ACOM T.O.P. 3.0

DICOM Conformance Statement for DICOM Send

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1 Introduction

1.1 Purpose

This DICOM Conformance Statement (DCS) is written according to part PS 3.2 of [1].

The applications described in this conformance statement are the Siemens implementation of the Basic Cardiac X-Ray Application Profile [2] and the Dynamic Cardio Review Augmented Application Profile [3] within the ACOM T.O.P. product installed with software version 3.0 or later. The ACOM DICOM Send implementation acts as SCU for the Storage Service.

1.2 Definitions, Acronyms, and Abbreviations

ACOM	A cardiac review station developed and sold by Siemens Medical Systems in the following configurations: ACOM.M version 3.0 and ACOM.B version 3.0.
ACOM.M	An ACOM that supports FSR (CD disc read), FSC (CD disc create), and FSU (CD disc update).
ACOM.B	An ACOM that supports only FSR (CD disc read).
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
NEMA	National Electrical Manufacturers Association

1.3 References

[1] Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-12, 1999

[2] Basic Cardiac X-Ray Application Profile, Annex B, NEMA PS 3.11, 1998

1.4 Connectivity and Interoperability

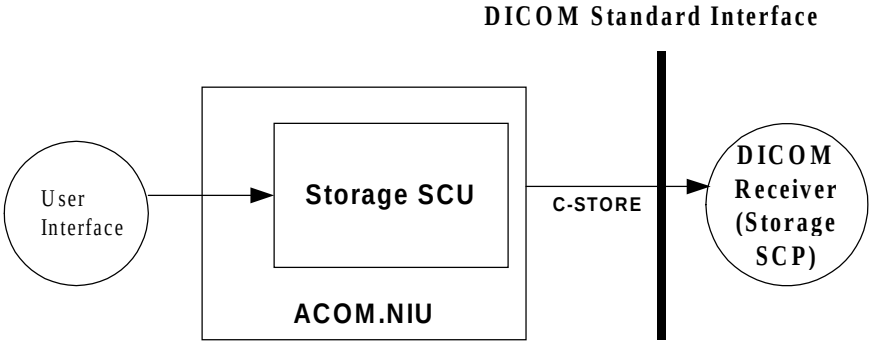
The implementation of the Siemens DICOM interface has been carefully tested to assure correspondence with this Conformance Statement. But the Conformance Statement and the DICOM standard do not guarantee interoperability of the Siemens modalities and modalities of other vendors. The user must compare the relevant Conformance Statements and if a successful interconnection should be possible, the user is responsible to specify an appropriate test suite and to validate the interoperability, which is required. A network environment may need additional functions out of the scope of DICOM.

2 Implementation Model

The ACOM.NIU provides transmission of the scene and reports over a DICOM network.

2.1 Application Data Flow Diagram

The ACOM.NIU will serve as an interface to the DICOM Receiver (SCP).



2.2 Functional Definition of Application Entities

The ACOM can perform the following function:

A scene can be transferred via C-STORE to a DICOM Storage Class Provider (SCP). The transfer can be initiated either manually by the user or configured to be automatic.

The data can be configured to be sent as either uncompressed or lossless compressed image. The configuration must match a type accepted by the receiver.

Only one destination can be configured at a time.

If ACOM.NIU receives any other SCP response status than “Success” or “Warning”, a failure message will be displayed on the ACOM.

2.3 Sequencing Requirements

Not applicable.

2.4 File Meta Information Options

The Implementation Class UID is: **1.3.12.2.1107.5.4.3.2**

The Source Application Entity Title of: "**SIEMENS:DCR 3.0**" is used. The "3.0" represents the current ACOM software phase (Siemens proprietary).

3 AE Specifications

3.1 Storage AE Specification

The ACOM DICOM Send provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU.

Table 3.1-1 Standard SOP Classes as an Storage SCU

SOP Class Name	SOP Class UID
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1

3.2 Association Establishment Policies

3.2.1 General

The configuration of the ACOM.NIU application defines the data compression, Application Entity Titles, the port numbers, and the host’s name. The ACOM application can be configured to automatically transfer data or manual transfers.

3.2.2 Number of Associations

The ACOM.NIU initiates one association at a time for each transfer request being processed.

3.2.3 Asynchronous Nature

The ACOM.NIU software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.3 Real World Activity: Storage SCU

The associated Real World activity is a C-STORE request initiated by the user or ACOM application. If the process successfully establishes an association to a remote Application Entity, it will transfer the selected images via the open association. If the C-STORE Response from the remote Application contains a status other than “Success” (return code 0000)or “Warning” (return code B000), the association is closed. The operation can be restarted at any time by user interaction.

3.4 Presentation Context Table

Presentation Context Table for Storage Service

Abstract Syntax		Transfer Syntax		Role
Name	UID	Name List	UID List	
X-Ray Angiographic	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Explicit VR Little Endian	1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.1	SCU

4 Augmented and Private Profiles

4.1 Augmented Profiles

None

4.1.1.3 Other Augmentations

None

4.2 Private Profiles

None

4.3.1 Supported Communication Stacks

The DICOM interface of the ACOM.NIU provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.3.2 TCP/IP Stack

The DICOM interface of the ACOM.NIU uses the TCP/IP stack from the Windows NT 4.0 operating system upon which it executes.

4.3.3 Physical Media Support

The DICOM interface of the ACOM.NIU is indifferent to the physical medium over which TCP/IP executes. It inherits this from the Windows operating system upon which it executes.

5 Extension, Specializations, Privatizations of SOP Classes and Transfer Syntaxes

None

6 Configuration

The following attributes are configurable in the System Configuration menu on the DICOM SCU Tab:

Transfer Syntax (Default: 1.2.840.10008.1.2.4.70)
Host Application Title for DICOM SCP (Default: AN_ACOMSERV)
Host Name for DICOM SCP (Default: AcomServ)
Host Port for DICOM SCP (Default: 104)
DICOM Client Name (Default: AN_ComputerName)

7 Character Sets

The ACOM DICOM Send supports the use of Latin 1 character set (Specific Character Set = “ISO_IR 100”).

Appendix: Supported Attributes

Note: <no data entered by ACOM> indicates data is always zero length.

A1.1 Image Data

Attribute Name	Tag	Value
Group Length	0002,0000	
File Meta Information Version	0002,0001	
Media Storage SOP Class UID	0002,0002	1.2.840.10008.5.1.4.1.1.12.1
Media Storage SOP Instance UID	0002,0003	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Transfer Syntax UID	0002,0010	Configurable: 1.2.840.10008.1.2.4.70 (JPEG Lossless compressed) or 1.2.840.10008.1.2. (Uncompressed pixel data, implicit value representation, little endian) or 1.2.840.10008.1.2.1 (Uncompressed pixel data, explicit value representation, little endian)
Implementation Class UID	0002,0012	1.3.12.2.1107.5.4.3.2
Source Application Entity Title	0002,0016	SIEMENS:DCR 3.0
Specific Character Set	0008,0005	ISO_IR 100
Image Type	0008,0008	ORIGINAL\PRIMARY\SINGLE PLANE or ORIGINAL\PRIMARY\SINGLE PLANE\SINGLE A or ORIGINAL\PRIMARY\SINGLE PLANE\SINGLE B or ORIGINAL\PRIMARY\BIPLANE A or ORIGINAL\PRIMARY\BIPLANE B
SOP Class UID	0008,0016	1.2.840.10008.5.1.4.1.1.12.1
SOP Instance UID	0008,0018	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Study Date	0008,0020	<yyyymmdd>
Image Date	0008,0023	<yyyymmdd>
Study Time	0008,0030	<hhmmss>
Image Time	0008,0033	<hhmmss>
Accession Number	0008,0050	
Modality	0008,0060	XA
Manufacturer	0008,0070	SIEMENS
Institution Name	0008,0080	<64 char max>
Institution Address	0008,0081	<no data entered by ACOM>
Referring Physician's Name	0008,0090	<no data entered by ACOM>
Study Description	0008,1030	<64 char max>
Performing Physician's Name	0008,1050	<64 char max "^" delimiter >

Note: The Value field in the above table is optional, as such, blank spaces are allowed.

Referenced Image Sequence	0008,1140	Sequence Items (if Image Type = BIPLANE A or BIPLANE B)
> Referenced SOP Class UID	0008,1150	1.2.840.10008.5.1.4.1.1.12.1 (X-Ray Angiographic Image Storage)
> Referenced SOP Instance UID	0008,1155	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Private Creator Data Element	0009,0010	CARDIO-SMS 1.0
Private Data 1	0009,1002	Private data stream
Private Data 2	0009,1003	Private data stream
Private Data 3	0009,100a	Private data stream
Private Data 4	0009,100b	Private data stream
Patient's Name	0010,0010	<64 char max, "^" delimiter>
Patient ID	0010,0020	<64 char max>
Patient's Birth Date	0010,0030	<yyyymmdd>
Patient's Sex	0010,0040	<"M", "F", or "O">
Patient's Size	0010,1020	
Patient's Weight	0010,1030	
KVP	0018,0060	<no data entered by ACOM>
Frame Time	0018,1063	(ms)
Exposure	0018,1152	<no data entered by ACOM> (mAs)
Radiation Setting	0018,1155	GR
Positioner Motion	0018,1500	<no data entered by ACOM>
Positioner Primary Angle	0018,1510	<depending upon HICOR configuration> (degrees)
Positioner Secondary Angle	0018,1511	<depending upon HICOR configuration> (degrees)
Private Creator Data Element	0019,0010	CARDIO-D.R. 1.0
Private Data	0019,1030	
Study Instance UID	0020,000D	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Series Instance UID	0020,000E	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Study ID	0020,0010	<16 char max>
Series Number	0020,0011	1
Image Number	0020,0013	<scene number>
Patient Orientation	0020,0020	<no data entered by ACOM>
Image Comments	0020,4000	<scene name>
Samples Per Pixel	0028,0002	1
Photometric Interpretation	0028,0004	MONOCHROME2
Number of Frames	0028,0008	<actual number of frames>
Frame Increment Pointer	0028,0009	00181063
Rows	0028,0010	512

Note: The Value field in the above table is optional, as such, blank spaces are allowed.

Columns	0028,0011	512
Bits Allocated	0028,0100	8
Bits Stored	0028,0101	8
High Bit	0028,0102	7
Pixel Representation	0028,0103	0
Pixel Intensity Relationship	0028,1040	LIN
Window Center	0028,1050	<if native image>
Window Width	0028,1051	<if native image>
Recommended Viewing Mode	0028,1090	SUB <if subtracted image>
Lossy Image Compression	0028,2110	00
Representative Frame Number	0028,6010	
R Wave Pointer	0028,6040	<when available>
Mask Subtraction Sequence	0028,6100	Sequence Items <if subtracted image>
> Mask Operation	0028,6101	AVG_SUB
> Mask Frame Numbers	0028,6110	1
Private Creator Data Element	0029,0010	CARDIO-D.R. 1.0
Private Data Stream	0029,1000	Sequence Items
> Private Data	0029,0010	CARDIO-D.R. 1.0
> Private Data	0029,1001	
> Private Data	0029,1002	
Calibration Image	0050,0004	<no data entered by ACOM>
Curve Dimensions [in Curve D]	5000,0005	2
Number of Points [in Curve Data]	5000,0010	
Type of [Curve] Data	5000,0020	ECG
Axis Units [of Curve D]	5000,0030	DPPS, NONE
[Curve] Data Value Representation	5000,0103	0
Minimum Coordinate Value	5000,0104	<no data entered by ACOM>
Maximum Coordinate Value	5000,0105	<no data entered by ACOM>
Curve Range	5000,0106	<no data entered by ACOM>
Curve Data Descriptor [Axis Specification]	5000,0110	0, 1
Coordinate Start Value [Starting Axis Value]	5000,0112	
Coordinate Step Value [Step Axis Value]	5000,0114	
Curve Data	5000,3000	
Pixel Data	7FE0,0010	Pixel Data Items

Note: The Value field in the above table is optional, as such, blank spaces are allowed.

A1.2 Report Files

Attribute Name	Tag	Value
Group Length	0002,0000	
File Meta Information Version	0002,0001	
Media Storage SOP Class UID	0002,0002	1.2.840.10008.5.1.4.1.1.12.1
Media Storage SOP Instance UID	0002,0003	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Transfer Syntax UID	0002,0010	Configurable: 1.2.840.10008.1.2.4.70 (JPEG Lossless compressed) or 1.2.840.10008.1.2. (Uncompressed pixel data, implicit value representation, little endian) or 1.2.840.10008.1.2.1 (Uncompressed pixel data, explicit value representation, little endian)
Implementation Class UID	0002,0012	1.3.12.2.1107.5.4.3.2
Source Application Entity Title	0002,0016	SIEMENS:DCR 3.0
Specific Character Set	0008,0005	ISO_IR 100
Image Type	0008,0008	ORIGINAL\PRIMARY\SINGLE PLANE or ORIGINAL\PRIMARY\SINGLE PLANE\SINGLE A or ORIGINAL\PRIMARY\SINGLE PLANE\SINGLE B or ORIGINAL\PRIMARY\BIPLANE A or ORIGINAL\PRIMARY\BIPLANE B
SOP Class UID	0008,0016	1.2.840.10008.5.1.4.1.1.12.1 (X-Ray Angiographic Image Storage)
SOP Instance UID	0008,0018	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Study Date	0008,0020	<yyyymmdd>
Image Date	0008,0023	<yyyymmdd>
Study Time	0008,0030	<hhmmss>
Image Time	0008,0033	<hhmmss>
Accession Number	0008,0050	
Modality	0008,0060	XA
Manufacturer	0008,0070	SIEMENS
Institution Name	0008,0080	<64 char max>
Institution Address	0008,0081	<no data entered by ACOM>
Referring Physician's Name	0008,0090	<no data entered by ACOM>
Study Description	0008,1030	<64 char max>
Performing Physician's Name	0008,1050	<64 char max "^" delimiter >
Private Creator Data Element	0009,0010	CARDIO-SMS 1.0
Private Data 1	0009,1002	Private data stream
Private Data 2	0009,1004	Private data stream

Note: The Value field in the above table is optional, as such, blank spaces are allowed.

Private Data 3	0009,1006	Private data stream
Private Data 4	0009,100a	Private data stream
Private Data 5	0009,100c	Private data stream
Patient's Name	0010,0010	<64 char max, "^" delimiter>
Patient ID	0010,0020	<64 char max>
Patient's Birth Date	0010,0030	<yyyymmdd>
Patient's Sex	0010,0040	<"M", "F", or "O">
Patient's Size	0010,1020	
Patient's Weight	0010,1030	
KVP	0018,0060	<no data entered by ACOM>
Exposure	0018,1152	<no data entered by ACOM> (mAs)
Radiation Setting	0018,1155	GR
Positioner Motion	0018,1500	<no data entered by ACOM>
Positioner Primary Angle	0018,1510	<depending upon HICOR configuration> (degrees)
Positioner Secondary Angle	0018,1511	<depending upon HICOR configuration> (degrees)
Study Instance UID	0020,000D	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Series Instance UID	0020,000E	1.3.12.2.1107.5.4.3.<system_id>.<yyyymmdd>.<hhmmss>.<N>
Study ID	0020,0010	<16 char max>
Series Number	0020,0011	1
Image Number	0020,0013	<report number>
Patient Orientation	0020,0020	<no data entered by ACOM>
Image Comments	0020,4000	<scene name>
Samples Per Pixel	0028,0002	1
Photometric Interpretation	0028,0004	MONOCHROME2
Number of Frames	0028,0008	<actual number of frames>
Rows	0028,0010	512
Columns	0028,0011	512
Bits Allocated	0028,0100	8
Bits Stored	0028,0101	8
High Bit	0028,0102	7
Pixel Representation	0028,0103	0
Pixel Intensity Relationship	0028,1040	LIN
Window Center	0028,1050	<default = 128 if subtracted, else calculated value>
Window Width	0028,1051	<default = 90 if subtracted, else calculated value>
Recommended Viewing Mode	0028,1090	NAT
Lossy Image Compression	0028,2110	00

Note: The Value field in the above table is optional, as such, blank spaces are allowed.

Representative Frame Number	0028,6010	1
Private Creator Data Element	0029,0010	CARDIO-SMS 1.0
Private Data	0029,1080	Sequence Items
> Private Creator Data Element	0029,0010	CARDIO-SMS 1.0
> Private Data	Multiple Tags	<Private Elements>
Calibration Image	0050,0004	<no data entered by ACOM>
Pixel Data	7FE0,0010	Pixel Data Items

Note: The Value field in the above table is optional, as such, blank spaces are allowed.