SIEMENS

FLUOROSPOT® H -GW VA10A update

[redacted] AX

DICOM Conformance Statement

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1. Introduction

1.1 Overview

The Conformance Statement describes the DICOM interface for the Siemens FLUOROSPOT® H - Gateway VA10A update in terms of part 2 of [DICOM].

This introduction describes the application's implemented DICOM functionality in general terms.

1.2 Scope and Field

The Siemens product FLUOROSPOT® H is a Multipurpose System for digital R/F Procedures. The FLUOROSPOT® H is designed to be integrated into an environment of medical DICOM-based devices. FLUOROSPOT® H supports the storage of images utilizing the DICOM SC IOD.

1.3 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

1.4 Remarks

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality as SCU and SCP, respectively.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Siemens and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM 3.0 Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

1. The comparison of different conformance statements is the first step towards assessing interconnectivity between Siemens and non-Siemens equipment.

2. Test procedures should be defined and tests should be performed by the user to validate the connectivity desired. DICOM itself and the conformance parts do not specify this.

3. The standard will evolve to meet the users' future requirements. Siemens is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

1.5 Definitions, Terms and Abbreviations

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

Additional Abbreviations are as follows

FSE Field Service Engineer
GW Gateway

1.6 References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.14, 1998

2 Image Storage

2.1 Implementation Model

2.1.1 Application Data Flow Diagram

Image Send is performed on the user's request for each study completed or for specific images selected. Upon request, an association will be initiated, selected images will be sent to the remote node and the association will be closed.

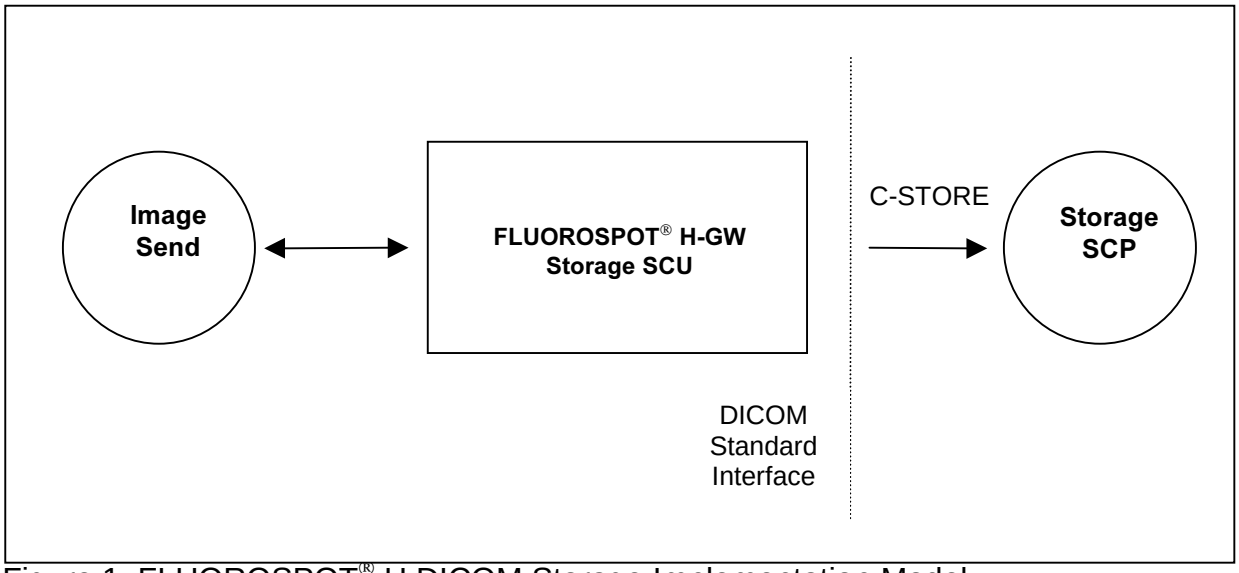

Figure 1: FLUOROSPOT® H DICOM Storage Implementation Model

2.1.2 Functional Definition "Image Send"

The FLUOROSPOT® H DICOM Application Entity acts as a Service Class User (SCU) for the

- Storage Service Class (to store images in a remote DICOM Node)

The Image Send Functionality is initiated through the user interface.

FLUOROSPOT® H will build a DICOM standard SC IOD and initiates sequential associations for each image to be sent.

If the association can not be opened, a notification to check for network problems will appear on the user interface. FLUOROSPOT® H will not retry to initiate the association automatically. Retries must be done by the user.

Foreground and background operations are possible also Image Send jobs could be queued.

2.1.3 Sequencing of Real-World Activities

not applicable

2.2 AE Specification

The FLUOROSPOT® H service class user application provides one AE being used when initiating associations to remote DICOM nodes.
SIEMENS Fluorospot H DICOM products provide Standard Conformance to the following DICOM SOP Classes as an SCU :

SOP Class Name	SOP Class UID
SC Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

2.2.1 Association Establishment Policies

2.2.1.1 General

The configuration of the Siemens Fluorospot H DICOM application defines the Application Entity Titles, the port numbers and of course the host name and net address.

Application Context Name (ACN)	1.2.840.10008.3.1.1.1
PDU maximum length	16 kB

2.2.1.2 Number of Associations

FLUOROSPOT® H will attempt to initiate one association at a time, one for each transfer request being processed.

2.2.1.3 Asynchronous Nature

Asynchronous communication, i.e. multiple outstanding transactions over a single association, is not supported.

2.2.1.4 Implementation Identifying Information

Implementation Class UID	“1.3.12.2.1107.5.3.2.41.10.41”
Implementation Version Name	“FLH_Gateway”

2.2.2 Association Initiation by Real-World Activity

FLUOROSPOT® H will attempt to initiate a new association for:

- DICOM Image Send (C-STORE)

2.2.2.1 Associated Real-World Activity

Image Send attempts to send an Image Object to a remote node. If the FLUOROSPOT® H AE establishes an association to a remote AE, it will transfer selected images via the open association. If the C-STORE response from the remote node contains a status other than “Success” or “Warning”) (warnings will be ignored) the association is aborted. Image Send can be restarted at any time by user interaction.

The DICOM target nodes will be configured by a FSE.

2.2.2.2 Proposed Presentation Context (Presentation Context Table)

The DICOM Interface of the FLUOROSPOT® H will propose the following presentation contexts:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
SC Image Storage Service Class	1.2.840.10008.5.1.4.1.1.7	DICOM Implicit VR Little Endian DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.2.2.3 SOP specific Conformance Statement

The DICOM images created by the DICOM interface of the FLUOROSPOT® H conform to the DICOM SC IOD .
Every image which will be sent, will get a new UID even it the same image has already been sent.

Please refer to Annex A for a complete listing of all supported DICOM elements.

2.2.3 Association Acceptance Policy

not applicable

2.3 Communication Profiles

2.3.1 Supported Communication Stacks (part 8)

The DICOM Interface of the FLUOROSPOT® H provides DICOM TCP/IP Network Communication Support.

2.3.2 TCP/IP Stack

The DICOM Interface of the FLUOROSPOT® H uses the TCP/IP stack from the SUN-OS system upon which executes. It uses the MergeCOM subroutine library that is based on a Berkeley socket interface.

2.3.3 Physical Media Support

The DICOM Interface of the FLUOROSPOT® H is indifferent to the physical medium over which TCP/IP executes; it inherits this from the SUN-OS system upon which it executes.

2.4 Extensions/Specializations/Privatizations

2.4.1 Standard Extended / Specialized / Private SOPs

None

2.4.2 Private Transfer Syntaxes

None

2.5 Configuration

2.5.1 AE Title/Presentation Address Mapping

The Siemens FLUOROSPOT® H-GW DICOM unique Application Entity Titles are assigned using the following mechanism:
Each Application Entity Title starts with a unique 10 character string assigned for this Siemens FLUOROSPOT® H-GW DICOM node. This string is also used as the first 10 characters of the PACSnet Logical Address (PLA) and builds the AEroot. An example for such a string is '049SA1DS39'.
The DICOM Sender Application provides the Application Entity Title:
<AEroot>DFOS

The Application Entity Title, Host name and Port numbers are configured using the SIEMENS FLUOROSPOT® H-GW configuration tool. This tool is intended to be used by a FSE only.

2.5.2 Configurable Parameters

The Application Entity Titles, Host names and Port numbers are configured using the Service tool.

Other configurable default values are described in 2.5.2.2 and 2.5.2.3.

2.5.2.1 Number of Simultaneous Associations

FLUOROSPOT® H supports for one service only one association at a time.

2.5.2.2 Maximum PDU Size

- max PDU size: 16 kB

2.5.2.3 Time Out

- time-out until a SCP has to accept/reject an association request : 60 sec
- time-out for responding to an association open/close request : 60 sec
- time-out for accepting a message over network : 60 sec

2.6 Support of Extended Character Sets

ISO-IR 100 (ISO 8859-1 Latin Alphabet N 1)

Annex A: Siemens DICOM IOD Description

Module	Attribute Name	TAG	Type	Comments
Patient	Patient's Name	0010,0010	2	"Last Name First Name"
	Patient ID	0010,0020	2	12 characters
	Patient's Birth Date	0010,0030	2	
	Patient's Sex	0010,0040	2	
General Study	Study Instance UID	0020,000D	1	generated by gateway
	Study Date	0008,0020	2	
	Study Time	0008,0030	2	
	Referring Physician's Name	0008,0090	2	No value, length = 0
	Study ID	0020,0010	2	Request ID in Study List
	Accession Number	0008,0050	2	
	Study Description	0008,1030	3	Comment text box in Study list
	Name of Physician(s) Reading Study	0008,1060	3	
General Series	Modality	0008,0060	1	"RF"
	Body Part Examined	0018,0015	3	
	Series Instance UID	0020,000E	1	generated by gateway
	Series Number	0020,0011	2	6 characters ["dddddd"] e.g. "000001"
General Equipment	Manufacturer	0008,0070	2	"SIEMENS "
	Institution Name	0008,0080	3	26 characters, Hospital Name
	Station Name	0008,1010	3	10 characters, PLA
	Manufacturer's Model Name	0008,1090	3	"FLUOROSPOT H"
	Institutional Department Name	0008,1040	3	26 characters, identical with 0008,0080
Image Equipment	Conversion Type	0008,0064	1	"DI"
General Image	Image Number	0020,0013	2	6 characters ["dddddd"]
	Patient Orientation	0020,0020	2C	No value, length 0
	Acquisition Date	0008,0022	2C	0008,0022=0008,0023
	Acquisition Time	0008,0032	2C	0008,0032=0008,0033
	Acquisition Number	0020,0012	3	6 characters ["dddddd"]
	Image Date	0008,0023	2C	
	Image Time	0008,0033	2C	
Image Pixel	Samples per Pixel	0028,0002	1	Always "1"
	Photometric Interpretation	0028,0004	1	MONOCHROME2
	Rows	0028,0010	1	1024
	Columns	0028,0011	1	1024
	Pixel Spacing	0028,0030	1	
	Bits Allocated	0028,0100	1	8
	Bits Stored	0028,0101	1	8
	High Bit	0028,0102	1	7
	Pixel Representation	0028,0103	1	0000H
	Rescale Type	0028,1054	1C	"US"
	Pixel Data	7FE0,0010	1	
Modality LUT Module	Rescale Intercept	0028,1052	1C	6 characters [" 0"]
	Rescale Slope	0028,1053	1C	2 characters ["01"]
VOILUT Module	Window Center	0028,1050	1C	12 characters ["0dddd\0dddd"]
	Window Width	0028,1051	1C	10 characters ["dddd\dddd"]
SOP Common	Secific Character Set	0008,0005	1C	"ISO_IR100"
	SOP Class UID	0008,0016	1	26 characters "1.2.840.10008.5.1.4.1.1.7"
	SOP Instance UID	0008,0018	1	generated by gateway

Table A.1: Elements included in SC IOD

Supported Retired Elements		
Attribute Name	**TAG**	**Type**
Data Set Type	0008,0040	RET
Comments	0008,4000	RET
Image Dimensions	0028,0005	RET

Table A.2: Other included elements