Canon

CANON CXDI Control Software (RD)

DICOM Conformance Statement

To Customers

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

- System and product names in this manual are the trademarks of each manufacturer that developed them.

0. Introduction

This Conformance Statement specifies the Canon CXDI Control Software (RD) compliance to DICOM V3.0.

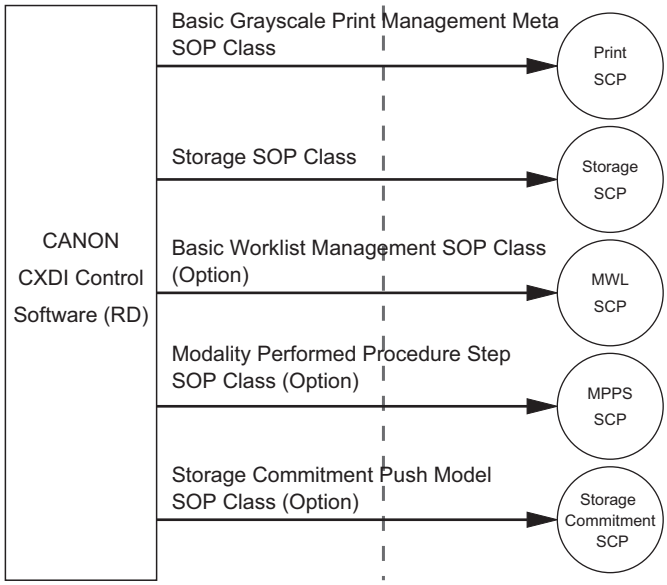
NOTE: Some settings must be changed by the service engineer in order to use or change the function marked with a “*”.

1. Implementational Model

Canon CXDI Control Software (RD) directly digitizes the X-ray image data (CR or DX image) by using the flat panel detector, and sends the Digital Radiography image data by using DICOM Storage Service Class or DICOM Print Management Service Class.

1.1 Application Data Flow Diagram

Canon CXDI Control Software (RD) sends acquired image data (CR or DX image) to the server by using Storage Service Class, or to the printer by using Print Management Service Class.



1.2 Functional Definition of AE's

Canon CXDI Control Software (RD) captures an image and processes the image by the operation from the operation unit.
When image data (CR or DX image) is captured, it is sent to the server by using Storage Service Class, or it is sent to the printer by using Print Management Service Class.

1.3 Sequencing of Real-World Activities

Not applicable.

2. AE Specifications

Canon CXDI Control Software (RD) generates a single association establishment request and operates as application entity.

2.1 AE Specifications

Canon CXDI Control Software (RD) is defined by the following SOP:

SOP Class as SCU	
UID Name	UID Value
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital X-ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Annotation Box SOP Class	1.2.840.10008.5.1.1.15

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	
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.

Canon CXDI Control Software (RD) supports the following Transfer Syntax:

Transfer Syntax		
UID Name	UID Value	Comment
Implicit VR Little Endian	1.2.840.10008.1.2	
JPEG Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12 Bit Image Compression (Process 4 only)*	1.2.840.10008.1.2.4.51	Settings need to be changed by the service engineer when they are going to be used in DICOM Storage Service.
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression*	1.2.840.10008.1.2.4.70	

2.1.1 Association Establishment Policies

2.1.1.1 General

Canon CXDI Control Software (RD) generates association establishment request for the server or the printer when image data (CR or DX image) to be sent is acquired. Maximum size of PDU which is used is 128K*.

2.1.1.2 Number of Associations

Canon CXDI Control Software (RD) generates 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 CXDI Control Software (RD) is "1.2.392.200046.100.2.xxxxx (version number of CXDI sensor unit)".
Implementation version name is "CANON CXDI xxxxx (version number of CXDI sensor unit)".

2.1.1.5 Implementation Identifying Information (Storage Commitment) (Option)

Implementation Class UID is "1.2.392.200046.100.2.1.xxxxx (version number of Commit.exe)".
Implementation version name is "COMMIT xxxxx (version number of Commit.exe)".

2.1.2 Association Acceptance Policy

Canon CXDI Control Software (RD) establishes association by sending establishment request to the server or printer when image data (CR or DX image) to be sent is acquired.

2.1.2.1 Related Real-World Activity

- Storage Service Class
  When the study is completed, AE sends C-STORE request for sending image.
- Print Service Class
  When the study is completed, 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 Commitment Service Class (Option)
  AE sends N-ACTION request for commissioning captured images storage.
  Then, it confirms the storage conditions of the captured images by receiving N-EVENT-REPORT from the storage destination.

3. Communication Profiles

3.1 Supported Communication Stack

Canon CXDI Control Software (RD) provides DICOM V3.0 TCP/IP network communication support as stated in DICOM Standard Part 8.

3.2 TCP/IP Stack

Canon CXDI Control Software (RD) inherits TCP/IP stack.

3.3 The Basic TLS Secure Transport Profile

To use DICOM secure communication, the Application Entities support the Basic TLS Secure Transport Profile. IP ports on which the profiles use TLS connections are configurable by the CXDI application user.

Supported TLS Feature	Minimum Mechanism
Entity Authentication	RSA based certificates
Exchange of Master Secrets	RSA
Data Integrity	SHA
Privacy	Triple DES EDE, CBC, AES-128

Three cipher suite options are offered during TLS negotiation by the CXDI application that comply with this profile:
TLS_RSA_WITH_AES_128_CBC_SHA
TLS_RSA_WITH_3DES_EDE_CBC_SHA
TLS_RSA_WITH_NULL_SHA

When an integrity check fails, the connection is dropped and an A-P-ABORT indication to the DICOM upper layer is issued. The provider reason on the DICOM is 0 (NO_REASON), see syslog file.

3.3.1 Key Management

Keys and Certificates are provided by the person who manages the network infrastructure or service persons, and are available in file. Their format is based on X.509 DER (Distinguished Encoding Rule). And, private keys may be stored in encrypted with pass-phrase.
The validation process attempts to check a certification chain up to the self-signed root certificate authority (CA) certificate in srv-certs folder in the CXDI application-working folder.

4. Extension / Specialization / Privatization

Not applicable.

5. Configurable Parameters

Following environmental configuration information can be set from the Operation Unit:
CALLED AE TITLE
HOST NAME
PORT #

6. Support of Extended Character Sets

Canon CXDI Control Software (RD) supports extended character sets.

Character Set Description	Defined Term
Default repertoire	(None)
	ISO 2022 IR6
Japanese	ISO_IR 13
	ISO_IR 14
	ISO 2022 IR 13
	ISO 2022 IR 87
Latin alphabet No. 1	ISO_IR 100
Latin alphabet No. 2	ISO_IR 101
Latin alphabet No. 4	ISO_IR 110
Greek	ISO_IR 126
Cyrillic	ISO_IR 144
Latin alphabet No. 5	ISO_IR 148

7. Entity

7.1 IOD Module

Canon CXDI Control Software (RD) uses the following IOD module:

Information Entities	Module
Patient	Patient
Study	General Study
	Patient Study
Series	General Series
	CR Series
	DX Series
Equipment	General Equipment
Image	General Image
	Image Plane (*)
	Image Pixel
	CR Image
	DX Image
	Private Elements
	X-Ray Acquisition (*)
	VOI LUT
	SOP Common

7.2 Value Representation

VR (Value Representation) is as follows:

VR	Format	Data Length (Byte)
AS (Age String)	nnnY, nnnM, nnnW, nnnD	4
AE (Application Entity)		16 (max.)
CS (Code String)		16 (max.)
DA (Date)	YYYYMMDD	8
DS (Decimal String)	+xxx.xxxx, -xxx.xxxxx, etc.	16 (max.)
DT (Date Time)	YYYYMMDDHHMMSS.FFFFFF	26 (max.)
FL (Floating Point Single)		4
FD (Floating Point Double)		8
IS (Integer Sting)		12 (max.)
LO (Long String)		64 (max.)
LT (Long Text)		10,240 (max.)
OB (Other Byte String)		Differs according to the transfer syntax.
OW (Other Word String)		Differs according to the transfer syntax.
PN (Person Name)		64 (max.) / component
SH (Short String)		16 (max.)
ST (Short Text)		1,024 (max.)
TM (Time)	HHMMSS.FFFFFF	16 (max.)
UI (Unique Identifier)		64 (max.)
UL (Unsigned Long)		4
US (Unsigned Short)		2

7.3 Data Element Type

Each elements in this system for TYPE will be handled as follows:

TYPE	Handling
1	Value is always sent with Tag.
1C	Value is sent with Tag under a certain condition.
2	Value is sent with Tag. However, when Value is unknown, it will be sent as a text string of length 0.
2C	It will be handled in the same way as TYPE2 under a certain condition.
3	Value is sent with Tag. However, when Value is unknown, it will be sent as a text string of length 0, or the element itself will not be sent.

7.4 IOD Module Tables

Canon CXDI Control Software (RD) uses following IOD modules:

7.4.1 CR Image IOD Modules

IE	Module	Reference	Usage
Patient	Patient	7.4.4	M
	Clinical Trail Subject	N/A	U
Study	General Study	7.4.5	M
	Patient Study	7.4.6	U
	Clinical Trail Study	N/A	U
Series	General Series	7.4.7	M
	CR Series	7.4.8	M
	Clinical Trail Series	N/A	U
Equipment	General Equipment	7.4.10	M
Image	General Image	7.4.11	M
	Image Pixel	7.4.13	M
	Contrast/bolus	N/A	U
	Device	N/A	U
	CR Image	7.4.14	M
	Overlay Plane	N/A	U
	Modality LUT	7.4.16	U
	VOI LUT	7.4.15	U
	Private Elements	7.4.17	U
	SOP Common	7.4.18	M

7.4.2 DX Image IOD Modules

IE	Module	Reference	Usage
Patient	Patient	7.4.4	M
	Specimen Identification	N/A	U
	Clinical Trail Subject	N/A	U
Study	General Study	7.4.5	M
	Patient Study	7.4.6	U
	Clinical Trail Study	N/A	U
Series	General Series	7.4.7	M
	Clinical Trail Series	N/A	U
	DX Series	7.4.9	M
Frame of Reference	Frame of Reference	N/A	U
Equipment	General Equipment	7.4.10	M
Image	General Image	7.4.11	M
	Image Pixel	7.4.13	M
	Contrast/bolus	N/A	U
	Display Shutter	N/A	U
	Device	N/A	U
	Intervention	N/A	U
	DX Anatomy Imaged	7.4.19	M
	DX Image	7.4.20	M
	DX Detector	7.4.21	M
	X-Ray Collimator	N/A	U
	DX Positioning	7.4.22	U
	X-Ray Tomo Acquisition	N/A	U
	X-Ray Acquisition Dose	7.4.23	U
	X-Ray Generation	7.4.24	U
	X-Ray Filtration	7.4.25	U
	X-Ray Grid	7.4.27	U
	Overlay Plane	N/A	C (Required if graphic annotation is present.)
	VOI LUT	7.4.15	C (Required if Presentation Intent Type (0008,0068) is FOR PRESENTATION. Shall not be present otherwise.)
	Image Histogram	N/A	U
	Acquisition Context	7.4.26	M
	Private Elements	7.4.17	U
	SOP Common	7.4.18	M

7.4.3 GSPS IOD Modules

IE	Module	Reference	Usage
Patient	Patient	7.4.4	M
	Clinical Trail Subject	N/A	U
Study	General Study	7.4.5	M
	Patient Study	7.4.6	U
	Clinical Trail Study	N/A	U
Series	General Series	7.4.7	M
	Clinical Trail Series	N/A	U
	Presentation Series	7.4.33	M
Equipment	General Equipment	7.4.10	M
Presentation State	Presentation State Identification	7.4.34	M
	Presentation State Relationship	7.4.35	M
	Presentation State Shutter	N/A	M
	Presentation State Mask	N/A	M
	Mask	N/A	C
	Display Shutter	N/A	C
	Bitmap Display Shutter	N/A	C
	Overlay Plane	N/A	C
	Overlay/Curve Activation	N/A	C
	Displayed Area	7.4.36	M
	Graphic Annotation	N/A	C
	Spatial Transformation	N/A	C
	Graphic Layer	N/A	C
	Modality LUT	N/A	C
	Softcopy VOI LUT	N/A	C
	Softcopy Presentation LUT	7.4.38	M
	SOP Common	7.4.18	M

7.4.4 Patient

Attribute Name	Tag	VR	Type	Value
Patient's Name	(0010,0010)	PN	2	Patient's name being entered.
Patient ID	(0010,0020)	LO	2	Patient's ID being entered.
Patient's Birth Date	(0010,0030)	DA	2	Patient's birth date (YYYYMMDD) being entered.
Patient's Sex	(0010,0040)	CS	2	Patient's sex (Male, Female or Unknown) being entered.
Other Patient Ids	(0010,1000)	LO	3	Other patient IDs (output in the service engineer settings)
Patient Comments	(0010,4000)	LT	3	Patient comments (output in the service engineer settings)

7.4.5 General Study

Attribute Name	Tag	VR	Type	Value
Study Instance UID(*)	(0020,000D)	UI	1	1.2.392.200046.100.2.1. (MAC address).(Year, month, day, hour, minute and second) (.(Suffix for GEN/HIS)) • If a value has been received from the RIS, the value receive is output. • If no value has been received from the RIS and the unit is operating in IHE mode, a value internally generated by DMW_PS2 is output. • After images taken using V6.6 or earlier are updated to V7.0 or later, previous generation rules are applied if data is re-transferred.
Study Date	(0008,0020)	DA	2	Date (YYYYMMDD) when study was performed.
Study Time	(0008,0030)	TM	2	Time (HHMMSS.000000) when study was performed.
Referring Physician's Name	(0008,0090)	PN	2	Entered physician's name to refer to. (Physician in charge of the patient)
Study ID	(0020,0010)	SH	2	Entered internal study number. 0040,1001: Obtained from RIS by using DMW_PS2 in normal study Blank: in manual study
Accession Number	(0008,0050)	SH	2	Entered or RIS or HIS generated number which identifies the order for the study.
Study Description	(0008,1030)	LO	2	Entered institution-generated description or classification of the study performed.
Name of Physician(s) Reading Study	(0008,1060)	PN	3	Entered name of the physician(s) reading the study.
Procedure Code Sequence	(0008,1032)	SQ	3	Value received from DMW_PS2 (When DMW_PS2 is used by IHE setting, this tag is output.)
> Code Value	(0008,0100)	SH	1	
> Coding Scheme Designator	(0008,0102)	SH	1	
> Coding Scheme Version	(0008,0103)	SH	1	
> Code Meaning	(0008,0104)	LO	1C	
Referenced Study Sequence	(0008,1110)	SQ	3	
> Referenced SOP Class UID	(0008,1150)	UI	1C	
> Referenced SOP Instance UID	(0008,1155)	UI	1C	

7.4.6 Patient Study

Attribute Name	Tag	VR	Type	Value
Patient's Age	(0010,1010)	AS	3	Entered age of patient.
Patient's Size	(0010,1020)	DS	3	Height of patient, in meters, entered from RIS or HIS.
Patient's Weight	(0010,1030)	DS	3	Weight of patient, in kilograms, entered from RIS or HIS.

7.4.7 General Series

Attribute Name	Tag	VR	Type	Value
Modality	(0008,0060)	CS	1	CR or DX
Series Instance UID	(0020,000E)	UI	1	1.2.392.200046.100.2.1. (MAC address).(Year, month, day, hour, minute and second) (.(Suffix for GEN/HIS)). (Series No.) • After images taken using V6.6 or earlier are updated to V7.0 or later, previous generation rules are applied if data is re-transferred.
Series Number	(0020,0011)	IS	2	A number that identifies this Series.
Laterality	(0020,0060)	CS	2C	(CR only output) Laterality of (patient) body part examined. Required if the body part examines is a paired structure. Enumerated Values: R=right, L=left Tag only output when neither is specified.
Series Date	(0008,0021)	DA	3	Date the series started.
Series Time	(0008,0031)	TM	3	Time the series started.
Protocol Name	(0018,1030)	LO	3	Protocol name entered from RIS or HIS
Series Description	(0008,103E)	LO	3	Entered user provided description of the series.
Operator's Name	(0008,1070)	PN	3	Entered technologist(s) supporting the series.
Body Part Examined	(0018,0015)	CS	3	Body part examined One of the following: SKULL, TSPINE, LSPINE, SSPINE, COCCYX, CHEST, CLAVICLE, BREAST, ABDOMEN, PELVIS, HIP, SHOULDER, ELBOW, KNEE, ANKLE, HAND, FOOT, EXTREMITY, CSPINE, HEAD, HEART, NECK, LEG, ARM, JAW
Referenced Study Component Sequence	(0008,1111)	SQ	3	Value received from DMW_PS2 (When DMW_PS2 is used by IHE setting, this tag is output.)
> Referenced SOP Class UID	(0008,1150)	UI	1C	
> Referenced SOP Instance UID	(0008,1155)	UI	1C	

Attribute Name	Tag	VR	Type	Value
Performed Procedure Step Start Date	(0040,0244)	DA	3	Value received from DMW_PS2 (When DMW_PS2 is used by IHE setting, this tag is output.)
Performed Procedure Step Start Time	(0040,0245)	TM	3	
Performed Procedure Step ID	(0040,0253)	SH	3	
Performed Procedure Step Description	(0040,0254)	LO	3	
Request Attributes Sequence	(0040,0275)	SQ	3	
> Requested Procedure ID	(0040,1001)	SH	1	
> Scheduled Procedure Step ID	(0040,0009)	SH	1	
> Scheduled Procedure Step Description	(0040,0007)	LO	3	
> Scheduled Protocol Code Sequence	(0040,0008)	SQ	3	
>> Code Value	(0008,0100)	SH	1C	
>> Coding Scheme Designator	(0008,0102)	SH	1C	
>> Coding Scheme Version	(0008,0103)	SH	1C	
>> Code Meaning	(0008,0104)	LO	1C	
Performed Protocol Code Sequence	(0040,0260)	SQ	3	
> Code Value	(0008,0100)	SH	1C	
> Coding Scheme Designator	(0008,0102)	SH	1C	
> Coding Scheme Version	(0008,0103)	SH	1C	
> Code Meaning	(0008,0104)	LO	1C	

7.4.8 CR Series

Attribute Name	Tag	VR	Type	Value
View Position	(0018,5101)	CS	2	One of the following: AP=Anterior/Posterior PA=Posterior/Anterior LL=Left Lateral RL=Right Lateral RLD=Right Lateral Decubitus LLD=Left Lateral Decubitus RLO=Right Lateral Oblique LLO=Left Lateral Oblique
Body Part Examined	(0018,0015)	CS	2	Body part examined: One of the following: SKULL, TSPINE, LSPINE, SSPINE, COCCYX, CHEST, CLAVICLE, BREAST, ABDOMEN, PELVIS, HIP, SHOULDER, ELBOW, KNEE, ANKLE, HAND, FOOT, EXTREMITY, CSPINE, HEAD, HEART, NECK, LEG, ARM, JAW
Filter Type	(0018, 1160)	SH	3	Tag only output
Collimator/Grid Name	(0018,1180)	SH	3	Grid ID
Focal Spot	(0018,1190)	DS	3	Entered focal spot size, in mm. For devices with variable focal spot or multiple focal spots, small dimension followed by large dimension.

7.4.9 DX Series

Attribute Name	Tag	VR	Type	Value
Modality	(0008,0060)	CS	1	DX (In General Series Module) Presentation Intent
Presentation Intent Type	(0008,0068)	CS	1	FOR PRESENTATION or FOR PROCESSING
Referenced Study Component Sequence	(0008,1111)	SQ	1C	Value received from DMW_PS2 (When DMW_PS2 is used by IHE setting, this tag is output.)
> Referenced SOP Class UID	(0008,1150)	UI	1C	
> Referenced SOP Instance UID	(0008,1155)	UI	1C	

7.4.10 General Equipment

Attribute Name	Tag	VR	Type	Value
Manufacturer	(0008,0070)	LO	2	Canon Inc.
Institution Name	(0008,0080)	LO	3	Entered institution where the equipment is located.
Station Name	(0008,1010)	SH	3	User defined name identifying the machine that produced the digital images. (Settings of NETWORK HOST NAME)
Institution Department Name	(0008,1040)	LO	3	Tag only output
Manufacturer's Model Name (*)	(0008,1090)	LO	3	CXDI
Device Serial Number (*)	(0018, 1000)	LO	3	Serial number
Software Versions	(0018, 1020)	LO	3	Vx.x.xx (x indicates version number)
Spatial Resolution	(0018,1050)	DS	3	Minimum resolution, in mm.
Date of Last Calibration	(0018,1200)	DA	3	Date (YYYYMMDD) when the last calibration was performed. Tag only output when calibration was not performed.
Time of Last Calibration	(0018,1201)	TM	3	Time (HHMMSS.000000) when the last calibration was performed. Tag only output when calibration was not performed.

7.4.11 General Image

Attribute Name	Tag	VR	Type	Value
Instance Number	(0020,0013)	IS	2	A number that identifies the internal image. Always 1
Patient Orientation	(0020,0020)	CS	2C	Patient orientation (CR only output) Example: L\F
Content Date	(0008,0023)	DA	2C	Content time (Date that CXDI received the exposure completion notification from the sensor) Example: 20070112
Content Time	(0008,0033)	TM	2C	Content time (Time that CXDI received the exposure completion notification from the sensor) Example: 163811.000000
Acquisition Date (*)	(0008,0022)	DA	3	Acquisition date that is output when Output is Yes in the service engineer settings (Date that CXDI received the exposure start notification from the sensor) Example: 20070308
Acquisition Time (*)	(0008,0032)	TM	3	Acquisition time that is output when Output is Yes in the service engineer settings (Time that CXDI received the exposure start notification from the sensor) Example: 164213.000000
Image Comments	(0020,4000)	LT	3	Tag only output
Source Image Sequence	(0008,2112)	SQ	3	Source image sequence Output for DX
> Referenced SOP Class UID	(0008,1150)	UI	1	Referenced SOP Class UID (DX only output) Example: 1.2.840.10008.5.1.4.1.1.1
> Referenced SOP Instance UID	(0008,1155)	UI	1	Referenced SOP Instance UID (DX only output) Example: 1.2.392.200046.100.2.1.82158227306.80613083952.1.1.1
Lossy Image Compression	(0028,2110)	CS	3	Specifies whether an image has undergone lossy compression. Enumerated Values: 00=Image has NOT been subjected to lossy compression. 01=Image has been subjected to lossy compression. (DX only output)
Lossy Image Compression Ratio	(0028,2112)	DS	3	Output when (0028,2110) is 01 Tag itself is not output when lossless compression is specified (DX only output)
Presentation LUT Shape	(2050,0020)	CS	3	IDENTITY (This tag is output only when P-Value setting is included.)

7.4.12 Image Plane

Attribute Name	Tag	VR	Type	Value
Pixel Spacing*	(0028,0030)	DS	3	Pixel pitch of sensor Value that is output varies depending on the service engineer setting Details are below. 0: No output for each tag 1: Image pixel size W, H (mm) (Default) Example: 0.160\0.160 2: Images where the pixel size W, H are corrected to the pixel size at the patient side (mm) Correction system is below. Pixel size × Distance between radiation source and patient ÷ Distance between radiation source and detector * If one of the entered values for the distance is 0.0 or less or they are the same, no correction is performed, and output is identical to option 1.

7.4.13 Image Pixel

Attribute Name	Tag	VR	Type	Value
Samples Per Pixel	(0028,0002)	US	1	1
Rows	(0028,0010)	US	1	Number of pixels in vertical direction of image data
Columns	(0028,0011)	US	1	Number of pixels in horizontal direction of image data
Bits Allocated	(0028,0100)	US	1	16
Bits Stored	(0028,0101)	US	1	12
High Bit	(0028,0102)	US	1	11
Pixel Representation	(0028,0103)	US	1	0
Pixel Data	(7FE0,0010)	OW	1C	A data stream of pixel samples which comprise the image.

7.4.14 CR Image

Attribute Name	Tag	VR	Type	Value
Photometric Interpretation (*)	(0028,0004)	CS	1	Photometric interpretation One of the following is output based on the service engineer setting P-Value Not Included: MONOCHROME1 P-Value Included: MONOCHROME2
KVP	(0018,0060)	DS	3	Peak kilo voltage output of the X-ray generator used.
Distance Source to Detector	(0018,1110)	DS	3	Distance in mm from source to detector center.
Distance Source to Patient	(0018,1111)	IS	3	Distance in mm from source to isocenter (center of field of view.)
Exposure Time	(0018,1150)	IS	3	Time of X-ray exposure, in msec.
X-ray Tube Current	(0018,1151)	IS	3	X-ray tube current, in mA.
Exposure	(0018,1152)	IS	3	The product of exposure time and X-ray tube current expressed in mAs.
Imager Pixel Spacing (*)	(0018,1164)	DS	3	Values that is output varies depending on the service engineer setting. Details are below. 0: No output for each tag 1: Image pixel size W, H (mm) (Default) Example: 0.160\0.160 2: Images where the pixel size W, H are corrected to the pixel size at the patient side (mm) Correction system is below. Pixel size × Distance between radiation source and patient ÷ Distance between radiation source and detector * If one of the entered values for the distance is 0.0 or less or they are the same, no correction is performed, and output is identical to option 1.
Acquisition Device Processing Code	(0018,1401)	LO	3	Code of image processing.
Relative X-ray Exposure	(0018,1405)	IS	3	Outputs the relative X-ray exposure dose EXI (EXP) value Example: 356

7.4.15 VOI LUT

Attribute Name	Tag	VR	Type	Value
Window Center	(0028,1050)	DS	3	Window center value (0-4095) Output value varies depending on the service engineer settings.
Window Width	(0028,1051)	DS	1C	Window width value (1-4096) Output value varies depending on the service engineer settings.
VOI LUT Sequence	(0028,3010)	SQ	3	Defines a sequence of VOI LUTs.
> LUT Descriptor	(0028,3002)	US	1C	Specifies the format of the LUT Data.
> LUT Data	(0028,3006)	US	1C	LUT Data.

7.4.16 Modality LUT

Attribute Name	Tag	VR	Type	Value
Rescale Intercept	(0028,1052)	DS	1C	Rescale intercept If Use Rescale Type: Yes is set, one of the following is output. P-Value or GSPS: Yes→0 P-Value: No→200
Rescale Slope	(0028,1053)	DS	1C	Rescale slope If Use Rescale Type: Yes is set, one of the following is output. P-Value or GSPS: Yes→1 P-Value: No→7.326007E-1
Rescale Type	(0028,1054)	LO	1C	Rescale type If Use Rescale Type: Yes is set, one of the following is output. P-Value or GSPS: Yes→US P-Value: No→OD

7.4.17 Private Elements

Attribute Name	Tag	VR	Type	Value
Implementor Information (*)	(0019,0010)	LO	1C	Canon Inc. If doUseSrsCnt is 1 in the service engineer setting, this item (Default:Canon Inc.) is output. If 0, the tag itself is not displayed.
Implementor Information	(0019,0016)	LO	1	Canon Inc.
Performed number of series	(0019,1060)	US	3	Series counter
Performed number of images	(0019,1070)	US	3	Image counter
Canon Internal Data1 . . . Canon Internal Data111	(0019,1610) . . . (0019,167F)	OB	3	Canon Internal Data 1 . . . Canon Internal Data 111

7.4.18 SOP Common

Attribute Name	Tag	VR	Type	Value
SOP Class UID	(0008,0016)	UI	1	1.2.840.10008.5.1.4.1.1.1
SOP Instance UID (*)	(0008,0018)	UI	1	1.2.392.200046.100.2.1. (MAC address).(Year, month, day, hour, minute and second) (.(Suffix for GEN/HIS)).(Series No.).(Acquisition No.).(Image No.) (.(Suffix for the storage for each destination)) • After images taken using V6.6 or earlier are updated to V7.0 or later, previous generation rules are applied if data is re-transferred.
Specific Character Set	(0008,0005)	CS	1C	See 6. Support of Extended Character Sets
Instance Creation Date	(0008,0012)	DA	3	(GSPS only output) current date
Instance Creation Time	(0008,0013)	TM	3	(GSPS only output) current time

7.4.19 DX Anatomy Imaged

Attribute Name	Tag	VR	Type	Value
Image Laterality	(0020,0062)	CS	1	(DX only output) Attribute of body part detected. R = right L = left U = unpaired B = both left and right
Anatomic Region Sequence	(0008,2218)	SQ	2	N/A Always tag only output

7.4.20 DX Image

Attribute Name	Tag	VR	Type	Value
Image Type	(0008,0008)	CS	1	ORIGINAL\PRIMARY\ or DERIVED\PRIMARY\
Samples Per Pixel	(0028,0002)	US	1	1
Photometric Interpretation	(0028,0004)	CS	1	MONOCHROME 1 / MONOCHROME 2
Bits Allocated	(0028,0100)	US	1	16
Bits Stored	(0028,0101)	US	1	12
High Bit	(0028,0102)	US	1	11
Pixel Representation	(0028,0103)	US	1	0
Pixel Intensity Relationship	(0028,1040)	CS	1	Always LOG
Pixel Intensity Relationship Sign	(0028,1041)	SS	1	1/–1

Attribute Name	Tag	VR	Type	Value
Rescale Intercept	(0028,1052)	DS	1	Rescale Intercept Use Rescale Type: Yes is set, one of the following is output. P-Value or GSPS: Yes→0 P-Value: No→200
Rescale Slope	(0028,1053)	DS	1	Rescale Slope Use Rescale Type: Yes is set, one of the following is output. P-Value or GSPS: Yes→1 P-Value: No→7.326007E-1
Rescale Type	(0028,1054)	LO	1	Rescale Type Use Rescale Type: Yes is set, one of the following is output. P-Value or GSPS: Yes→US P-Value: No→OD
Presentation LUT Shape	(2050,0020)	CS	1	IDENTITY/INVERSE
Lossy Image Compression	(0028,2110)	CS	1	Has the image been subjected to lossy compression? 00 = Image has NOT been subjected to lossy compression. 01 = Image has been subjected to lossy compression.
Lossy Image Compression Ratio	(0028,2112)	DS	1C	Output when (0028,2110) is 01 Tag itself is not output unless lossy compression is specified.
Patient Orientation	(0020,0020)	CS	1	Patient orientation Example: L\F
Burned In Annotation	(0028,0301)	CS	1	NO
VOI LUT Sequence	(0028,3010)	SQ	1C	Required if Presentation Intent Type (0008,0068) is FOR PRESENTATION and Window Center (0028,1050) is not present. Not required when Window Center (0028,1050) is present.
> LUT Descriptor	(0028,3002)	US or SS	1C	LUT descriptor
> LUT Data	(0028,3006)	US or SS or OW	1C	LUT data
Window Center	(0028,1050)	DS	1C	Window center value (0-4095) Output value varies depending on the service engineer settings.
Window Width	(0028,1051)	DS	1C	Window width value (1-4096) Output value varies depending on the service engineer settings.
Acquisition Device Processing Code	(0018,1401)	LO	3	Acquisition device processing code Outputs the image processing results character string Example: REX312E3,8D*****GSS8,15RZ*M1

7.4.21 DX Detector

Attribute Name	Tag	VR	Type	Value
Detector Type	(0018,7004)	CS	2	SCINTILLATOR
Detector Configuration	(0018,7005)	CS	3	AREA
Detector ID	(0018,700A)	SH	3	The serial number of the detector used to acquire the image.
Field of View Origin	(0018,7030)	DS	1C	Required if Field of View Rotation (0018,7032) or Field of View Horizontal Flip (0018,7034) is present.
Field of View Rotation	(0018,7032)	DS	1C	0, 90, 180, 270 Required if Field of View Horizontal Flip (0018,7034) is present.
Field of View Horizontal Flip	(0018,7034)	CS	1C	Output of field of view horizontal flip NO / YES
Imager Pixel Spacing	(0018,1164)	DS	1	Image receiver pixel spacing (mm) 0.16\0.16 or 0.10\0.10
Pixel Spacing	(0028,0030)	DS	1C	Image receiver pixel spacing (mm) 0: No output for each tag 1: Image pixel size W, H (mm) (Default) Example: 0.160\0.160 2: Images where the pixel size W, H are corrected to the pixel size at the patient side (mm) Correction system is below. Pixel size × Distance between radiation source and patient ÷ Distance between radiation source and detector * If one of the entered values for the distance is 0.0 or less or they are the same, no correction is performed, and output is identical to option 1.

7.4.22 DX Positioning

Attribute Name	Tag	VR	Type	Value
View Position	(0018,5101)	CS	3	View position One of the following: AP, PA, LL, RL, RLD, LLD, RLO, LLO
Distance Source to Patient	(0018,1111)	DS	3	Distance between radiation source and patient (mm) Output to one decimal point
Distance Source to Detector	(0018,1110)	DS	3	Distance between radiation source and detector (mm) Output to one decimal point
Positioner Type	(0018,1508)	CS	2	Tag only always output

7.4.23 X-Ray Acquisition Dose

Attribute Name	Tag	VR	Type	Value
KVP	(0018,0060)	DS	3	Peak tube voltage (kV) from manual input or input from HIS or RIS
Exposure Time	(0018,1150)	IS	3	Exposure time (msec) from manual input or input from HIS or RIS
X-ray Tube Current	(0018,1151)	IS	3	X-ray tube current (mA) from manual input or input from HIS or RIS
Exposure	(0018,1152)	IS	3	Exposure dose (mAs) input from HIS or GEN
Distance Source to Detector	(0018,1110)	DS	3	Distance (mm) between radiation source and detector input from HIS or GEN
Entrance Dose in mGy	(0040,8302)	DS	3	Value received from dosimeter.
Image and Fluoroscopy Area Dose Product	(0018,115E)	DS	3	Value received from dosimeter or manual input
Relative X-ray Exposure	(0018,1110)	DS	3	Relative X-ray exposure dose

7.4.24 X-Ray Generation

Attribute Name	Tag	VR	Type	Value
KVP	(0018,0060)	DS	3	Peak tube voltage (kV) from manual input or input from HIS or RIS
Exposure Time	(0018,1150)	IS	3	Exposure time (msec) from manual input or input from HIS or RIS
X-ray Tube Current	(0018,1151)	IS	3	X-ray tube current (mA) from manual input or input from HIS or RIS
Exposure	(0018,1152)	IS	3	Exposure dose (mAs) input from HIS or GEN
Focal Spot(s)	(0018,1190)	DS	3	Focal size (mm) input from generator Output to one decimal point Example: +100.0 (Be sure to always add +)
Exposure Control Mode	(0018,7060)	CS	3	Exposure control mode One of the following: MANUAL (AEC button display, OFF status) AUTOMATIC (AEC button display, ON status) No output for each tag (AEC button not displayed)
Exposure Control Mode Description	(0018,7062)	LT	3	Exposure control mode description One of the following: C/1 L,C,R/3 C/3 L.,R/3 L/3 R/3 L.,C/3 C,R/3

7.4.25 X-Ray Filtration

Attribute Name	Tag	VR	Type	Value
Filter Type	(0018,1160)	SH	3	Tag only output

7.4.26 Acquisition Context

Attribute Name	Tag	VR	Type	Value
Acquisition Context Sequence	(0040,0555)	SQ	2	N/A If (0008,2218) is output, tag only is output or the tag itself is not output.

7.4.27 X-ray Grid

Attribute Name	Tag	VR	Type	Value
Grid ID	(0018,1006)	LO	3	Actual grid name of the connected sensor unit (output in the service engineer settings)

7.4.28 Presentation LUT

Attribute Name	Tag	VR	Type	Value
Presentation LUT Shape	(2050,0020)	LO	1C	IDENTITY The tag itself is not output unless the printer parameter -Q option designation is made.

7.4.29 Basic Film Session

Attribute Name	Tag	VR	Type	Value
Number of Copies	(2000,0010)	IS	3	Number of copies to be printed for each film of the film session.
Print Priority	(2000,0020)	CS	3	Specifies the priority of the print job. HIGH = High MED = Medium LOW = Low The tag itself is not output unless the printer parameter -y option designation is made.
Medium Type	(2000,0030)	CS	3	Medium Type. (PAPER, CLEAR FILM, BLUE FILM) If CURRENT is selected, the tag itself is not output.
Film Destination	(2000,0040)	CS	3	Film output destination (MAGAZINE, PROCESSOR, BIN_i (i stands for the storage location number)) The tag itself is not output unless the printer parameter -D option designation is made.
Film Session Label	(2000,0050)	LO	3	Human readable label that identifies the film session. The tag itself is not output unless the printer parameter -L option designation is made.

7.4.30 Basic Film Box

Attribute Name	Tag	VR	Type	Value
Image Display Format	(2010,0010)	ST	1	Format specified by the user.
Annotation Display Format ID	(2010,0030)	CS	3	3 annotation display format ID The tag itself is not output unless the printer parameter -N option designation is made.
Film Orientation	(2010,0040)	CS	3	Direction of the film specified by the user. (PORTRAIT or LANDSCAPE) The tag itself is not output unless the printer parameter -O option designation is made.
Film Size ID	(2010,0050)	CS	3	Film size identification. (8INX10IN, 8.5INX11IN, 10INX12IN, 10INX14IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, A3, A4)
Magnification Type	(2010,0060)	CS	3	One of the following interpolation types: REPLICATE BILINEAR CUBIC NONE The tag itself is not output unless the printer parameter -M option designation is made.
Smoothing Type	(2010,0080)	CS	3	Smoothing type (only valid when Magnification Type is CUBIC) The tag itself is not output unless the printer parameter -m option designation is made.
Border Density	(2010,0100)	CS	3	Density of border. (BLACK, WHITE)
Empty Image Density	(2010,0110)	CS	3	Density of image box area on film not including three images The tag itself is not output unless the printer parameter -G option designation is made.
Min Density	(2010,0120)	US	3	Minimum density of the image. The tag itself is not output unless the printer parameter -A option designation is made.
Max Density	(2010,0130)	US	3	Maximum density of the image. The tag itself is not output unless the printer parameter -a option designation is made.
Trim	(2010,0140)	CS	3	Designates if the trim box surrounds the images over the film and prints (ON / OFF) The tag itself is not output unless the printer parameter -t option designation is made.

Attribute Name	Tag	VR	Type	Value
Configuration Information	(2010,0150)	ST	3	Character string that contains either the ID of the printer configuration table that contains a set of values for implementation specific print parameters or one or more configuration data values, encoded as characters. The tag itself is not output unless the printer parameter -S option designation is made.
Illumination	(2010,015E)	US	3	Illumination obtained from diffuse reflection of the existing illumination for the lightbox density and reflectio medium illuminating the transparent film The tag itself is not output unless the printer parameter -Lo option designation is made.
Reflected Ambient Light	(2010,0160)	US	3	Illumination contribution due to reflected ambient light on the transparent film The tag itself is not output unless the printer parameter -La option designation is made.

7.4.31 Basic Image Box

Attribute Name	Tag	VR	Type	Value
Image Position	(2020,0010)	US	1	Position of the image on the film.
Polarity	(2020,0020)	CS	3	Specifies whether minimum pixel values are to be printed black or white. (NORMAL, REVERSE) The tag itself is not output unless the printer parameter -P option designation is made.
Requested Image Size	(2020,0030)	DS	3	Width of the image to be printed, in mm. The tag itself is not output unless a designation is made or, even if a designation was made, if the printer output reduced the image size.
Basic Grayscale Image Sequence	(2020,0110)	SQ	1	Sequence of image.
> Samples Per Pixel	(0028,0002)	US	1	1
> Photometric Interpretation	(0028,0004)	CS	1	MONOCHROME1 or MONOCHROME2
> Rows	(0028,0010)	US	1	Number of vertical pixels in the image data
> Columns	(0028,0011)	US	1	Number of horizontal pixels in the image data
> Bits Allocated	(0028,0100)	US	1	16
> Bits Stored	(0028,0101)	US	1	12
> High Bit	(0028,0102)	US	1	11
> Pixel Representation	(0028,0103)	US	1	0
> Pixel Data	(7FE0,0010)	OW	1C	Pixel sample data making up the image

7.4.32 Printer

Attribute Name	Tag	VR	Type	Value
Printer Status	(2110,0010)	LO	3	Printer device status: NORMAL WARNING FAILURE
Printer Status Info	(2110,0020)	CS	3	Information on printer status.
Printer Name	(2110,0030)	LO	3	User defined identifying the printer.
Manufacturer	(0008,0070)	LO	3	Manufacturer of the printer.
Manufacturer Model Name	(0008,1090)	LO	3	Model name of the printer.
Device Serial Number	(0018,1000)	LO	3	Serial number of the printer.
Software Version	(0018,1020)	LO	3	Software version of the printer.
Date of Last Calibration	(0018,1200)	DA	3	Date (YYYYMMDD) when the last calibration was performed.
Time of Last Calibration	(0018,1201)	TI	3	Time (HHMMSS.000000) when the last calibration was performed.

7.4.33 Presentation Series

Attribute Name	Tag	VR	Type	Value
Modality	(0008,0060)	CS	1	PR

7.4.34 Presentation State Identification

Attribute Name	Tag	VR	Type	Value
Presentation Creation Date	(0070,0082)	DA	1	Sets the current date.
Presentation Creation Time	(0070,0083)	TM	1	Sets the current date.
Instance Number	(0020,0013)	IS	1	1
Presentation Label	(0070,0080)	CS	1	LABEL1
Presentation Description	(0070,0081)	LO	2	Tag only
Presentation Creator’s Name	(0070,0084)	PN	2	Physician’s name (0008,1050) or technologist's name (0008,1070) or tag only

7.4.35 Presentation State Relationship

Attribute Name	Tag	VR	Type	Value
Referenced Series Sequence	(0008,1115)	SQ	1	–
> Series Instance UID	(0020,000E)	UI	1C	Series instance UID
> Referenced Image Sequence	(0008,1140)	SQ	1C	–
>> Referenced SOP Class UID	(0008,1150)	UI	1C	SOP Class UID of CR/DX
>> Referenced SOP Instance UID	(0008,1155)	UI	1C	SOP Instance UID of CR/DX Last saved SOP Instance UID in the case of a retry.
>> Referenced Frame Number	(0008,1160)	IS	1C	1

7.4.36 Displayed Area

Attribute Name	Tag	VR	Type	Value
Displayed Area Selection Sequence	(0070,005A)	SQ	1	–
> Referenced Image Sequence	(0008,1140)	SQ	1C	–
>> Referenced SOP Class UID	(0008,1150)	UI	1C	SOP Class UID
>> Referenced SOP Instance UID	(0008,1155)	UI	1C	SOP Instance UID
>> Referenced Frame Number	(0008,1160)	UI	1C	1
> Displayed Area Top Left Hand Corner	(0070,0052)	SL	1	1\1
> Displayed Area Bottom Right Hand Corner	(0070,0053)	SL	1	(0028,0011)\(0028,0010)
> Presentation Size Mode	(0070,0100)	CS	1	Presentation size selection method SCALE TO FIT TRUE SIZE
> Presentation Pixel Spacing	(0070,0101)	DS	1C	Same value as (0018,1164) Example: 0.16\0.16

7.4.37 Softcopy VOI LUT

Attribute Name	Tag	VR	Type	Value
Softcopy VOI LUT Sequence	(0028,3110)	SQ	1	–
> Referenced Image Sequence	(0008,1140)	SQ	1C	–
>> Referenced SOP Class UID	(0008,1150)	UI	1C	SOP Class UID of CR/DX
>> Referenced SOP Instance UID	(0008,1155)	UI	1C	SOP Instance UID of CR/DX
>> Referenced Frame Number	(0008,1160)	IS	1C	1
> Window Center	(0028,1050)	DS	1C	Window center value (0-4095) Output value varies depending on the service engineer settings. Fixed to “2048” when no value is set.
> Window Width	(0028,1051)	DS	1C	Window width value (1-4096) Output value varies depending on the service engineer settings. Fixed to “4096” when no value is set.

7.4.38 Softcopy Presentation LUT

Attribute Name	Tag	VR	Type	Value
Presentation LUT Shape	(2050,0020)	CS	1C	IDENTITY or INVERSE

7.4.39 Storage Commitment (Option)

Storage Commitment Request: N-ACTION

Attribute Name	Tag	VR	Type	Value
Transaction UID	(0008,1195)	UI	1	ID that identifies storage commitment request “1.2.392.200046.100.2.NN.MAC address.YYYYMMDDHHMMSS.1” is the format. 1.2.392.200046.100.2: Standard ID NN: Internal ID counted sequentially beginning from 1. This count is incremented each time there is a storage commitment request. MAC address: Up to 15 digits YYYYMMDDHHMMSS: Year, month, day, time of issue of storage commitment request. 1: Standard ID

Attribute Name	Tag	VR	Type	Value
Referenced SOP Sequence	(0008,1199)	SQ	1	–
> Referenced SOP Class UID	(0008,1150)	UI	1	SOP Class UID of an image or GSPS object that needs a storage commitment request.
> Referenced SOP Instance UID	(0008,1155)	UI	1	SOP Instance UID of an image or GSPS object that needs a storage commitment request.

Results of Storage Commitment Request: N-EVENT-REPORT (Success)

Attribute Name	Tag	VR	Type	Value
Transaction UID	(0008,1195)	UI	1	Transaction UID sent with N-ACTION
Referenced SOP Sequence	(0008,1199)	SQ	1	–
> Referenced SOP Class UID	(0008,1150)	UI	1	SOP Class UID of a successful image or GSPS object storage.
> Referenced SOP Instance UID	(0008,1155)	UI	1	SOP Instance UID of a successful image or GSPS object storage.

Results of Storage Commitment Request: N-EVENT-REPORT (Failure)

Attribute Name	Tag	VR	Type	Value
Transaction UID	(0008,1195)	UI	1	Transaction UID sent with N-ACTION
Referenced SOP Sequence	(0008,1199)	SQ	1C	(Necessary when successful images storage exist)
> Referenced SOP Class UID	(0008,1150)	UI	1	SOP Class UID of a successful image or GSPS object storage.
> Referenced SOP Instance UID	(0008,1155)	UI	1	SOP Instance UID of a successful image or GSPS object storage.
Failed SOP Sequence	(0008,1198)	SQ	1	–
> Referenced SOP Class UID	(0008,1150)	UI	1	SOP Class UID of failed image or GSPS object storage.
> Referenced SOP Instance UID	(0008,1155)	UI	1	SOP Instance UID of failed image or GSPS object storage.
> Failure Reason	(0008,1197)	US	1	Error codes and storage commitment request failure descriptions. See the table below.

Error Code	Description
0x0110	General failure encountered in processing.
0x0112	One or more elements were acquired in referenced SOP instance sequence.
0x0213	SCP does not have resources at the moment enough to store SOP instance by request.

Error Code	Description
0x0122	Referenced SOP Class is not supported. Storage commitment request was issued to an SOP instance whose SOP Class was not supported by SCP.
0x0119	As an element in the referenced SOP instance sequence, the SOP Class is not compatible with the SOP Class registered for this SOP instance in SCP.
0x0131	A storage commitment request processing ID has already been used.

7.4.40 File Meta Information

External storage media storing

Attribute Name	Tag	VR	Type	Value
File Meta Infomation Version	(0002,0001)	OB	–	File Meta Information Version 0x100 is always output.
Media Storage SOP Class UID	(0002,0002)	UI	–	Media Storage SOP Class UID 1.2.840.10008.5.1.4.1.1.1 is always output.
Media Storage SOP Instance UID	(0002,0003)	UI	–	Media Storage SOP Instance UID
Transfer Syntax UID	(0002,0010)	UI	–	Transfer Syntax UID 1.2.840.10008.1.2.4.70 (LOSSLESS)
Implementation Class UID	(0002,0012)	UI	–	Implementation Class UID 1.2.392.200046.100.2.xxxxx (version number of CXDI sensor unit) is always output
Implementation Version Name	(0002,0013)	SH	–	Implementation Version Name Example: CANON CXDI xxxxx (version number of CXDI sensor unit)

7.4.41 DICOMDIR

Attribute Name	Tag	VR	Type	Value
File Meta Infomation Version	(0002,0001)	OB	–	File meta information version 0x100 is always output.
Media Storage SOP Class UID	(0002,0002)	UI	–	Media storage SOP Class UID 1.2.840.10008.1.3.10 (Media Storage Directory Storage) is always output.
Media Storage SOP Instance UID	(0002,0003)	UI	–	Media Storage SOP Instance UID Identical with the SOP Instance UID (0008,0018) of the image associated with DICOMDIR.
Transfer Syntax UID	(0002,0010)	UI	–	Transfer Syntax UID Always 1.2.840.10008.1.2.1 (Explicit VR Little Endian)

Attribute Name	Tag	VR	Type	Value
Implementation Class UID	(0002,0012)	UI	–	Implementation Class UID 1.2.392.200046.100.2.xxxxx (version number of CXDI sensor unit) is always output
Implementation Version Name	(0002,0013)	SH	–	Implementation Version Name Example: CANON CXDI xxxxx (version number of CXDI sensor unit)

7.4.42 File-Set Identification

DICOMDIR

Attribute Name	Tag	VR	Type	Value
File-Set ID	(0004,1130)	CS	2	CANON_CXDI_DIR

7.4.43 Directory Information

DICOMDIR

Attribute Name	Tag	VR	Type	Value
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	UL	1	Offset value of the first Patient Directory Record
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	UL	1	Offset value of the last Patient Directory Record
File-set Consistency Flag	(0004,1212)	US	1	0000H: No given conflict or FFFFH: FSR or FSU grants that any conflicts exist.
Directory Record Sequence	(0004,1220)	SQ	2	0 or more repetitive sequences including directory elements from (0004,1400) to (0004,1512) and Specific Directory Records. By specifying "FFFFFFFF" for this value and "FFFEE0DDH" for the last sequence, length specification is not necessary.
Offset of the Next Directory Record	(0004,1400)	UL	1	Offset of the next directory record. “0” is output when no record is in the next directory.
Record In-use Flag	(0004,1410)	US	1	FFFFH: Active or 0000H: Inactive
Offset of Referenced Lower-Level Directory Entity	(0004,1420)	UL	1	Offset of Referenced Lower-Level Directory Entity. “0” is output when Directory Record Type is IMAGE.

Attribute Name	Tag	VR	Type	Value
Directory Record Type	(0004,1430)	CS	1	One of the following is output. PATIENT, STUDY, SERIES, IMAGE
The following tags are only in the Image Directory Record.				
Referenced File ID	(0004,1500)	CS	1C	Image file repository that the directory record refers to. Example: AAA\BBB\IMG001 7 hierarchy (max.) and 8 characters (max.) for each directory are available.
Referenced SOP Class UID in File	(0004,1510)	UI	1C	SOP Class UID of an image file the directory record refers to.
Referenced SOP Instance UID in File	(0004,1511)	UI	1C	SOP Instance UID of an image file the directory record refers to.
Referenced Transfer Syntax UID in File	(0004,1512)	UI	1C	Transfer Syntax of an image file the directory record refers to.

7.5 DICOMDIR File

7.5.1 Basic Directory IOD Information Model

Directory Record Type	Reference	Directory Record Types which may be included in the next lower-level directory Entity
(Root Directory Entitiy)	–	Patient
Patient	7.4.4	Study
Study	7.4.5–7.4.6	Series
Series	7.4.7–7.4.9	Image
Image	7.4.11, 7.4.14, 7.4.20	–

7.5.2 Definition of Specific Directory Records

7.5.2.1 Patient Keys

Key	Tag	VR	TYPE	Value
Specific Character Set	(0008,0005)	CS	1C	Necessary when an extended or substitute character set is used in the key.
Patient's Name	(0010,0010)	PN	2	Patient’s name being entered.
Patient ID	(0010,0020)	LO	1	Patient’s ID being entered.
Patient's Birth Date	(0010,0030)	DA	3	Patient’s birth date (YYYYMMDD) being entered.

Key	Tag	VR	TYPE	Value
Patient's Sex	(0010,0040)	CS	3	Patient’s sex One of the following is output. M, F, O
Other Patient IDs	(0010,1000)	LO	3	Other patient IDs

7.5.2.2 Study Keys

Key	Tag	VR	TYPE	Value
Specific Character Set	(0008,0005)	CS	1C	Necessary when an extended or substitute character set is used in the key.
Study Date	(0008,0020)	DA	2	Date (YYYYMMDD) when study was performed.
Study Time	(0008,0030)	TM	2	Time (HHMMSS.000000) when study was performed.
Accession Number	(0008,0050)	SH	2	RIS or HIS generated number that identifies the order for the study.
Referring Physician's Name	(0008,0090)	PN	2	Physician’s name to refer to. (Physician in charge of the patient)
Study Description	(0008,1030)	LO	2	Description of the study performed.
Study Instance UID	(0020,000D)	UI	1C	1.2.392.200046.100.2.1. (MAC address).(Year, month, day, hour, minute and second) (.(Suffix for GEN/HIS))
Study ID	(0020,0010)	SH	1	Internal study number

7.5.2.3 Series Keys

Key	Tag	VR	TYPE	Value
Specific Character Set	(0008,0005)	CS	1C	Necessary when an extended or substitute character set is used in the key.
Modality	(0008,0060)	CS	1	CR or DX
Series Instance UID	(0020,000E)	UI	1	1. 2. 392. 200046. 100. 2. 1. (MAC address).(Year, month, day, hour, minute and second) (.(Suffix for GEN/HIS)). (Sequential series No.)
Series Number	(0020,0011)	IS	2	Sequential series number
Body Part Examined	(0018,0015)	CS	3	One of the following is output. SKULL, CSPINE, TSPINE, LSPINE, SSPINE, COCCYX, CHEST, CLAVICLE, BREAST, ABDOMEN, PELVIS, HIP, SHOULDER, ELBOW, KNEE, ANKLE, HAND, FOOT, EXTREMITY, HEAD, HEART, NECK, LEG, ARM, JAW
Institution Name	(0008,0080)	LO	3	Institution where the equipment is located.
Institution Address	(0080,0081)	ST	3	Tag only
Series Description	(0008,103E)	LO	3	User provided description of the series.
Performing Physician's Name	(0008,1050)	PN	3	Tag only

7.5.2.4 Image Keys

Key	Tag	VR	TYPE	Value
Specific Character Set	(0008,0005)	CS	1C	Necessary when an extended or substitute character set is used in the key.
Instance Number	(0020,0013)	IS	1	1
Rows	(0028,0010)	US	3	Number of pixels in vertical direction of image data.
Columns	(0028,0011)	US	3	Number of pixels in horizontal direction of image data.

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