No. MIINM0009EA

CONFORMANCE STATEMENT

FOR NUCLEAR MEDICINE EQUIPMENT

GCA SOFTWARE

FOR

DICOM TRANSFER SOFTWARE

(FOR QUERY/RETRIEVE SCU, STORAGE SCP)

MODEL NSDQ-055A, NSDP-055A

(MIINM0009EA)

IMPORTANT!

(1) No part of this manual may be copied or reprinted, in whole or in part, without written permission.

(2) The contents of this manual are subject to change without prior notice and without our legal obligation.

*

Table of Contents

1 Introduction

This document is a DICOM Conformance Statement for Toshiba's Nuclear Medicine System, and the applicable models covered by this document are described in Table 8. It is intended to provide the reader with the knowledge of how to integrate this product within a DICOM compliant hospital network. It details the DICOM Service Classes, Information Objects, and Communication Protocols that are supported by this product.

If the reader is unfamiliar with DICOM, it is recommended that they read the DICOM Specification (referenced below) prior to reading this conformance statement. Also note that this document is formatted according to the DICOM Specification, Part 2: Conformance.

1.1 References

- ACR-NEMA Digital Imaging and Communications in Medicine, DICOM V3.0.

1.2 Definitions

- **Association Establishment** - An Association Establishment is the first phase of communication between two DICOM Application Entities. The AEs use the Association Establishment to negotiate how data will be encoded and the type of data to be exchanged.
- **Called Application Entity Title** - The Called AE Title defines the intended receiver of an Association.
- **Calling Application Entity Title** - The Calling AE Title defines the requestor of an Association.
- **DICOM Message Service Element (DIMSE)** - A DIMSE defines the services and protocols utilized by an Application Entity to exchange messages.
- **Information Object Definition (IOD)** - An IOD is a data model which is an abstraction of real-world information. This data model defines the nature and attributes relevant to the class of real-world objects represented.
- **Service Class Provider (SCP)** - A Service Class Provider plays the "server" role to perform operations and invoke notifications during an Association. An example of a Storage Service Class Provider would be an image storage device. In this case, the image storage device is storing the image that was sent by a Service Class User.
- **Service Class User (SCU)** - A Service Class User plays the "client" role to invoke operations and perform notifications during an Association. An example of a Storage Service Class User would be an image acquisition device. In this case, the image acquisition device will create and send a DICOM image by requesting that a Service Class Provider store that image.
- **Service/Object Pair (SOP) Class** - The union of an Information Object Definition and a set of DIMSE Services define a SOP Class. A DICOM Application Entity may support one or more SOP Classes. A unique SOP Class UID defines each SOP Class.
- **SOP Instance** - A specific occurrence of an Information Object.
- **Transfer Syntax** - The Transfer Syntax is a set of encoding rules that allow DICOM Application Entities to negotiate the encoding techniques (e.g., data element structure, byte ordering, compression) they are able to support. The Transfer Syntax is negotiated during Association Negotiation.
- **Unique Identifier (UID)** - A Unique Identifier is a globally unique, ISO compliant, ASCII-numeric string. It guarantees uniqueness across multiple countries, sites, vendors and equipment.

1.3 Acronyms, Abbreviations and Symbols

- ACC American College of Cardiology
- ACR American College of Radiology
- ASCII American Standard Code for Information Interchange
- AE Application Entity
- ANSI American National Standards Institute
- CEN TC251 Comite Europeen de Normalisation - Technical Committee 251 - Medical Informatics
- DICOM Digital Imaging and Communications in Medicine
- DIMSE DICOM Message Service Element
- DIMSE-C DICOM Message Service Element - Composite
- DIMSE-N DICOM Message Service Element - Normalized
- HIS Hospital Information System
- HL7 Health Level 7
- IE Information Entity
- IOD Information Object Definition
- ISO International Standards Organization
- JIRA Japan Industries Association of Radiological Systems
- NEMA National Electrical Manufacturers Association
- OSI Open Systems Interconnection
- 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

2 Implementation Model

2.1 Application Data Flow Diagram

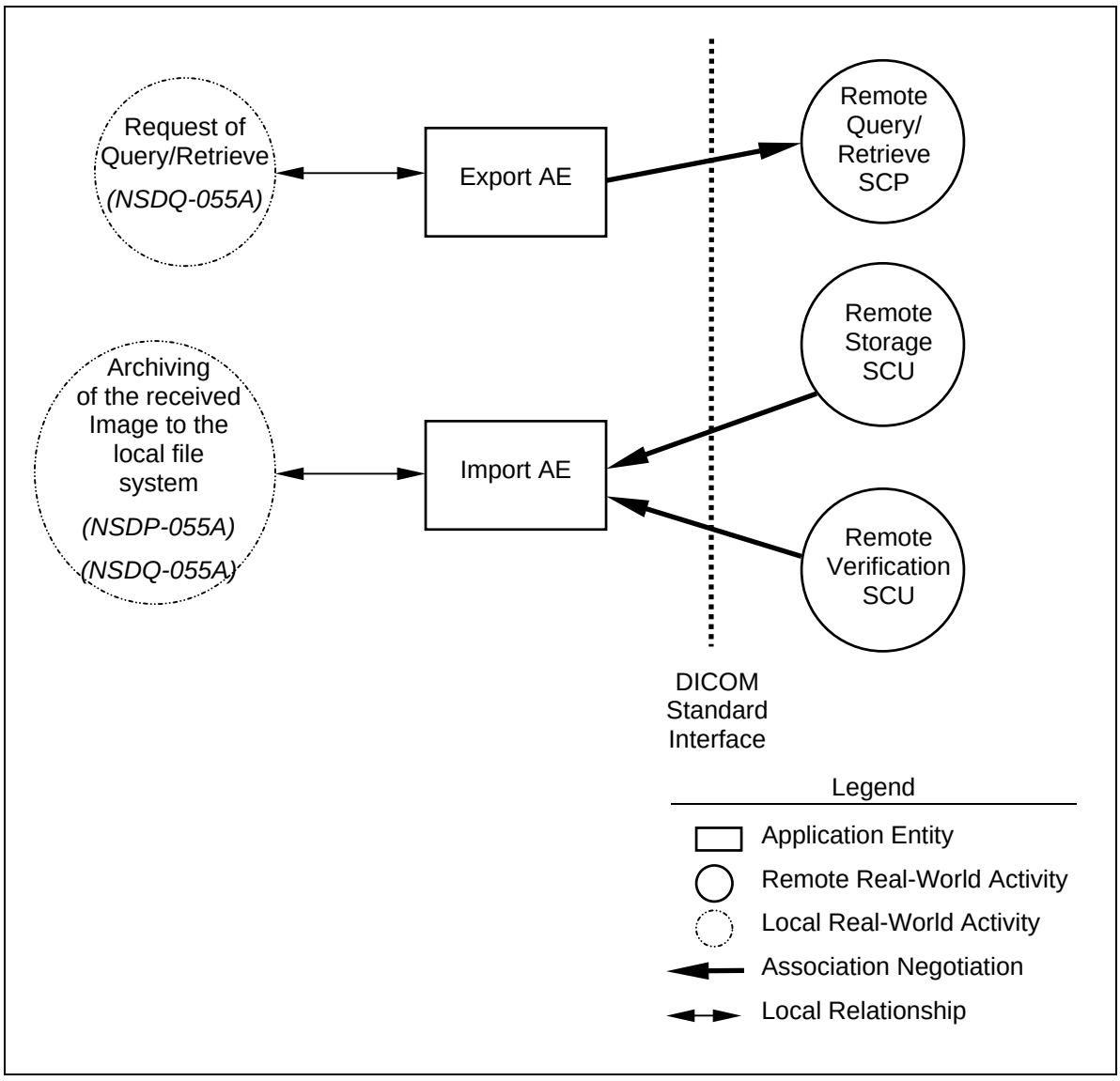

Figure 1

2.2 Functional Definitions of AE's

2.2.1 Export AE

Export AE is used to transmit Query and Retrieve requests to a remote DICOM device.

2.2.2 Import AE

Import AE is used to respond to requests to verify that the NM System is present and active on the network and to receive CT, MR, and NM images from remote DICOM devices.

2.3 Sequencing of Real World Activities

2.3.1 Features

2.3.1.1 Request of Query/Retrieve

- Operator can obtain search lists using the patient name, patient ID and/or the examination date as the search key.
- Operator requests to retrieve images after selecting the images to be transferred from the Patient List, the Study List or the Series List.
- When the transfer request fails, the error message is displayed, and it is possible to choose whether to abort the request or to continue.

2.3.1.2 Archiving of the Received Image to the Local File System

- The NM System receives CT, MR and NM images from remote DICOM devices.
- The NM System archives the received images to the local file system.

2.3.2 Operation

2.3.2.1 Request of Query/Retrieve

The operation for a search request and an image transfer request is described below:

Step-1: Select the remote Query/Retrieve SCP for image transfer.

Step-2: Enter the information, patient name, patient ID and/or examination date for the items for which the operator wishes to search.

Step-3: Select the patients, the studies or the series to be transferred.

Step-4: Request transfer.

2.3.2.2 Archiving of the Received Image to the Local File System

There is no specific operation for receiving and archiving images.

3 AE Specifications

3.1 Export Specification

Export AE provides Standard Conformance to the following DICOM SCP Classes as an SCU:

Table 1

SOP Class Name	SOP Class UID
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
Study Root Query/Retrieve Information Model-Find	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model-Move	1.2.840.10008.5.1.4.1.2.2.2
Patient /Study Only Query/Retrieve Information Model-Find	1.2.840.10008.5.1.4.1.2.3.1
Patient /Study Only Query/Retrieve Information Model-Move	1.2.840.10008.5.1.4.1.2.3.2

3.1.1 Export Association Establishment Policies

3.1.1.1 Export General

Export AE will utilize and understand the following Application Context Name:

Table 2

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1

Export AE supports a minimum PDU size of 16Kbytes and a maximum PDU size of 16Kbytes. The default value is set to 16Kbytes.

3.1.1.2 Export Number of Associations

Export AE can only establish one association at a time, independent of the number of destinations chosen.

3.1.1.3 Export Asynchronous Nature

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

3.1.1.4 Export Implementation Identifying Information

Export AE will specify the following Implementation Identifying Information:

Table 3

Applicable Models	Implementation Class UID	Implementation Version Name
GMS-5500A/UI, GCA-7100A/UI, GCA-7200A/UI, GCA-9300A/PI, GMS-5500A/PI, GCA-7100A/PI, GCA-7200A/PI, GCA-9300A/PI	1.2.392.200036.9116.5.3.10	“TM_NM_DCM_V1.0”
GMS-5500A/DI, GCA-7100A/DI, GCA-7200A/DI, GCA-9300A/DI	1.2.392.200036.9116.5.1.10	“TM_NM_DCM_V1.0”

3.1.2 Export Association Initiation by Real-World Activity

Export AE initiates an association when the following activities is chosen by the operator:

- “Request of Query/Retrieve”
  - Query/Retrieve(Find) - Get data lists from a remote DICOM device
  - Query/Retrieve(Move) - Send data transfer request to a remote device

3.1.2.1 Export Real-World Activity - Query/Retrieve(Find)

3.1.2.1.1 Export Associated Real-World Activity -Query/Retrieve(Find)

Query/Retrieve (Find) is executed by the NM System when the operator requests to see the Patient, Study or Series list of a remote DICOM device.

3.1.2.1.2 Export Proposed Presentation Contexts -Query/Retrieve(Find)

Export AE proposes the following Presentation Contexts shown below:

Table 4

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Patient root Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study root Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Patient /Study Only Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.1.2.1 Export SOP Specific Conformance - Query/Retrieve(Find)

Export AE operation involves the following sequence of steps for each search request:

(1) Association establishment (requestor only)

(2) Query Request (SCU only)

(3) Association release (requestor only)

Export AE judges that query request succeeded when the result of (2) “Query Request” is “Success” even if the result of (3) “Association release” is “Failure”.

Search keys for the Query/Retrieve SCU are described in Chapter 9.

3.1.2.2 Export Real-World Activity - Query/Retrieve(MOVE)

3.1.2.2.1 Export Associated Real-World Activity -Query/Retrieve(Move)

Query/Retrieve (Move) is executed by the NM System after the operator’s image transfer requests are queued.

3.1.2.2.2 Export Proposed Presentation Contexts -Query/Retrieve(Move)

Export AE proposes the following Presentation Contexts shown below:

Table 5

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			**Extended**
Name	**UID**	**Name List**	**UID List**	**Role**	**Negotiation**
Patient root Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study root Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Patient Study Only Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.2.2.1 Export SOP Specific Conformance - Query/Retrieve(Move)

Export AE operation involves the following sequence of steps for each image transfer.

(1) Association establishment (requestor only)

(2) Retrieve(image transfer) Request (SCU only)

(3) Association release (requestor only)

Export AE judges that the transfer of one image succeeded when the result of (2) “Retrieve Request” is “Success” even if the result of (3) “Association release” is “Failure”.

3.1.3 Export Association Acceptance Policy

Export AE does not accept any associations generated by remote applications.

3.2 Import Specification

Import AE provides Standard Conformance to the following DICOM SOP Classes as an SCP:

Table 6

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
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
NM Image Storage	1.2.840.10008.5.1.4.1.1.20

3.2.1 Import Association Establishment Policies

3.2.1.1 Import General

Import AE will utilize and understand the following Application Context Name:

Table 7

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1

Import AE supports a minimum PDU size of 16Kbytes and a maximum PDU size of 16Kbytes. The default value is set to 16Kbytes.

3.2.1.2 Import Number of Associations

Import AE supports up to three associations at a time.

3.2.1.3 Import Asynchronous Nature

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

3.2.1.4 Import Implementation Identifying Information

Import AE will specify the following Implementation Identifying Information:

Table 8

Applicable Models	Implementation Class UID	Implementation Version Name
GMS-5500A/UI, GCA-7100A/UI, GCA-7200A/UI, GCA-9300A/PI, GMS-5500A/PI, GCA-7100A/PI, GCA-7200A/PI, GCA-9300A/PI	1.2.392.200036.9116.5.3.10	“TM_NM_DCM_V1.0”
GMS-5500A/DI, GCA-7100A/DI, GCA-7200A/DI, GCA-9300A/DI	1.2.392.200036.9116.5.1.10	“TM_NM_DCM_V1.0”

3.2.2 Import Association Initiation by Real-World Activity

Import AE never initiates an association.

3.2.3 Import Association Acceptance Policy

When Import AE receives an association request, it will allow the following activities to be performed during that association:

- Verification - Allow a remote DICOM device to verify that the NM System is active on the DICOM network
- Storage - Allow a remote DICOM device to send a CT, MR or NM image to the NM System

3.2.3.1 Import Real-World Activity – Verification

3.2.3.1.1 Import Associated Real-World Activity – Verification

The NM System responds to Verification made by a remote Verification SCU.

3.2.3.1.2 Import Presentation Context Table – Verification

Import AE accepts all of the Presentation Contexts shown below:

Table 9

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			**Extended**
Name	**UID**	**Name List**	**UID List**	**Role**	**Negotiation**
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

3.2.3.1.2.1 Import SOP Specific Conformance – Verification

Import AE responds with the following status codes in response to a C-ECHO request.

Table 10

Service Status	Further Meaning	Protocol Codes	Description
Success	Success	0x0000	Operation performed properly

3.2.3.1.3 Import Presentation Context Acceptance Criterion – Verification

Import AE accepts the Presentation Contexts listed in the Presentation Context Table (Table 9).

3.2.3.1.4 Import Transfer Syntax Selection Policies – Verification

Import AE supports only the Implicit VR Little Endian transfer syntax. It rejects any proposed Presentation Context that does not specify the default Implicit VR Little Endian transfer syntax.

3.2.3.2 Import Real-World Activity – Storage

3.2.3.2.1 Import Associated Real-World Activity – Storage

The NM System receives image data sent by a remote Storage SCU, archives it to the local file system, and responds to the remote Storage SCU.

3.2.3.2.2 Import Presentation Context Table – Storage

Import AE accepts all of the Presentation Contexts shown below:

Table 11

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			**Extended**
Name	**UID**	**Name List**	**UID List**	**Role**	**Negotiation**
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

3.2.3.2.2.1 Import SOP Specific Conformance – Storage

Import AE responds with the following status codes in response to a C-STORE request.

Table 12

Service Status	Further Meaning	Status Codes	Description
Success	Success	0x0000	Operation was performed properly
Error	Data Set does not match SOP Class	0xA900	SOP Class UID does not match.
	Cannot understand	0xC000	Data set was invalid, or unsupported extended character set was received. (see Chapter 7 ‘Support of Extended Character Sets’)
Refused	Out of Resources	0xA700	Local resource is insufficient.

When the service status response is “Refused”, check the NM System for one of the following situations:

1) System is out of free local storage space.
2) System has busy processes/applications that are draining CPU resources.

Import AE is Level 0 Conformance as described in Part 4 of the DICOM V3.0 Standard document. The attributes to be stored are defined in Chapter 8 ‘Information Object Definition – Storage SCP’.

CT, MR and NM Information Object Definitions are described in Chapter 8.

3.2.3.2.3 Import Presentation Context Acceptance Criterion – Storage

Import AE accepts the Presentation Contexts listed in the Presentation Context Table (Table 11).

3.2.3.2.4 Import Transfer Syntax Selection Policies – Storage

Import AE accepts the Transfer Syntax listed in the Presentation Context Table (Table 11).
The selection priority of acceptable Transfer Syntax is the Default Transfer Syntax. See 6.4.1.

4 Communication Profiles

4.1 Supported Communication Stacks

This product provides DICOM TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.2 OSI Stack

Not applicable to this product.

4.3 TCP/IP Stack

This product inherits its TCP/IP stack from the computer system upon which it executes.

4.3.1 API

Not applicable to this product.

4.3.2 Physical Media Support

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

4.4 Point-to-Point Stack

Not applicable to this product.

5 Extensions/Specializations/Privatizations

Not applicable to this product.

6 Configuration

For the NM System, the configuration procedure is described in the installation manual.

Note: Settings and changes are to be performed by Toshiba Service Personnel at the time of installation of the system and at anytime thereafter.

6.1 AE Title/Presentation Address Mapping

The mapping from the AE titles to the presentation addresses is as follows:

- One port number and one AE title can be described for one host name.
- Each AE title is mapped to one port number.
- Up to fifteen remote hosts can be described.
- The NM System has the following default values:

Local Port No.	104
Local AE Title	“TM_NM_DCM_V1.0”

6.2 Configurable Parameters

6.2.1 Time-out Value, Retry Count, Retry Interval

The time-out value, retry count, and retry interval in each status are shown below.

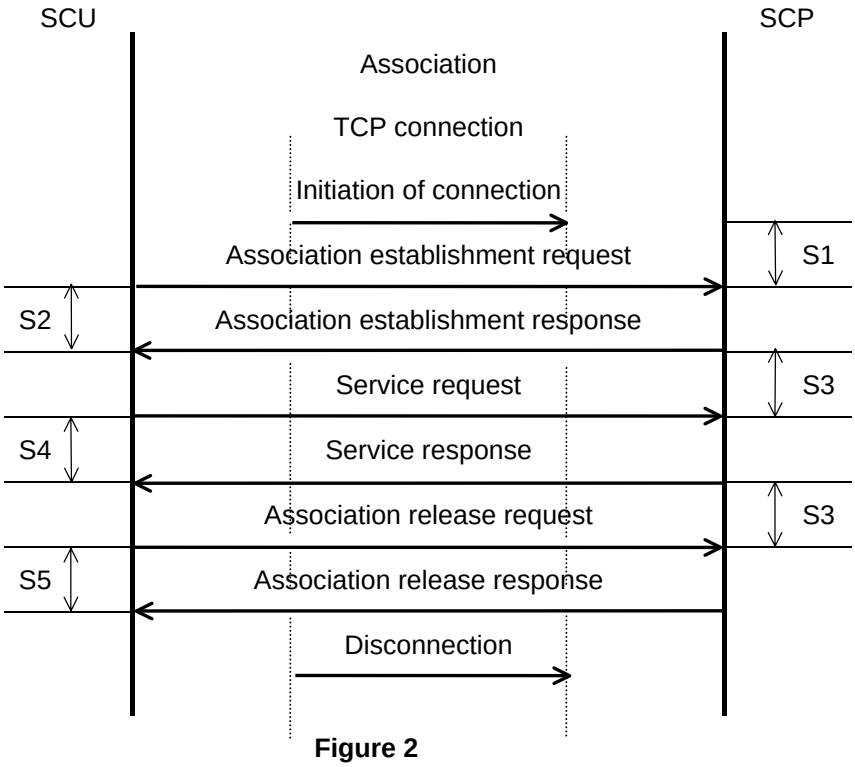

Figure 2

Table 13

Status	Item	Time-out value	Retry count	Retry interval	Remarks
S1	Association establishment request waiting time	Default: 60 seconds Range: 1 to 999999	Not set	Not set	Only one parameter can be set in the NM System.
S2	Association establishment response waiting time	Default: 30 seconds Range: 1 to 999999	Default: Once Range: 0 to 999999	Default: 30 seconds Range: 0 to 999999	Only one parameter can be set in the NM System.
S3	Service request waiting time	Default: 60 seconds Range: 1 to 999999	Not set	Not set	Only one parameter can be set in the NM System.
S4	Service response waiting time	Default: 180 seconds Range: 1 to 999999	Not set	Not set	Can be set for each provided service
S5	Association release waiting time	Default: 5 seconds Range: 1 to 999999	Not set	Not set	Only one parameter can be set in the NM System.

6.3 Implementation Information and Maximum Reception PDU Size

The default values for the NM System for the Implementation Class UID, the Implementation Version name, and the Maximum length received are as follows. They cannot be changed.

Table 14

Applicable Models	Implementation Class UID	Implementation Version Name	Maximum length received (unit: byte)
GMS-5500A/UI, GCA-7100A/UI, GCA-7200A/UI, GCA-9300A/PI, GMS-5500A/PI, GCA-7100A/PI, GCA-7200A/PI, GCA-9300A/PI	1.2.392.200036.9116.5.3.10	“TM_NM_DCM_V1.0”	0x4000
GMS-5500A/DI, GCA-7100A/DI, GCA-7200A/DI, GCA-9300A/DI	1.2.392.200036.9116.5.1.10	“TM_NM_DCM_V1.0”	0x4000

6.4 Default Transfer Syntax

6.4.1 Export AE

The NM System can accept only the following Transfer Syntax:

" Implicit VR Little Endian "

6.4.2 Import AE

The NM System can accept only the following Transfer Syntax:

" Implicit VR Little Endian "

7 Support of Extended Character Sets

This product supports the following character sets:

- ISO-IR 6 (default) Basic G0 Set

If Import AE receives image data that contains characters from an unsupported character set, Import AE will respond with “Cannot understand” to the C-STORE request. (See 3.2.3.2.2.1)

8 Information Object Definition - Storage SCP

8.1 Entity Module Definitions

The information modules for the NM System Storage SCP are defined below.

8.1.1 CT IOD Modules

Table 15

Information Entity	Module	Reference	Usage[1]
Patient	Patient Module	8.2.1	M
Study	General Study Module	8.2.2	M
	Patient Study Module	8.2.3	U
Series	General Series Module	8.2.4	M
Frame of Reference	Frame of Reference Module	8.2.5	M
Equipment	General Equipment Module	8.2.6	M
Image	General Image Module	8.2.7	M
	Image Plane Module	8.2.8	M
	Image Pixel Module	8.2.9	M
	Contrast/Bolus Module	8.2.10	C
	VOI LUT Module	8.2.11	U
	SOP Common Module	8.2.12	M
	CT Image Module	8.2.13	M

[1] M = Mandatory, C = Conditional, U = User option

8.1.2 MR IOD Modules

Table 16

Information Entity	Module	Reference	Usage[1]
Patient	Patient Module	8.2.1	M
Study	General Study Module	8.2.2	M
	Patient Study Module	8.2.3	U
Series	General Series Module	8.2.4	M
Frame of Reference	Frame of Reference Module	8.2.5	M
Equipment	General Equipment Module	8.2.6	M
Image	General Image Module	8.2.7	M
	Image Plane Module	8.2.8	M
	Image Pixel Module	8.2.9	M
	Contrast/Bolus Module	8.2.10	C
	VOI LUT Module	8.2.11	U
	SOP Common Module	8.2.12	M
	MR Image Module	8.2.14	M

[1] M = Mandatory, C = Conditional, U = User option

8.1.3 NM IOD Modules

The NM System can receive data from its own system that contains following private tags:

Table 17

Attribute Name	Tag	Attribute Description
Private Creator	(7017,00XX)	“TOSHIBA_MEC_NM3”
Black box data 1	(7017,XX00)	
Black box data 2	(7017,XX01)	

For details on the non-private tags, refer to the DICOM Image Storage SCU Conformance Statement for the NM System (MIINM0008EA).

8.2 Information Object Definitions

8.2.1 Patient Module

Table 18

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	
Patient ID	(0010,0020)	2	
Patient's Birth Date	(0010,0030)	2	
Patient's Sex	(0010,0040)	2	
Other Patient IDs	(0010,1000)	3	
Other Patient Names	(0010,1001)	3	
Patient Comments	(0010,4000)	3	

8.2.2 General Study Module

Table 19

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	
Study Date	(0008,0020)	2	
Study Time	(0008,0030)	2	
Referring Physician's Name	(0008,0090)	2	
Study ID	(0020,0010)	2	
Accession Number	(0008,0050)	2	
Study Description	(0008,1030)	3	
Name of Physician(s) Reading Study	(0008,1060)	3	

8.2.3 Patient Study Module

Table 20

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnoses Description	(0008,1080)	3	
Patient’s Age	(0010,1010)	3	
Patient’s Size	(0010,1020)	3	
Patient’s Weight	(0010,1030)	3	

8.2.4 General Series Module

Table 21

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	2	
Laterality	(0020,0060)	2C	
Series Date	(0008,0021)	3	
Series Time	(0008,0031)	3	
Performing Physicians' Name	(0008,1050)	3	
Protocol Name	(0018,1030)	3	
Body Part Examined	(0018,0015)	3	
Patient Position	(0018,5100)	2C	

8.2.5 Frame of Reference Module

Table 22

Attribute Name	Tag	Type	Attribute Description
Frame of Reference UID	(0020,0052)	1	
Position Reference Indicator	(0020,1040)	2	

8.2.6 General Equipment Module

Table 23

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	
Institution Name	(0008,0080)	3	
Station Name	(0008,1010)	3	
Institutional Department Name	(0008,1040)	3	
Manufacturer's Model Name	(0008,1090)	3	
Device Serial Number	(0018,1000)	3	
Software Versions	(0018,1020)	3	
Spatial Resolution	(0018,1050)	3	
Date of Last Calibration	(0018,1200)	3	
Time of Last Calibration	(0018,1201)	3	

8.2.7 General Image Module

Table 24

Attribute Name	Tag	Type	Attribute Description
Image Number	(0020,0013)	2	
Patient Orientation	(0020,0020)	2C	
Image Date	(0008,0023)	2C	
Image Time	(0008,0033)	2C	
Image Type	(0008,0008)	3	
Acquisition Number	(0020,0012)	3	
Acquisition Date	(0008,0022)	3	
Acquisition Time	(0008,0032)	3	
Images in Acquisition	(0020,1002)	3	
Image Comments	(0020,4000)	3	

8.2.8 Image Plane Module

Table 25

Attribute Name	Tag	Type	Attribute Description
Pixel Spacing	(0028,0030)	1	
Image Orientation (Patient)	(0020,0037)	1	
Image Position (Patient)	(0020,0032)	1	
Slice Thickness	(0018,0050)	2	
Slice Location	(0020,1041)	3	

8.2.9 Image Pixel Module

Table 26

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	
Photometric Interpretation	(0028,0004)	1	
Rows	(0028,0010)	1	
Columns	(0028,0011)	1	
Bits Allocated	(0028,0100)	1	
Bits Stored	(0028,0101)	1	
High Bit	(0028,0102)	1	
Pixel Representation	(0028,0103)	1	
Pixel Data	(7FE0,0010)	1	
Pixel Aspect Ratio	(0028,0034)	1C	If any value is set, Import AE will respond with “Cannot understand” to the C-STORE request. (See 3.2.3.2.2.1)
Smallest Image Pixel Value	(0028,0106)	3	
Largest Image Pixel Value	(0028,0107)	3	

8.2.10 Contrast/Bolus Module

This module is set if contrast media was used in the image.

Table 27

Attribute Name	Tag	Type	Attribute Description
Contrast/Bolus Agent	(0018,0010)	2	
Contrast/Bolus Route	(0018,1040)	3	
Contrast/Bolus Volume	(0018,1041)	3	
Contrast/Bolus Start Time	(0018,1042)	3	
Contrast/Bolus Stop Time	(0018,1043)	3	
Contrast/Bolus Total Dose	(0018,1044)	3	

8.2.11 VOI LUT Module

Table 28

Attribute Name	Tag	Type	Attribute Description
Window Center	(0028,1050)	3	
Window Width	(0028,1051)	1C	

8.2.12 SOP Common Module

Table 29

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	
SOP Instance UID	(0008,0018)	1	

8.2.13 CT Image Module

Table 30

Attribute Name	Tag	Type	Attribute Description
Image Type	(0008,0008)	1	
Samples per Pixel	(0028,0002)	1	
Photometric Interpretation	(0028,0004)	1	
Bits Allocated	(0028,0100)	1	
Bits Stored	(0028,0101)	1	
High Bit	(0028,0102)	1	
Rescale Intercept	(0028,1052)	1	
Rescale Slope	(0028,1053)	1	
KVP	(0018,0060)	2	
Acquisition Number	(0020,0012)	2	
Scan Options	(0018,0022)	3	
Data Collection Diameter	(0018,0090)	3	
Reconstruction Diameter	(0018,1100)	3	
Distance Source to Detector	(0018,1110)	3	
Distance Source to Patient	(0018,1111)	3	
Gantry/Detector Tilt	(0018,1120)	3	
Table Height	(0018,1130)	3	
Rotation Direction	(0018,1140)	3	
Exposure Time	(0018,1150)	3	
X-ray Tube Current	(0018,1151)	3	
Exposure	(0018,1152)	3	
Filter Type	(0018,1160)	3	
Generator Power	(0018,1170)	3	
Focal Spot	(0018,1190)	3	
Convolution Kernel	(0018,1210)	3	

8.2.14 MR Image Module

Table 31

Attribute Name	Tag	Type	Attribute Description
Image Type	(0008,0008)	1	
Samples per Pixel	(0028,0002)	1	
Photometric Interpretation	(0028,0004)	1	
Bits Allocated	(0028,0100)	1	
Scanning Sequence	(0018,0020)	1	
Sequence Variant	(0018,0021)	1	
Scan Options	(0018,0022)	2	
MR Acquisition Type	(0018,0023)	2	
Repetition Time	(0018,0080)	2C	
Echo Time	(0018,0081)	2	
Echo Train Length	(0018,0091)	2	
Inversion Time	(0018,0082)	2C	
Trigger Time	(0018,1060)	2C	
Sequence Name	(0018,0024)	3	
Echo Number	(0018,0086)	3	
Reconstruction Diameter	(0018,1100)	3	

9 Searching Keys

9.1 Query/Retrieve SCU (C-FIND)

The search keys used for the Query/Retrieve SCU (C-FIND) are shown.

9.1.1 Patient Root Information Model-FIND

9.1.1.1 Patient Level

Table 32

Attribute Name	Tag	Type
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	U
Patient’s Sex	(0010,0040)	O
Patient’s Age	(0010,1010)	O
Number of Patient Related Studies	(0020,12)	O
Number of Patient Related Series	(0020,12)	O
Number of Patient Related Images	(0020,12)	O

9.1.1.2 Study Level

Table 33

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Study Description	(0008,1030)	O
Study Instance UID	(0020,000D)	U
Study ID	(0020,0010)	R
Number of Study Related Series	(0020,1206)	O
Number of Study Related Images	(0020,1208)	O

9.1.1.3 Series Level

Table 34

Attribute Name	Tag	Type
Series Date	(0008,0021)	R
Series Time	(0008,0031)	R
Series Description	(0008,103E)	O
Modality	(0008,0060)	R
Series Instance UID	(0020,000e)	U
Series Number	(0020,0011)	R

9.1.2 Study Root Information Model-FIND

9.1.2.1 Study Level

Table 35

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Study Description	(0008,1030)	O
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	R
Patient’s Sex	(0010,0040)	O
Patient’s Age	(0010,1010)	O
Study Instance UID	(0020,000D)	U
Study ID	(0020,0010)	R
Number of Study Related Series	(0020,1206)	O
Number of Study Related Images	(0020,1208)	O

9.1.2.2 Series Level

Same as 9.1.1.3.

9.1.3 Patient/Study Only Information Model-FIND

9.1.3.1 Patient Level

Same as 9.1.1.1.

9.1.3.2 Study Level

Same as 9.1.1.2.