

**Philips Medical Systems  
DICOM Conformance Statement**

**EasyWeb 2.0**

Document Number 9896 050 60201

12 April 1999

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Philips  
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**PHILIPS**

**Issued by:**

Philips Medical Systems Nederland B.V.  
Integrated Clinical Solutions, Marketing & Communications  
Building QP-0233  
P.O. Box 10.000  
5680 DA Best  
The Netherlands  
Tel.: +31 40 2763827  
Fax.: +31 40 2763810  
email: dicom@best.ms.philips.com

Internet (with the latest versions of Conformance Statements and other DICOM information):

<http://www.philips.com/ms/solution/connect>

[ftp://ftp.philips.com/pub/ms/dicom/Conformance\\_Stmnts](ftp://ftp.philips.com/pub/ms/dicom/Conformance_Stmnts)

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# 1 Introduction

This chapter provides general information about the purpose, scope and contents of this Conformance Statement.

## 1.1 Scope and field of application

The scope of this DICOM Conformance Statement is to facilitate data exchange with equipment of Philips Medical Systems. This document specifies the compliance to the DICOM standard (formally called the NEMA PS 3.X-1996 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) 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 [DICOM]. The conformance to the DICOM standard is a key element of the Inturis Program (see [INTURIS]).

## 1.2 Intended audience

This Conformance Statement is intended for:

- (potential) customers,
- system integrators of medical equipment,
- marketing staff interested in system functionality,
- software designers 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 chapter 2 through 7 and follows the contents and structuring requirements of DICOM PS 3.2-1996.

## 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 3.3-1996 and PS 3.4-1996.

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 1996  
National Electrical Manufacturers Association (NEMA) Publication Sales  
1300 N. 17th Street, Suite 1847  
Rosslyn, Va. 22209, United States of America

[INTURIS] Inturis for Cardiology  
On-Line Image Access  
Doc. nr. 4522 982 69681  
Philips medical Systems Ned. BV

### 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 of Philips equipment with non-Philips equipment. 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).

## Introduction

**1.7 General Acronyms and Abbreviations.**

The following acronyms and abbreviations are used in the document.

- ACC American College of Cardiology
- AE Application Entity
- ACR American College of Radiology
- ANSI American National Standard Institute
- BOT Basic Offset Table
- CD-R CD Recordable
- CD-M CD Medical
- DCI Digital Cardio Imaging
- DCR Dynamic Cardio Review
- DICOM Digital Imaging and Communication in Medicine
- DIMSE DICOM Message Service Element
- DIMSE-C DICOM Message Service Element-Composite
- DIMSE-N DICOM Message Service Element-Normalized
- ELE Explicit VR Little Endian
- EBE Explicit VR Big Endian
- FSC File Set Creator
- GUI Graphic User Interface
- HIS Hospital Information System
- HL7 Health Level Seven
- ILE Implicit VR Little Endian
- IOD Information Object Definition
- ISIS Information System - Imaging System
- MPPS Modality Performed Procedure Step
- NEMA National Electrical Manufacturers Association
- PACS Picture Archiving and Communication System
- PDU Protocol Data Unit
- RIS Radiology Information System
- RWA Real World Activity
- SC Secondary Capture
- SCM Study Component Management
- 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

*EasyWeb* is a single application entity that stores images sent to it by service class users, and simplifies the images into a format that can be viewed in a web browser.

### 2.1 Application Data Flow Diagram

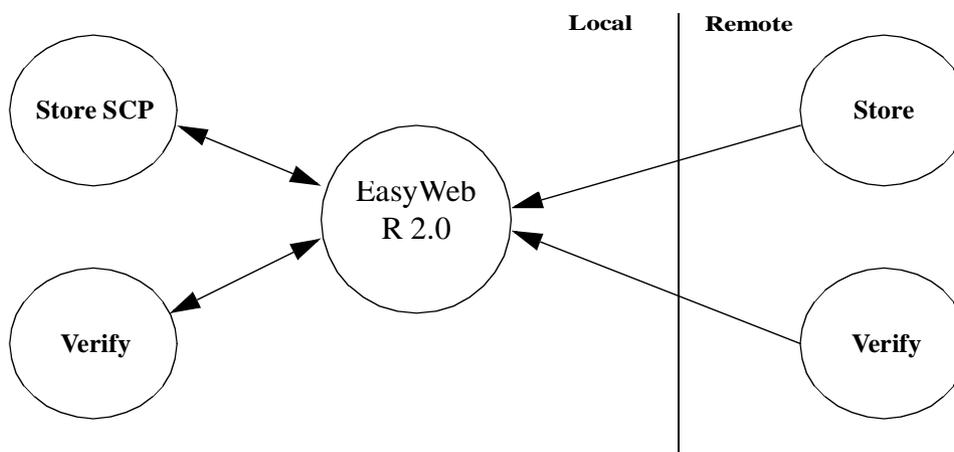


Figure 2-1: Application data Flow Diagram

### 2.2 Functional definition of Application Entities

#### 2.2.1 Receive Images

EasyWeb stores a received image in its entirety, without change, in its internal data store. EasyWeb stores each image with the File Meta Information attached to it.

### 3 AE Specifications

#### 3.1 EasyWeb Specification.

##### 3.1.1 Verification as a SCP.

The EasyWeb provides Standard Conformance to the following DICOM 3.0 SOP class as a SCP:

**Table 3-1: Supported SOP class by the Modality AE as SCP**

<i>SOP class Name</i>	<i>UID</i>
Verification	1.2.840.10008.1.1

##### 3.1.2 Default Transfer Syntaxes

EasyWeb supports the default transfer syntaxes displayed in Table 3-2.

**Table 3-2: Default Transfer Syntaxes**

<i>SOP class Name</i>	<i>UID</i>
DICOM Implicit VR Little Endian	1.2.840.10008.1.2

##### 3.1.3 Storage as SCP

Table 4 lists the SOP Classes that are supported by *EasyWeb* for storage services. In general, EasyWeb supports all image SOP classes recognized by DICOM, with the following exceptions:

- Multi-frame images (US and XA)
- Standalone overlays or curves
- Standalone LUTs
- Can not handle “=” character in Patient Name properly.
- Images with the “.” character in the Date field can not be handled by the *EasyWeb*.

**Table 3-3: Storage SOP Classes**

<i>SOP class Name</i>	<i>UID</i>
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1

**Table 3-3: Storage SOP Classes**

<i>SOP class Name</i>	<i>UID</i>
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-ray Radio Fluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2

### 3.1.4 Extended Transfer Syntaxes

EasyWeb supports the extended transfer syntaxes displayed in Table 3-4 for the purpose of storage.

**Table 3-4: Extended Transfer Syntaxes**

<i>SOP class Name</i>	<i>UID</i>
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1
DICOM Little Endian Lossy JPEG	1 1.2.124.113532.1.2.4.50
DICOM Little Endian Lossy JPEG	4 1.2.124.113532.1.2.4.51
DICOM Lossy Lossless JPEG 14-1	1.2.840.10008.1.2.4.70
DICOM RLE Lossless	1.2.840.10008.1.2.5

### 3.1.5 Association Establishment Policies

#### 3.1.5.1 General

The following Application Context Name will be proposed and recognized by *EasyWeb*:

- DICOM 3.0 Application Context **1.2.840.10008.3.1.1.1**

*EasyWeb* contains no limitations for maximum PDU size. The default size is 100 000 bytes.

#### 3.1.5.2 Number of Associations

The maximum number of simultaneous associations accepted by *EasyWeb* is configurable at run time, based on the system resources available. By default, the maximum number of associations is set at 32. There is no inherent limit to the number of associations other than limits imposed by the computer operating system.

#### 3.1.5.3 Asynchronous Nature

*EasyWeb* allows a single outstanding operation on any association. Therefore, *EasyWeb* does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

### 3.1.5.4 Implementation Identifying Information

*EasyWeb* will respond with the following implementation identifying parameters:

- Implementation Class UID **1.2.124.113532.3510**
- Implementation Version Name **MITRAJUNE1997**

### 3.1.5.5 Called Titles

*EasyWeb* can be configured to validate the Called Title of the requesting SCU during association negotiation.

### 3.1.6 Association Acceptance Policy

#### 3.1.6.1 Real World Activity - Verification

##### 3.1.6.1.1 Associated Real World Activity - Verification

*EasyWeb* will respond to **Verification** requests to provide an SCU with the ability to determine if *EasyWeb* is receiving DICOM requests.

##### 3.1.6.1.2 Presenting Context Table - Verification

*EasyWeb* will accept any of the Presentation Contexts listed in Table 6 for Verification.

**Table 3-5: Presentation Context**

<i>SOP class Name</i>	<i>Transfer Syntax</i>	<i>Role</i>	<i>Extended Negotiation</i>
Table 3-1	Table 3-2	SCP	None

##### 3.1.6.1.3 SOP Specific Conformance - Verification

*EasyWeb* provides standard conformance to the DICOM **Verification Service Class**. *EasyWeb* returns one of the following status codes.

**Table 3-6: Verification status codes**

<i>Service Status</i>	<i>Further Meaning</i>	<i>Protocol Codes</i>	<i>Related Fields</i>	<i>Description</i>
Success	Success	0000		Operation performed properly.

##### 3.1.6.1.4 Presentation Context Acceptance Criterion - Verification

*EasyWeb* will always accept a Presentation Context for the Verification SOP Class with the default DICOM transfer syntax listed in Table 3-2.

##### 3.1.6.1.5 Transfer Syntax Selection Policies - Verification

Since no DICOM data object is associated with a **Verification** command, only the default DICOM transfer syntax is required/supported.

### 3.1.6.2 Real World Activity - Storage

#### 3.1.6.2.1 Associated Real World Activity - Storage

*EasyWeb* will store images that are sent to it from an *SCU*. Images are stored temporarily in the local cache. Image data in *EasyWeb* is considered inherently transient.

#### 3.1.6.2.2 Presentation Context Table - Storage

*EasyWeb* will accept any of the Presentation Contexts listed in Table 3-7 for Storage.

**Table 3-7: Presentation Context**

<i>SOP class Name</i>	<i>Transfer Syntax</i>	<i>Role</i>	<i>Extended Negotiation</i>
Table 3-3	Table 3-4	SCP	Note 1

Note1: Storage Extended negotiation will is not be supported.

#### 3.1.6.2.3 SOP Specific Conformance - Storage

*EasyWeb* conforms to the DICOM **Storage** Service Class at Level 2 (Full). No elements are discarded or coerced by *EasyWeb*. In the event of a successful **C-STORE** operation, the image has been written to internal storage.

*EasyWeb* returns one of the following status codes.

**Table 3-8: C-Store status codes**

<i>Service Status</i>	<i>Further Meaning</i>	<i>Protocol Codes</i>	<i>Related Fields</i>	<i>Description</i>
Refused	Out of resources	A700		Indicates that there was not enough storage space to store the image. Recovery from this condition is left to the administrative functions.
	SOP Class not supported	A800		Indicates that the SOP Class of the Image in the C-STORE operation did not match the Abstract Syntax negotiated for the Presentation Context.
Error	Data set does not match SOP Class	A900		Indicates that the Data Set does not encode an instance of the SOP Class specified.
	Failed	C000		The operation was not successful.
	Cannot understand	C005		Indicates that the Data Set cannot be parsed into elements.

**Table 3-8: C-Store status codes**

<i>Service Status</i>	<i>Further Meaning</i>	<i>Protocol Codes</i>	<i>Related Fields</i>	<i>Description</i>
Warning	Data set does not match SOP Class	B007		match SOP Class Indicates that the Data Set does not match the SOP Class, but that the image was stored anyway.
	Duplicate SOP Instance UID	D000		Instance UID Indicates that the SOP Instance UID of the specified image is already stored in the database.
Success	Success	0000		Operation performed properly.

**3.1.6.2.4 Presentation Context Acceptance Criterion - Storage**

*EasyWeb* will accept any number of **Storage** Presentation Contexts per association request. Any one Abstract Syntax may be specified more than once in an association request, if the Transfer Syntaxes differs between the Presentation Contexts.

**3.1.6.2.5 Transfer Syntax Selection Policies - Storage**

*EasyWeb* supports all transfer syntaxes listed in Table 3-4

## 4 Communication Profiles

*EasyWeb* provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

### 4.1 TCP/IP Stack

*EasyWeb* inherits its TCP/IP stack from the computer system upon which it executes.

#### 4.1.1 Physical Media Support

*EasyWeb* is indifferent to the physical medium over which TCP/IP executes; it inherits the medium from the computer system upon which it executes.

## 5 Extensions /Specialization/Privatization

none.

## 6 Configuration

*EasyWeb* obtains configuration information from the following sources:

- Mapping from Application Entity Title to Presentation Address is provided by the database. Along with this mapping, the database stores those AE titles that are allowed to communicate with *EasyWeb*.

## 7 Support of Extended Character Sets

*EasyWeb* is known to support the following extended character sets:

- ISO-IR 100 Latin Alphabet No. 1