used by the MPPS AE, has a table below that indicates the elements supported. (Modules described in previous sections will not be repeated.)

2.6.2.1.1 Modality Performed Procedure Step Information Attributes

Table 2.6.2.1.1 – MPPS Information Model Attributes

MODULE	NAME	TAG	TYPE	DESCRIPTION
Performed Procedure Step	Patient Name	0010,0010	2	Used.
Performed Procedure Step	Patient ID	0010,0020	2	Used.
Performed Procedure Step	Patient's Birth Date	0010,0030	2	Used. Retrieved from worklist server; otherwise zero length
Performed Procedure Step	Patient's Sex	0010,0040	2	Used. Retrieved from worklist server; otherwise zero length
Performed Procedure Step	Referenced Patient Sequence	0008,1120	2	Not used. Zero length
Performed Procedure Step	Scheduled Step Attribute Sequence	0040,0270	1	Used.

TITLE: the DiCOM box™ DICOM Conformance Statement	NO. 001-00258-00	REV. D
	PAGE: 45 of 47	

Table 2.6.2.1.1 – MPPS Information Model Attributes

MODULE	NAME	TAG	TYPE	DESCRIPTION
Performed Procedure Step	>Study Instance UID	0020,000D	1	Used.
Performed Procedure Step	Referenced Study Sequence	0008,1110	2	Used.
Performed Procedure Step	>Accession Number	0008,0050	2	Not used.
Performed Procedure Step	>Requested Procedure ID	0040,1001	2	Not used.
Performed Procedure Step	>Requested Procedure Description	0032,1060	2	Not used.
Performed Procedure Step	>Scheduled Procedure Step ID	0040,0009	2	Not used.
Performed Procedure Step	>Scheduled Procedure Step Description	0040,0007	2	Not used.
Performed Procedure Step	Scheduled Protocol Code Sequence	0040,0008	2	Not used.
Performed Procedure Step	Performed Station AE Title	0040,0241	1	Used.
Performed Procedure Step	Performed Station Name	0004,0242	2	Not used.
Performed Procedure Step	Performed Location	0004,0243	2	Not used.
Performed Procedure Step	Performed Procedure Step Start Date	0040,0244	1	Used.
Performed Procedure Step	Performed Procedure Step Start Time	0040,0245	1	Used.
Performed Procedure Step	Performed Procedure Step ID	0040,0253	1	Used.
Performed Procedure Step	Performed Procedure Step Description	0040,0254	2	Not used.
Performed Procedure Step	Performed Procedure Type Description	0040,0255	2	Not used.
Performed Procedure Step	Performed Procedure Step End Date	0040,0250	2	Used. Type 1 in Final State.
Performed Procedure Step	Performed Procedure Step End Time	0040,0251	2	Used. Type 1 in Final State.
Performed Procedure Step	Performed Procedure Step Status	0040,0252	1	Used. "IN PROGRESS" "COMPLETED"
Image Acquisition Results	Modality	0008,0060	1	Used.
Image Acquisition Results	Study ID	0020,0010	2	Not used.
Image Acquisition Results	Performed Action Item Sequence	0040,0260	2	Not used.
Image Acquisition Results	Performed Series Sequence	0040,0340	2	Used upon completion.
Image Acquisition Results	>Performing Physician's Name	0008,1050	2C	Not used.
Image Acquisition Results	>Operator's Name	0008,1070	2C	Not used.
Image Acquisition Results	>Protocol Name	0008,1030	1C	Used. "NONE."
Image Acquisition Results	>Series Instance UID	0020000E	1C	Used upon completion.
Image Acquisition Results	>Series Description	0008,103E	2C	Not used.
Image Acquisition Results	>Retrieve AE Title	0008,0054	2C	Not used.

Table 2.6.2.1.1 – MPPS Information Model Attributes

MODULE	NAME	TAG	TYPE	DESCRIPTION
Image Acquisition Results	Referenced Image Sequence	0008,1140	2C	Used upon completion.
Image Acquisition Results	>Referenced SOP Instance UID	0008,1155	1C	Used upon completion.
Image Acquisition Results	Referenced Standalone SOP Instance Sequence	0040,0220	2C	Used upon completion.
Image Acquisition Results	>Referenced SOP Class UID	0008,1150	1C	Used upon completion.

2.6.3 Modality Performed Procedure Step AE Behaviors to SCP Status

Table 2.6.3 – MPPS AE Behavior to Status Returned from SCP

STATUS VALUE	MEANING	DESCRIPTION	STORAGE AE BEHAVIOR
0000	Success	Normal return.	Upon a successful commitment response from the MPPS server, the MPPS AE will continue operation.
0xXXXX	Failure	Returned Failure Code	Visible to operator as "Association Refection" displayed with error code via "Info" key on keypad.
Out of sockets	Failure	Acquisition Module out of sockets	Visible to operator as "Out of Sockets" displayed via "Info" key on keypad.
Unsupported class	Failure	SCP does not support either Verification or Storage Commitment SOP Class	Visible to operator as "Unsupported Class" displayed via "Info" key on keypad.
Connect failure	Failure	TCP/IP connect failure	Visible to operator as "Connect Failure" displayed via "Info" key on keypad.

TITLE: <p style="text-align: center;">the DiCOM box™ DICOM Conformance Statement</p>	NO. 001-00258-00	REV. D
PAGE: 47 of 47		

3.0 COMMUNICATION PROFILES

3.1 TCP/IP Stack Supported

The TCP/IP protocol is used.

Port address used will be the constant, 104, the “well known” TCP/IP port for DICOM.

3.1.1 Physical Media Supported

Standard IEEE 802 (Ethernet) 10BaseT/100BaseT (twisted pair) is supported.

4.0 EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

4.1 Standard Extended/Specialized/Private SOPs

None.

4.2 Private Transfer Syntaxes

None.

5.0 CONFIGURATION

This device obtains configuration information at the time of installation to provide the following:

- Application Entity descriptions
- Device operational preferences.

5.1 Configurable Parameters

The following parameters are configurable:

- Application Entity titles
- IP Address, subnet mask, gateway address
- Port numbers.

6.0 SUPPORT OF EXTENDED CHARACTER SETS

The following extended character sets are supported:

ISO-IR 100 Latin Alphabet No. 1

ISO-IR 148 Latin Alphabet No. 5

Note: This requires an extended character set keypad or touchscreen and a selection in the user menu.