

**Canon**

# DR Image Viewer System

DICOM Conformance Statement

# To Customers

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1. Canon reserves the right to change the specifications of the product without prior notice.

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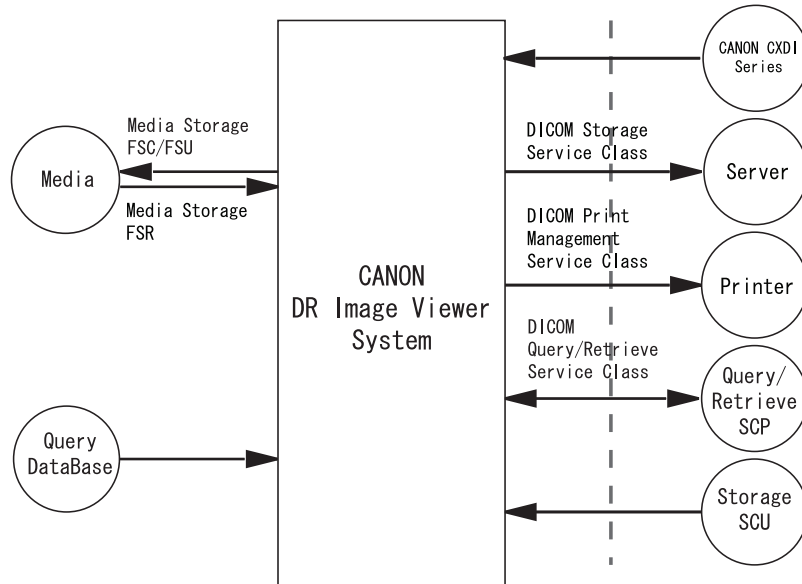
## 0. Introduction

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This Conformance Statement specifies the Canon DR Image Viewer Systems Ver.5.0 DICOM Storage Service Class SCP/SCU, DICOM Print Management Service Class SCU, DICOM Query/Retrieve Service Class SCU and Media Storage Service Class FSC/FSR/FSU compliance to DICOM V3.0.

# 1. Implementational Model

## 1.1 Application Data Flow Diagram



## 1.2 Functional Definition of AE's

- The Canon DR Image Viewer System receives image data (CR Image or DX Image) sent from the Canon CXDI series.
- When the Canon DR Image Viewer System is directed to read image data in a medium, it reads the image data by Media Storage FSR.
- When the Canon DR Image Viewer System is directed to write image data in a medium, it writes the image data by Media Storage FSC.
- When the Canon DR Image Viewer System is directed to send image data, it sends the image data to the server by using DICOM Storage Service Class, or to the printer by using DICOM Print Management Service Class.
- When the Canon DR Image Viewer System is directed to query or retrieve the image data, it sends an association request to the external AE by using Query/Retrieve Service Class.

## 1.3 Sequencing of Real-World Activities

Not applicable.

## 2. AE Specifications

Canon DR Image Viewer System generates a single association establishment request and operates as application entity.

### 2.1 AE Specifications of Canon DR Image Viewer System

Canon DR Image Viewer System is defined by the following SOP:

SOP Class Name	SOP Class UID	Role
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	SCU/SCP
Digital X-Ray Image Storage - For presentation	1.2.840.10008.5.1.4.1.1.1.1	SCU/SCP
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	SCU

Also, the SOP Class of the above Basic Grayscale Print Management Meta is defined as follows:

Basic Grayscale Print Management Meta SOP Class		
SOP Class Name	SOP Class UID	Comment
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	See Appendix.
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	
Printer SOP Class	1.2.840.10008.5.1.1.16	Used for collecting printer information when DICOM Printer Service is used
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Enabled when -Q is written on the parameter. The image and the printer, however, must support P-Value

Query/Retrieve (option) is defined by the following SOP:

SOP Class SCU	
SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Patient Root Query/Retrieve Information Model FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model MOVE	1.2.840.10008.5.1.4.1.2.1.2

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Storage Service Class SCU/SCP supports the following Transfer Syntax:

Transfer Syntax		
UID Name	UID Value	Comment
Implicit VR Little Endian	1.2.840.10008.1.2	

## 2.1.1 Association Establishment Policies

### 2.1.1.1 General

Canon DR Image Viewer System generates association establishment request for the server or the printer when image data (CR Image or DX Image) to be sent is acquired.

### 2.1.1.2 Number of Associations

Canon DR Image Viewer System generates a single association establishment request.

### 2.1.1.3 Asynchronous Nature

Asynchronous mode is not supported.

### 2.1.1.4 Implementation Identifying Information

Implementation Class UID for Canon DR Image Viewer System is:  
1.2.392.200046.100.11  
Implementation version name differs according to the setting.

## 2.1.2 Association Acceptance Policy

Canon DR Image Viewer System establishes association by sending establishment request to the server or printer when image data (CR Image or DX Image) to be sent is acquired.

### 2.1.2.1 Related Real-World Activity

- Print Management Service Class  
 AE sends N-CREATE request for making film session and film box.  
 Then, it sends N-SET request for sending image data.  
 Finally, it sends N-ACTION request for printing the image on film, and N-DELETE for deleting the film session.
- Storage Service Class  
 AE sends C-STORE request for sending image.
- Query/Retrieve Service Class  
 AE sends C-FIND request at the Patient level, Study level and Series level for obtaining Series information. Then, it sends C-MOVE request at the Series level for moving the image.  
 Each level attributes are the following.

#### PATIENT LEVEL ATTRIBUTES FOR THE PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type (DICOM Standard)	Type (This Software)
Patient Name	(0010, 0010)	R	R
Patient ID	(0010, 0020)	U	U
Referenced Patient Sequence	(0008, 1120)	O	Not available
>Referenced SOP Class UID	(0008, 1150)	O	Not available
>Referenced SOP Instance UID	(0008, 1155)	O	Not available
Patients Birth Date	(0010, 0030)	O	U (Unable to set on the GUI)
Patients Birth Time	(0010, 0032)	O	Not available
Patients Sex	(0010, 0040)	O	Not available
Other Patient Ids	(0010, 1000)	O	Not available
Other Patient Names	(0010, 1001)	O	Not available
Ethnic Group	(0010, 2160)	O	Not available
Patient Comments	(0010, 4000)	O	Not available
Number of Patient Related Studies	(0020, 1200)	O	O
Number of Patient Related Series	(0020, 1202)	O	O
Number of Patient Related Instances	(0020, 1204)	O	O
All Other Attributes at Patient Level		O	Not available

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STUDY LEVEL KEYS FOR THE PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type (DICOM Standard)	Type (This Software)
Study Date	(0008, 0020)	R	R
Study Time	(0008, 0030)	R	R
Accession Number	(0008, 0050)	R	R
Study ID	(0020, 0010)	R	R
Study Instance UID	(0020, 000D)	R	R
Modalities in Study	(0008, 0061)	O	Not available
SOP Classes in Study	(0008, 0062)	O	Not available
Referring Physicians Name	(0008, 0090)	O	Not available
Study Description	(0008, 1030)	O	Not available
Procedure Code Sequence	(0008, 1032)	O	Not available
>Code Value	(0008, 0100)	O	Not available
>Coding Scheme Designator	(0008, 0102)	O	Not available
>Coding Scheme Version	(0008, 0103)	O	Not available
>Code Meaning	(0008, 0104)	O	Not available
Name of Physician(s) Reading Study	(0008, 1060)	O	Not available
Admitting Diagnoses Description	(0008, 1080)	O	Not available
Referenced Study Sequence	(0008, 1110)	O	Not available
>Referenced SOP Class UID	(0008, 1150)	O	Not available
>Referenced SOP Instance UID	(0008, 1155)	O	Not available
Issuer of Patient ID	(0010, 0021)	O	Not available
Patients Age	(0010, 1010)	O	Not available
Patients Size	(0010, 1020)	O	Not available
Patients Weight	(0010, 1030)	O	Not available
Occupation	(0010, 2180)	O	Not available
Additional Patient History	(0010, 21B0)	O	Not available
Other Study Numbers	(0020, 1070)	O	Not available
Number of Study Related Series	(0020, 1206)	O	Not available
Number of Study Related Instances	(0020, 1208)	O	Not available
Interpretation Author	(4008, 010C)	O	Not available
All Other Attributes at Study Level		O	Not available

SERIES LEVEL ATTRIBUTES FOR THE PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type (DICOM Standard)	Type (This Software)
Modality	(0008, 0060)	R	R
Series Number	(0020, 0011)	R	R
Series Instance UID	(0020, 000E)	U	U
Number of Series Related Instances	(0020, 1209)	O	Not available
All Other Attributes at Series Level		O	Not available

C-MOVE request is executed only at the Series level of the Query/Retrieve information model.

- Media Storage Service Class  
 When the AE is requested to read the image, the image is read from the CD or DVD as an FSR and is registered to the Canon DR Image Viewer System.  
 When the system is directed to write to a DVD-RAM, a DICOMDIR file is generated as an FSC if the disc is a new media, or an existing DICOMDIR file is updated as an FSC if the file already exists. (Separate support for writing to a CD-R is also provided by using the OS functions or CD-writing software.)

APPLICATION PROFILES

Application Profiles Supported	Real World Activity	Role	SC Option
STD-GEN-CD	Reading from media	FSR	Interchange
STD-GEN-DVD-RAM	Reading from media	FSR	Interchange
	Writing to media	FSC	Interchange
	Additional writing to media	FSU	Interchange

STD-GEN-CD (FSR) AND STD-GEN-DVD-RAM (FSC, FSU, FSR) SUPPORT THE TRANSFER SYNTAX BELOW

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless Process 14	1.2.840.10008.1.2.4.70
Digital X-Ray Image Storage - For Presentaion	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless Process 14	1.2.840.10008.1.2.4.70

## **3. Communication Profiles**

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### **3.1 Supported Communication Stack**

Canon DR Image Viewer System provides DICOM V3.0 TCP/IP network communication support as stated in DICOM Standard Part 8.

### **3.2 TCP/IP Stack**

Canon DR Image Viewer System inherits TCP/IP stack.

### **3.3 Physical Media Support**

Canon DR Image Viewer System supports 10BASE-T, 100BASE-TX, 10BASE-2 (option) and 10BASE-5 (option) of ETHERNET™.

Also, it supports other protocols depending on the computer being used.

# 4. Extension/Specialization/Privatization

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Not applicable.

## 5. Configurable Parameters

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Canon DR Image Viewer System can set the following environmental configuration information:

CALLING APP TITLE

CALLED APP TITLE

HOST NAME

PORT NUMBER

## 6. Support of Extended Character Sets

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Canon DR Image Viewer System supports extended character sets.

### DEFINED TERMS FOR SINGLE-BYTE CHARACTER SETS WITHOUT CODE EXTENSIONS

Character Set Description	Defined Term	ISO registration number	Number of characters	Code element	Character Set
Default repertoire	none	ISO-IR 6	94	G0	ISO 646
Latin alphabet No.1	ISO_IR 100	ISO-IR 100	96	G1	Supplementary set of ISO 8859
		ISO-IR 6	94	G0	ISO 646
Latin alphabet No.2	ISO_IR 101	ISO-IR 101	96	G1	Supplementary set of ISO 8859
		ISO-IR 6	94	G0	ISO 646
Cyrillic	ISO_IR 144	ISO-IR 144	96	G1	Supplementary set of ISO 8859
		ISO-IR 6	94	G0	ISO 646

### DEFINED TERMS FOR SINGLE-BYTE CHARACTER SETS WITH CODE EXTENSIONS

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	ISO registration number	Number of characters	Code element	Character Set
Default repertoire	ISO 2022 IR 6	ISO 2022	ESC 02/08 04/02	ISO-IR 6	94	G0	ISO 646

# 7. Entity

## 7.1 IOD Modules

### 7.1.1 CR Image IOD Modules

These modules have the same status that is output from the CXDI Series, and so refer to the CXDI Series DICOM Conformance Statement.

### 7.1.2 DX Image IOD Modules

These modules have the same status that is output from the CXDI Series, and so refer to the CXDI Series DICOM Conformance Statement.

### 7.1.3 Media Storage Directory IOD Modules

Object	Module/Key	Reference	Usage
DICOM File Meta Information		7.1.3.1	M
Basic Directory Information Object	File-set Identification Module	7.1.3.2	M
	Directory Information Module	7.1.3.3	U
Definition of Specific Directory Records	PATIENT keys	7.1.3.4	M
	STUDY keys	7.1.3.5	M
	SERIES keys	7.1.3.6	M
	IMAGE keys	7.1.3.7	M

#### 7.1.3.1 DICOM File Meta Information of Directory IOD

Attribute Name	Tag	Type	Value
File Preamble		1	
DICOM Prefix		1	
Group Length	(0002, 0000)	1	Size of meta information that follows
File Meta Information Version	(0002, 0001)	1	0100H
Media Storage SOP Class UID	(0002, 0002)	1	1.2.840.10008.1.3.10
Media Storage SOP Instance UID	(0002, 0003)	1	Media Storage SOP Instance UID
Transfer Syntax UID	(0002, 0010)	1	1.2.840.10008.1.2.1
Implementation Class UID	(0002, 0012)	1	1.2.392.200046.100.11

#### 7.1.3.2 File-set Identification Module

Attribute Name	Tag	Type	Value
File-set ID	(0004, 1130)	2	CANON_DRIV_DIR

7.1.3.3 Directory Information Module

Attribute Name	Tag	Type	Value
Offset of the First Directory Record of the Root Directory Entity	(0004, 1200)	1	Offset of first "patient directory record"
Offset of the Last Directory Record of the Root Directory Entity	(0004, 1202)	1	Offset value of last "patient directory record"
File-set Consistency Flag	(0004, 1212)	1	0000H: No conflict FFFFH: Conflict found
Directory Record Sequence	(0004, 1220)	2	Directory record sequence
> Offset of the Next Directory Record	(0004, 1400)	1C	Offset of next record
> Record In-use Flag	(0004, 1410)	1C	FFFFH
> Offset of Referenced Lower-Level Directory Entity	(0004, 1420)	1C	Offset of lower-level directory record "0" when the "Directory Record Type" is "IMAGE"
> Directory Record Type	(0004, 1430)	1C	any of the following PATIENT, STUDY, SERIES, IMAGE
> Referenced File ID	(0004, 1500)	1C	Storage location of image file referenced by directory record when the "Directory Record Type" is "IMAGE" Ex.: DRIVDIR\I0000000
> Referenced SOP Class UID in File	(0004, 1510)	1C	SOP Class UID of image file referenced by directory record when the "Directory Record Type" is "IMAGE"
> Referenced SOP Instance UID in File	(0004, 1511)	1C	SOP Instance UID of image file referenced by directory record when the "Directory Record Type" is "IMAGE"
> Referenced Transfer Syntax UID in File	(0004, 1512)	1C	Transfer Syntax UID of image file referenced by directory record when the "Directory Record Type" is "IMAGE"
> Record Selection Keys	Refer to the following		

### 7.1.3.4 PATIENT Keys

Attribute Name	Tag	Type	Value
Specific Character Set	(0008, 0005)	1C	Required when extension or replacement character set is used in the keys
Patient's Name	(0010, 0010)	2	Patient's Name
Patient ID	(0010, 0020)	1	Patient ID Becomes underscore “_” when the option for deleting patient information at DICOMDIR output is enabled
Patient's Birth Date	(0010, 0030)	3	Patient's Birth Date (YYYYMMDD) Becomes blank when the option for deleting patient information at DICOMDIR output is enabled
Patient's Sex	(0010, 0040)	3	Patient's Sex M, F, or O Becomes blank when the option for deleting patient information at DICOMDIR output is enabled

### 7.1.3.5 STUDY Keys

Attribute Name	Tag	Type	Value
Specific Character Set	(0008, 0005)	1C	Required when extension or replacement character set is used in the keys
Study Date	(0008, 0020)	2	Study Date (YYYYMMDD)
Study Time	(0008, 0030)	2	Study Time (HHMMSS.000000)
Study Description	(0008, 1030)	2	Study Description
Study Instance UID	(0020, 000D)	1C	Study Instance UID
Study ID	(0020, 0010)	1	Internal study number
Accession Number	(0008, 0050)	2	Study order number generated by RIS or HIS

### 7.1.3.6 SERIES Keys

Attribute Name	Tag	Type	Value
Specific Character Set	(0008, 0005)	1C	Required when extension or replacement character set is used in the keys
Modality	(0008, 0060)	1	CR or DX (based on CXDI settings)
Series Instance UID	(0020, 000E)	1	Series Number
Series Number	(0020, 0011)	1	Series Number

### 7.1.3.7 IMAGE Keys

Attribute Name	Tag	Type	Value
Specific Character Set	(0008, 0005)	1C	Required when extension or replacement character set is used in the keys
Instance Number	(0020, 0013)	1	Image number
SOP Instance UID	(0008, 0018)	3	SOP Instance UID

## 8. C-STORE Statuses

The following table defines the specific status code values which might be returned in a C-STORE response.

Service Status	Further Meaning	Status Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Error	Data Set does not match SOP Class	A900	(0000,0901) (0000,0902)
	Cannot understand	C000	(0000,0901) (0000,0902)
Warning	Coercion of Data Elements	B000	(0000,0901) (0000,0902)
	Data Set does not match SOP Class	B007	(0000,0901) (0000,0902)
	Elements Discarded	B006	(0000,0901) (0000,0902)
Success		0000	None

Unique status codes are as follows:

Status Codes	Further Meaning	Service Status
A701	You do not have the privileges to execute a S.P.	Refused
A702	Failed to register to the database.	Refused
A703	The same SOP instance UID has been existed	Refused
A704	This study cannot be overwritten because this study already has a report.	Refused
A901	Patient name is not entered.	Error
A902	Patient birth date is not entered.	Error
A903	Patient sex is not entered.	Error
A911	Patient name is mismatched.	Error
A912	The third string of patient name is mismatched.	Error
A913	Patient birth date is mismatched.	Error
A914	Patient sex is mismatched.	Error
C111	A date couldn't be changed into the datetime type.	Error
C112	Image Rows or Columns is 0.	Error
C113	ImageSizetype is 0.	Error

# Appendix: Print Format

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Common to PORTLAIT and LANDSCAPE

Print Format	8 x 10	10 x 12	11 x 14	14 x 14	14 x 17
STANDARD \1,1	O	O	O	O	O
STANDARD \1,2	O	O	O	O	O
STANDARD \2,1	O	O	O	O	O
STANDARD \2,2	O	O	O	O	O
STANDARD \2,3	O	O	O	O	O
STANDARD \3,2	O	O	O	O	O
STANDARD \3,3	O	O	O	O	O
STANDARD \3,4	O	O	O	O	O
STANDARD \4,3	O	O	O	O	O

NOTE: There are some formats that cannot be output due to the printer settings.









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