Philips Medical Systems
DICOM Conformance Statement

Gyroscan Panorama 1

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PHILIPS

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1 Introduction

This section provides general information about the scope, intended audience and contents of this Conformance Statement and how to use it.

1.1 Scope and field of application

The scope of this DICOM Conformance Statement is to facilitate data exchange between equipment of Philips Medical Systems and with equipment of other vendors. This document specifies the compliance to the DICOM standard, formally called the NEMA PS 3.X-1999 standards. It contains a short description of the applications involved and provides technical information about the data exchange capabilities of the equipment. The main elements describing these capabilities are: the supported DICOM Service Object Pair (SOP) Classes, Roles, Information Object Definitions (IOD), Service Elements and Transfer Syntaxes.

The field of application is the integration of the Philips Medical Systems equipment into an environment of medical devices.
This Conformance Statement should be read in conjunction with the DICOM standard and its addenda.

1.2 Intended audience

This Conformance Statement is intended for:
- (potential) clients,
- marketing staff interested in data exchange functionality,
- system integrators and Customer Support Engineers of medical equipment,
- software engineers implementing DICOM interfaces.

It is assumed that the reader is familiar with the DICOM standard.

1.3 Contents and structure

The DICOM Conformance Statement is contained in section 2 through 7 and follows the contents and structuring requirements of DICOM PS 3.2-1999.

1.4 Used definitions, terms and abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3-1999.
The word Philips in this document refers to Philips Medical Systems.

1.5 References

[DICOM] The Digital Imaging and Communications in Medicine (DICOM) standard:
NEMA PS 3.X (X refers to the part 1 - 13)
National Electrical Manufacturers Association (NEMA) Publication Sales
1300 N. 17th Street, Suite 1847
Rosslyn, Va. 22209, United States of America

[INTURIS] Philips Inturis Program
Integrated Clinical Solutions
Philips Medical Systems Nederland B.V. (see address at page ii)

1.6 Important note to the reader

This Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**
  Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a networked environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability. It is the user's responsibility to analyse thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**
  Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.
  The user should ensure that any non-Philips provider linking to Philips equipment, also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

1.7 General Acronyms and Abbreviations.

The following acronyms and abbreviations are used in the document.

- AE Application Entity
- ANSI American National Standard Institute
- DICOM Digital Imaging and Communication in Medicine
- DIMSE DICOM Message Service Element
- GUI Graphic User Interface
- ILE Implicit VR Little Endian
- IOD Information Object Definition
- NEMA National Electrical Manufacturers Association
- PDU Protocol Data Unit
- RIS Radiology Information System
- SCP Service Class Provider
- SCU Service Class User
- SOP Service Object Pair
- TCP/IP Transmission Control Protocol/Internet protocol
- UID Unique Identifier
- WLM Worklist Management

2 Implementation model

The Gyroscan Panorama system of Philips Medical Systems is an MR image generating system. The system contains:

- a DICOM Worklist Management to obtain a DICOM Worklist.
- a DICOM Image Export function to transfer DICOM MR images and image related data from Gyroscan Panorama to a remote system,
- a DICOM Print function to print images.
- a DICOM verification function.

2.1 Application Data Flow Diagram

Gyroscan Panorama behaves as a system with 4 Application Entities (AE). The related Implementation Model is shown in Figure 2-1 on page 4.

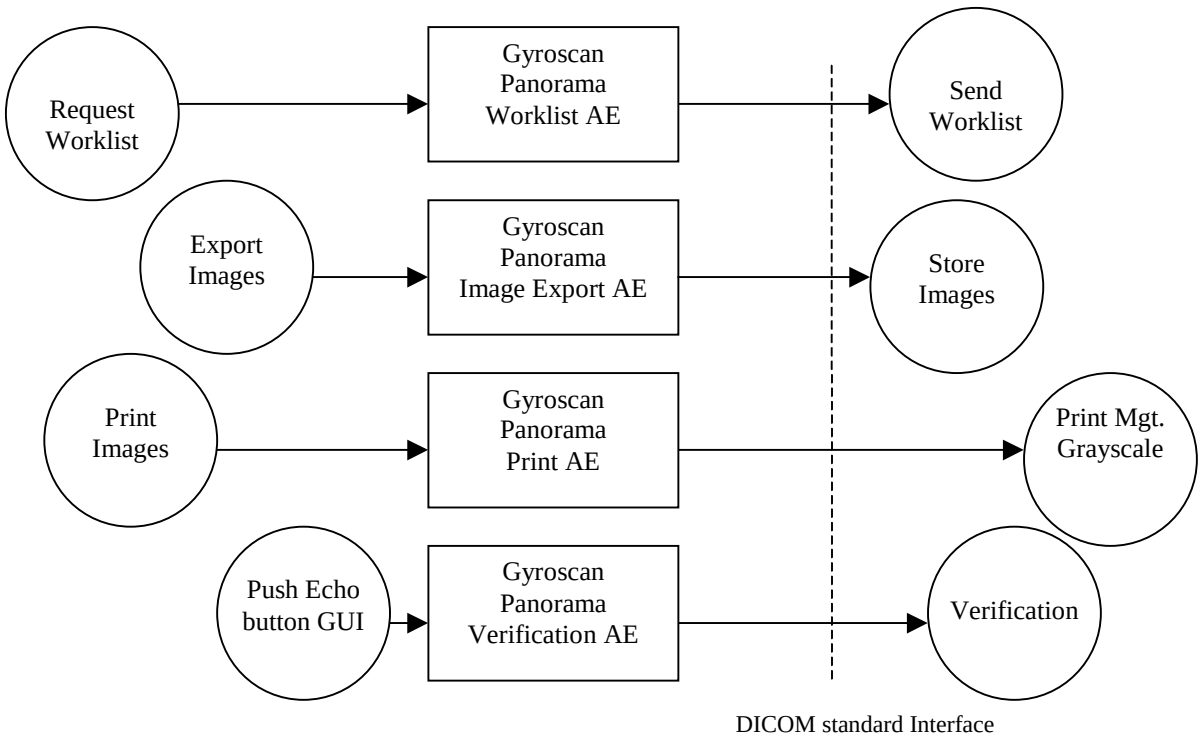

Figure 2-1: Implementation Model

The Gyroscan Panorama DICOM Modality Worklist function requests the worklist from a DICOM Information System like a RIS.

The Gyroscan Panorama DICOM Image Export function can be activated by the Gyroscan operator. The images to be sent are selected from one or more examinations. At export request the images will be converted into DICOM format and sent out to a remote destination. This destination is previously selected by the operator from the user interface.

The print implementation provides for transfer of images using the DICOM Basic Grayscale Print Management Meta SOP Class as a Service Class User (SCU). Transfers to DICOM network printers are initiated by an operator selecting the expose function.

With the Verification AE a DICOM connection can be evaluated.

2.2 Functional definition of application Entities

The Worklist AE acts as a Service Class User (SCU) of the Basic Worklist Management Service Class. It will subsequently request the Worklist data from the configured RIS

The Export AE establishes an association with the remote Storage SCP, sends all images in the series, then terminates the association. If the export function detects an error while sending an image, the export function will notify the operator and request operator intervention.

The Print AE runs as a server process which accepts requests initiated by a Film Control dialog. Each time the operator presses the Expose button, the film is printed. For each film, Print SCU establishes an association with the remote Print SCP, sends a film, then terminates the association. The process is repeated as necessary to print all of the films. If the Print SCU detects an error while sending a film, the Print SCU will report the error in Queue dialog and an operator intervention is required to reprint the film.

The Verification AE is a diagnostic tool which must be manually invoked. Each time the operator invokes DICOM Echo command, an association with the specified Verification SCP is established, diagnostic messages are displayed and the association is terminated.

2.3 Sequences of Real World Activities

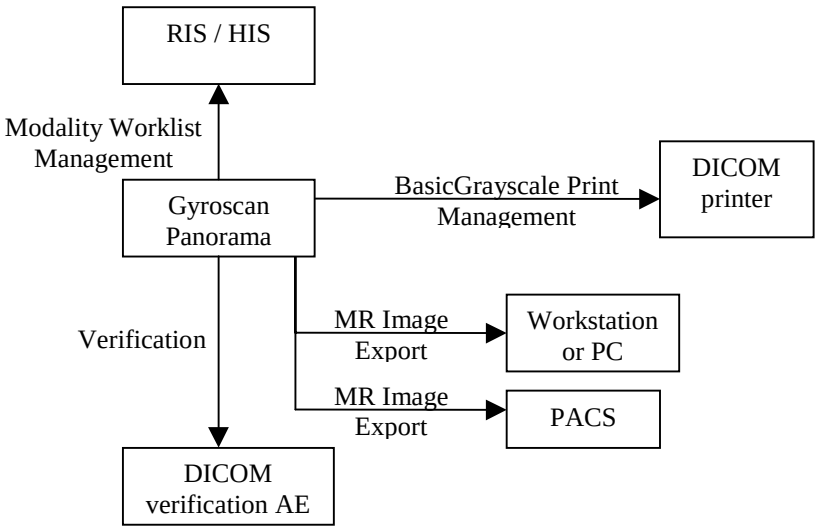

Figure 2-2: The Gyroscan Panorama system in a DICOM network

When a RIS interface is configured, the worklist data can be requested from the RIS. After import of the data, the user can add missing data.

Now the examination scan(s) are performed. After reconstruction the resulting images can be exported via DICOM.

The images can also be sent to a DICOM network printer.

3 AE Specifications

3.1 Gyroscan Panorama DICOM Worklist AE Specification

The Gyroscan Panorama provides conformance to the following DICOM 3.0 SOP class as an SCU:

Table 3-1: Supported SOP Classes as SCU

SOP Class Name	*UID*	*DIMSE*
Modality Worklist Information Model	1.2.840.10008.5.1.4.31	C-FIND

3.1.1 Association Establishment Policies

3.1.1.1 General

The default PDU size is 4 Kbytes, but it can be changed in DICOM configuration.

3.1.1.2 Number of Associations

The Worklist AE will attempt to establish one association at the time.

3.1.1.3 Asynchronous Nature

The Worklist AE does not support asynchronous operations and will not perform asynchronous window negotiation.

3.1.1.4 Implementation Identifying Information

The Implementation Class UID is: “2.16.840.1.113662.4.10.1“.

3.1.2 Association Initiation Policy

The following real world activities initiate associations:

- The Worklist AE initiates an association once each time a query request is done.

3.1.2.1 The Gyroscan Panorama DICOM Worklist Request

3.1.2.1.1 Associated Real-World Activity

An operator requests a Modality Worklist by pressing the Worklist button.

3.1.2.1.2 Proposed Presentation Contexts

The Worklist AE will propose the following presentation contexts:

Table 3-2: Proposed Presentation Contexts for the Gyroscan Panorama Worklist

Presentation Context table					
Abstract Syntax		*Transfer Syntax*		*Role*	*Extended Negotiation*
Name	*UID*	*Name List*	*UID List*		
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	ILE	1.2.840.10008.1.2	SCU	None

3.1.2.1.3 SOP Specific Conformance to Worklist SOP Classes

Worklist Query is requested using the Modality Worklist Information Model - Find SOP Class.

Table 3-3: Status

Service Status	*Codes*	*Further Meaning*
Refused	A700	Out of Resources, no information is given to the user trough the user interface.
Failed	A900	Identifier Does Not Match SOP Class, no information is given to the user trough the user interface.
	Cxxx	Unable to process, no information is given to the user trough the user interface.
Cancel	FE00	Matching terminated due to Cancel request
Success	0000	Matching is complete - No final Identifier is supplied.

3.1.2.1.3.1 Overview of the applied Worklist SOP Class C-FIND

This chapter specifies in detail the applied attributes in the C-FIND Service Element of this supported SOP Class.

Note:
* Attribute that can be used as a matching key.

Table 3-4: Modality Worklist Information Model - FIND SOP Class - Patient Identification Module

Attribute Name	*Tag*	*Note*
Patient's Name *	0010,0010	Wild Card Matching (* and ?), Universal Matching and Single Value Matching.
Patient ID *	0010,0020	Universal Matching and Single Value Matching.
Issuer of Patient ID	0010,0021	
Other Patient IDs	0010,1000	
Other Patient Names	0010,1001	
Patient's Birth Name	0010,1005	
Patient's Mother's Birth Name	0010,1060	
Medical Record Locator	0010,1090	

Table 3-5: Modality Worklist Information Model - FIND SOP Class - Patient Demographic Module

Attribute Name	*Tag*	*Note*
Patient's Birth Date	0010,0030	
Patient's Birth Time	0010,0032	
Patient's Sex	0010,0040	
Patient's Insurance Plan Code Sequence	0010,0050	
> Code Value	0008,0100	
> Coding Scheme Designator	0008,0102	
> Code Meaning	0008,0104	
Patient's Age	0010,1010	
Patient's Size	0010,1020	
Patient's Weight	0010,1030	
Patient's Address	0010,1040	
Military Rank	0010,1080	
Branch of Service	0010,1081	
Country of Residence	0010,2150	
Region of Residence	0010,2152	
Patient's Telephone Numbers	0010,2154	
Ethnic Group	0010,2160	
Occupation	0010,2180	

Table 3-5: Modality Worklist Information Model - FIND SOP Class - Patient Demographic Module

Attribute Name	*Tag*	*Note*
Patient's Religious Preference	0010,21F0	
Patient Comments	0010,4000	
Patient Data Confidentiality Constraint Description	0040,3001	

Table 3-6: Modality Worklist Information Model - FIND SOP Class - Patient Relationship Module

Attribute Name	*Tag*	*Note*
Referenced Visit Sequence	0008,1125	
> Referenced SOP Class UID	0008,1150	
> Referenced SOP Instance UID	0008,1155	
Referenced Patient Alias Sequence	0038,0004	
> Referenced SOP Class UID	0008,1150	
> Referenced SOP Instance UID	0008,1155	

Table 3-7: Modality Worklist Information Model - FIND SOP Class - Patient Medical Module

Attribute Name	*Tag*	*Note*
Medical Alerts	0010,2000	
Contrast Allergies	0010,2110	
Smoking Status	0010,21A0	
Additional Patient History	0010,21B0	
Pregnancy Status	0010,21C0	
Last Menstrual Date	0010,21D0	
Special Needs	0038,0050	
Patient State	0038,0500	

Table 3-8: Modality Worklist Information Model - FIND SOP Class - Visit Relationship Module

Attribute Name	*Tag*	*Note*
Referenced Patient Sequence	0008,1120	
> Referenced SOP Class UID	0008,1150	
> Referenced SOP Instance UID	0008,1155	

Table 3-9: Modality Worklist Information Model - FIND SOP Class - Visit Identification Module

Attribute Name	*Tag*	*Note*
Institution Name	0008,0080	
Institution Address	0008,0081	
Institution Code Sequence	0008,0082	
> Code Value	0008,0100	
> Coding Scheme Designator	0008,0102	
> Code Meaning	0008,0104	
Admission ID	0038,0010	
Issuer of Admission ID	0038,0011	

Table 3-10: Modality Worklist Information Model - FIND SOP Class - Visit Status Module

Attribute Name	*Tag*	*Note*
Visit Status ID	0038,0008	
Current Patient Location	0038,0300	
Patient’s Institution Residence	0038,0400	
Visit Comments	0038,4000	

Table 3-11: Modality Worklist Information Model - FIND SOP Class - Visit Admission Module

Attribute Name	*Tag*	*Note*
Referring Physician’s Name	0008,0090	
Referring Physician’s Address	0008,0092	
Referring Physician’s Telephone Numbers	0008,0094	
Admitting Diagnoses Description	0008,1080	
Admitting Diagnosis Code Sequence	0008,1084	
> Code Value	0008,0100	
> Coding Scheme Designator	0008,0102	
> Code Meaning	0008,0104	
Route of Admissions	0038,0016	
Admitting Date	0038,0020	
Admitting Time	0038,0021	

Table 3-12: Modality Worklist Information Model - FIND SOP Class - Scheduled Procedure Step Module

Attribute Name	*Tag*	*Note*
Scheduled Procedure Step Sequence	0040,0100	
> Modality	0008,0060	
> Requested Contrast Agent	0032,1070	
> Scheduled Station AE Title *	0040,0001	Fixed Value, that can be configured.
> Scheduled Procedure Step Start Date *	0040,0002	Range Matching
> Scheduled Procedure Step Start Time	0040,0003	
> Scheduled Procedure Step End Date	0040,0004	
> Scheduled Procedure Step End Time	0040,0005	
> Scheduled Performing Physician's Name	0040,0006	
> Scheduled Procedure Step Description	0040,0007	
> Scheduled Action Item Code Sequence	0040,0008	
>> Code Value	0008,0100	
>> Coding Scheme Designator	0008,0102	
>> Code Meaning	0008,0104	
> Scheduled Procedure Step ID	0040,0009	
> Scheduled Station Name	0040,0010	
> Scheduled Procedure Step Location	0040,0011	
> Pre-Medication	0040,0012	
> Scheduled Procedure Step Status	0040,0020	
> Comments on the Scheduled Procedure Step	0040,0400	

Table 3-13: Modality Worklist Information Model - FIND SOP Class - Requested Procedure Module

Attribute Name	*Tag*	*Note*
Referenced Study Sequence	0008,1110	
> Referenced SOP Class UID	0008,1150	
> Referenced SOP Instance UID	0008,1155	
Study Instance UID	0020,000D	
Requested Procedure Description	0032,1060	
Requested Procedure Code Sequence	0032,1064	
> Code Value	0008,0100	
> Coding Scheme Designator	0008,0102	
> Code Meaning	0008,0104	
Requested Procedure ID	0040,1001	
Requested Procedure Priority	0040,1003	

Table 3-14: Modality Worklist Information Model - FIND SOP Class - Imaging Service Request Module

Attribute Name	*Tag*	*Note*
Accession Number	0008,0050	
Requesting Physician	0032,1032	

3.1.3 Association Acceptance Policy

The DICOM Worklist AE does not accept associations

3.2 The Gyroscan Panorama DICOM Export AE Specification

The Gyroscan Panorama provides conformance to the following DICOM 3.0 SOP class as an SCU:

Table 3-15: Supported SOP Classes as SCU

SOP Class Name	*UID*	*DIMSE*
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	C-STORE

3.2.1 Association Establishment Policies

3.2.1.1 General

The default PDU size is 4 Kbytes, but it can be changed in DICOM configuration.

3.2.1.2 Number of Associations

The DICOM Export AE establishes a new association for each series of images transferred, and terminates the association after each series transfer is completed.

3.2.1.3 Asynchronous Nature

The Export AE does not support asynchronous operations and will not perform asynchronous window negotiation.

3.2.1.4 Implementation Identifying Information

The Implementation Class UID is: “2.16.840.1.113662.4.10.1“.

3.2.2 Association Initiation Policy

The following real world activities initiate associations:

- The Storage SCU initiates an association for each series queued for transfer.

3.2.2.1 The Gyroscan Panorama DICOM Export Request

3.2.2.1.1 Associated Real-World Activity

The Export AE transmits images via the DICOM MR Image Storage Service Class using the Presentation Contexts defined in the Table shown in Table 3-2, to all of the selected storage target device(s).

3.2.2.1.2 Proposed Presentation Contexts

The Export AE will propose the following presentation context:

Table 3-16: Proposed Presentation Contexts for the Gyroscan Panorama Storage

Presentation Context table					
Abstract Syntax		*Transfer Syntax*		*Role*	*Extended Negotiation*
Name	*UID*	*Name List*	*UID List*		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	ILE	1.2.840.10008.1.2	SCU	None

3.2.2.1.3 SOP Specific Conformance to Storage SOP Classes

PlanScans exported with the same Study Instance UID and Series UID can have different values for Study ID and Series Number. This inconsistency can result in a wrong data management on the SPC side.

An overview of the returned status is given in the table below.

Table 3-17: C-STORE STATUS

Service Status	*Codes*	*Further Meaning StatuS*
Refused	A7xx	Out of Resources. Association is released, no information is given to the user trough the user interface.
Error	A9xx	Data Set does not match SOP Class. Association is released, no information is given to the user trough the user interface.
	Cxxx	Cannot understand. Association is released, no information is given to the user trough the user interface.
Warning	B000	Coercion of Data Elements. Association is released.
	B007	Data Set does not match SOP Class. Association is released.
	B006	Elements Discarded. Association is released.
Success	0000	

Each of the configured Export Sections using DICOM can contain user defined fixed DICOM elements, which will be added into the DICOM stream when transferring images. Deleting DICOM elements from the stream is also possible.

Table 3-17 lists the applied optional and extended modules and attributes of the MR IOD.

Table 3-18: Applied optional Modules and Attributes of the applied MR IOD as standard configuration

IE	*Module*	*Used Conditional Attributes*	*Used Optional Attributes*
Patient	Patient	-	Patient Comments, Patient Birth Date
Study	General Study	-	Name of Physician(s) Reading Study, Study Description
	Patient Study	-	Patient Weight
Series	General Series	-	Series Date, Series Time, Performing Physician's Name, Operator's Name, Body Part Examined, Protocol Name
Frame of Reference	Frame of Reference	-	-
Equipment	General Equipment	-	Station Name, Institution Name, Manufacture's Model Name, Software Versions, Device Serial Number,
Image	General Image		Images in Acquisition, Image Comments
	Image Plane	-	Slice Location
	Image Pixel	-	-
	Contrast bolus	-	-
	MR Image	-	Sequence Name, Number of Averages, Receiving Coil, Percent Phase Field of View, Flip Angle
	VOI LUT	Window Width	Window Center
	SOP Common	-	-

3.2.2.1.3.1 Overview of the applied MR Image SOP Class C-Store

The modules selected from the MR Image IOD module table of DICOM 3.0 and the extended modules are given in the table below.

Table 3-19: Applied Modules in the Extended MR IOD

IE	*Module*	*Reference*
Patient	Patient	Table 3-20
Study	General Study	Table 3-21
	Patient Study	Table 3-22
Series	General Series	Table 3-23
Frame of reference	Frame of reference	Table 3-24
Equipment	General Equipment	Table 3-25
Image	General Image	Table 3-26
	Image Plane	Table 3-27
	Image Pixel	Table 3-28
	Contrast bolus	Table 3-29
	MR Image	Table 3-30
	VOI LUT	Table 3-31
	SOP Common	Table 3-32

The details of these applied modules are given in the tables below. The list of possible attribute values are given (if applicable). The situation that an attribute is present conditionally/optionally or that an attribute may contain a zero length value, is indicated too.

Table 3-20: MR Image Storage SOP Class - Patient Module

Attribute Name	*Tag*	*Note*
Patient's Name	0010,0010	
Patient ID	0010,0020	
Patient's Birth Date	0010,0030	
Patient's Sex	0010,0040	
Patient Comments	0010,4000	

Table 3-21: MR Image Storage SOP Class - General Study Module

Attribute Name	*Tag*	*Note*
Study Date	0008,0020	
Study Time	0008,0030	
Accession Number	0008,0050	
Referring Physician's Name	0008,0090	
Study description	0008,1030	
Name of Physician(s) Reading Study	0008,1060	
Study Instance UID	0020,000D	
Study ID	0020,0010	

Table 3-22: MR Image Storage SOP Class - Patient Study Module

Attribute Name	*Tag*	*Note*
Patient's Weight	0010,1030	

Table 3-23: MR Image Storage SOP Class - General Series Module

Attribute Name	*Tag*	*Note*
Series Date	0008,0021	
Series Time	0008,0031	
Modality	0008,0060	
Performing Physician's Name	0008,1050	
Operator's name	0008,1070	
Body Part Examined	0018,0015	
Protocol Name	0018,1030	
Series Instance UID	0020,000E	
Series Number	0020,0011	

Table 3-24: MR Image Storage SOP Class - Frame of Reference Module

Attribute Name	*Tag*	*Note*
Frame of Reference UID	0020,0052	
Position Reference Indicator	0020,1040	

Table 3-25: MR Image Storage SOP Class - General Equipment Module

Attribute Name	*Tag*	*Note*
Manufacturer	0008,0070	
Institution Name	0008,0080	
Station Name	0008,1010	
Manufacturer's Model Name	0008,1090	
Device Serial Number	0018,1000	
Software Versions	0018,1020	

Table 3-26: MR Image Storage SOP Class - General Image Module

Attribute Name	*Tag*	*Note*
Instance Number	0020,0013	
Images in Acquisition	0020,1002	
Image Comments	0020,4000	
Referenced Image Sequence	0008,1140	
>Referenced SOP Class UID	0008,1150	
>Referenced SOP Instance UID	0008,1155	

Table 3-27: MR Image Storage SOP Class - Image Plane Module

Attribute Name	*Tag*	*Note*
Slice Thickness	0018,0050	
Image Position (Patient)	0020,0032	
Image Orientation (Patient)	0020,0037	
Slice Location	0020,1041	
Pixel Spacing	0028,0030	

Table 3-28: MR Image Storage SOP Class - Image Pixel Module

Attribute Name	*Tag*	*Note*
Rows	0028,0010	
Columns	0028,0011	
Bits Stored	0028,0101	
High Bit	0028,0102	
Pixel Representation	0028,0103	
Pixel Data	7FE0,0010	

Table 3-29: MR Image Storage SOP Class - Contrast/Bolus Module

Attribute Name	*Tag*	*Note*
Contrast/Bolus Agent	0018,0010	

Table 3-30: MR Image Storage SOP Class - MR Image Module

Attribute Name	*Tag*	*Note*
Image Type	0008,0008	
Scanning Sequence	0018,0020	
Sequence Variant	0018,0021	
Scan Options	0018,0022	
MR Acquisition Type	0018,0023	
Sequence Name	0018,0024	

Table 3-30: MR Image Storage SOP Class - MR Image Module (Continued)

Attribute Name	*Tag*	*Note*
Echo Time	0018,0081	
Number of Averages	0018,0083	
Echo Train Length	0018,0091	
Percent Phase Field of View	0018,0094	
Receiving Coil	0018,1250	
Flip Angle	0018,1314	
Samples per Pixel	0028,0002	Applied value(s):1
Photometric Interpretation	0028,0004	Applied value(s): MONOCHROME1, MONOCHROME2
Bits Allocated	0028,0100	Applied value(s): 16

Table 3-31: MR Image Storage SOP Class - VOI LUT Module

Attribute Name	*Tag*	*Note*
Window Center	0028,1050	
Window Width	0028,1051	

Table 3-32: MR Image Storage SOP Class -SOP Common Module

Attribute Name	*Tag*	*Note*
Specific Character Set	0008,0005	Applied value(s): ISO_IR 100
SOP Class UID	0008,0016	Applied value(s): 1.2.840.10008.5.1.4.1.1.4
SOP Instance UID	0008,0018	

3.2.3 Association Acceptance Policy

The DICOM Export AE does not accept associations.

3.3 Gyroscan Panorama DICOM Print AE Specification

The Gyroscan Panorama provides Conformance to the following DICOM 3.0 SOP class as an SCU:

Table 3-33: Supported SOP Classes as SCU

SOP Class Name	*UID*	*DIMSE*
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	
> Printer SOP Class	1.2.840.10008.5.1.1.16	N-EVENT-REPORT N-GET
> Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	N-CREATE
> Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	N-CREATE N-ACTION
> Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	N-SET

3.3.1 Association Establishment Policies

3.3.1.1 General

The default PDU size is 4 Kbytes, but it can be changed in DICOM configuration.

3.3.1.2 Number of Associations

The Print AE will establish one association at a time.

3.3.1.3 Asynchronous Nature

The Print AE does not support asynchronous operations and will not perform asynchronous window negotiation.

3.3.1.4 Implementation Identifying Information

The Implementation Class UID is: “2.16.840.1.113662.4.10.1“.

3.3.2 Association Initiation Policy

The following real world activities initiate associations:

- The Print AE initiates an association each time film is printed.

3.3.2.1 The Gyroscan Panorama DICOM Print Request

3.3.2.1.1 Associated Real-World Activity

An operator open the Hardcopy control-dialog, moves images to the positions and clicks the Print button.

3.3.2.1.2 Proposed Presentation Contexts

The Print AE will propose the following presentation context:

Table 3-34: Proposed Presentation Contexts for the Gyroscan Panorama print

Presentation Context table					
Abstract Syntax		*Transfer Syntax*		*Role*	*Extended Negotiation*
Name	*UID*	*Name List*	*UID List*		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	ILE	1.2.840.10008.1.2	SCU	None

3.3.2.1.3 SOP Specific Conformance to Print SOP Classes

Image are printed using the Basic Grayscale Management Meta SOP Class.

On receiving an N_EVENT_REPORT FAILURE the Printjob is stopped, the association is released.

On receiving the following warning codes (N_ACTION) the Printjob is stopped:
- B602,B603 (No Image Box Instance)
- 0119 (Class Instance Conflict)

The Status of the Printer is requested after at performed Printjob (N-GET) and is displayed in the UI of the Gyroscan Panorama.

The attributes selected from the several print IOD module table of DICOM 3.0 are given in the tables below. The list of possible attribute values are given (if applicable). The situation that an attribute is present conditionally/optionally or that an attribute may contain a zero length value, is indicated too.

3.3.2.1.3.1 Overview of the applied Printer SOP Class N-GET

Table 3-35: Printer SOP Class - Printer Module

Attribute Name	*Tag*	*Note*
Manufacturer	0008,0070	
Manufacturer's Model Name	0008,1090	
Device Serial Number	0018,1000	
Software Version(s)	0018,1020	
Date of Last Calibration	0018,1200	
Time of Last Calibration	0018,1201	
Printer Status	2110,0010	
Printer Status Info	2110,0020	
Printer Name	2110,0030	

3.3.2.1.3.2 Overview of the applied Printer SOP Class N-EVENT-REPORT

Table 3-36: Printer SOP Class - Printer Module

Attribute Name	*Tag*	*Note*
Printer Status Info	2110,0020	
Printer Name	2110,0030	

3.3.2.1.3.3 Overview of the applied Basic Film Box SOP Class N-CREATE

Table 3-37: Basic Film Box SOP Class - Basic Film Box Presentation Module

Attribute Name	*Tag*	*Note*
Image Display Format	2010,0010	
Film Orientation	2010,0040	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Film Size ID	2010,0050	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Magnification Type	2010,0060	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Smoothing Type	2010,0080	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Border Density	2010,0100	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Empty Image Density	2010,0110	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Min Density	2010,0120	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Max Density	2010,0130	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Trim	2010,0140	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Configuration Information	2010,0150	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.

Table 3-38: Basic Film Box SOP Class - Basic Film Box Relationship Module

Attribute Name	*Tag*	*Note*
Referenced Film Session Sequence	2010,0500	
> Referenced SOP Class UID	0008,1150	
> Referenced SOP Instance UID	0008,1155	

3.3.2.1.3.4 Overview of the applied Basic Film Session SOP Class N-CREATE

Table 3-39: Basic Film Session SOP Class - Basic Film Session Presentation Module

Attribute Name	*Tag*	*Note*
Number of Copies	2000,0010	
Medium Type	2000,0030	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Film Destination	2000,0040	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.

3.3.2.1.3.5 Overview of the applied Basic Grayscale Image Box SOP Class N-SET

Table 3-40: Basic Grayscale Image Box SOP Class - Image Box Pixel Presentation Module

Attribute Name	*Tag*	*Note*
Magnification Type	2010,0060	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Smoothing Type	2010,0080	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Image Position	2020,0010	
Polarity	2020,0020	Can be configured, when not configured this attribute is not send. Applied Value can be configured for each SCP.
Preformatted Grayscale Image Sequence	2020,0110	
> Samples per Pixel	0028,0002	
> Photometric Interpretation	0028,0004	
> Rows	0028,0010	
> Columns	0028,0011	
> Pixel Aspect Ratio	0028,0034	
> Bits Allocated	0028,0100	
> Bits Stored	0028,0101	
> High Bit	0028,0102	
> Pixel Representation	0028,0103	
> Pixel Data	7FE0,0010	

3.3.3 Association Acceptance Policy

The DICOM Print AE does not accept associations

3.4 Gyroscan Panorama DICOM Verification AE Specification

The Verification AE provides Conformance to the following DICOM 3.0 SOP class as an SCU:

Table 3-41: Supported SOP Classes as SCU

SOP Class Name	*UID*	*DIMSE*
Verification SOP Class	1.2.840.10008.1.1	C-ECHO

3.4.1 Association Establishment Policies

3.4.1.1 General

The default PDU size is 4 Kbytes, but it can be changed in DICOM configuration.

3.4.1.2 Number of Associations

The Verification AE will attempt to astablish one association each time it is invoked.

3.4.1.3 Asynchronous Nature

The Verification AE does not support asynchronous operations and will not perform asynchronous window negotiation.

3.4.1.4 Implementation Identifying Information

The Implementation Class UID is: “2.16.840.1.113662.4.10.1“.

3.4.2 Association Initiation Policy

The following real world activities initiate associations:

- The Verification SCU initiates an association once each time it is invoked.

3.4.2.1 The Gyroscan Panorama DICOM Verification Request

3.4.2.1.1 Associated Real-World Activity

In the Gyroscan Panorama GUI an association can be made to verify application level communication using the C-ECHO command.

3.4.2.1.2 Proposed Presentation Contexts

The Verification AE will propose the following presentation context:

Table 3-42: Proposed Presentation Context for Gyroscan Panorama Verification

Presentation Context table					
Abstract Syntax		*Transfer Syntax*		*Role*	*Extended Negotiation*
Name	*UID*	*Name List*	*UID List*		
Verification	1.2.840.10008.1.1	ILE	1.2.840.10008.1.2	SCU	None

3.4.2.1.2.1 SOP Specific Conformance to Verification

The Verification AE provides standard conformance.

3.4.3 Association Acceptance Policy

The Verification AE does not accept associations.

4 Communication Profiles

4.1 Supported Communication Stacks

The Gyroscan Panorama provides DICOM 3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM 3.0 Standard. No OSI stack communications are provided with this implementation.

4.1.1 Physical Media Support

The Gyroscan Panorama system supports Ethernet v2.0 and IEEE 802.3, 10/100 BASE-T.

5 Extensions/Specializations/Privatizations

Gyroscan Panorama conforms to the Basic Print, MR Storage, Verification SOP Classes as Standard SOP Classes (i.e. no private attributes are defined).

6 Configuration

DICOM applications, and other networking applications must be configured by a Field Service Engineer.

Configurable Items:
- PDU Size
- Worklist query: "Scheduled Station AE Title".

7 Support of Extended Character Sets

The Gyroscan Panorama system supports Extended Character Set “ISO_IR 100” which is the Latin alphabet NO1, supplementary set.