DICOM Conformance Statement

ST80i A.02

ICAP-T-030001.09b   Corresponds to ICAP-W-030001.02

PHILIPS

Issued by:

Philips Medical Systems Nederland BV, a Philips Healthcare company,

P.O. Box 10.000
5680 DA Best
The Netherlands

Email: dicom@philips.com
Internet: http://www.healthcare.philips.com/main/about/Connectivity/dicom_conformance_main.wpd

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1. DICOM Conformance Statement Overview

The ST80i A.02 implements the necessary DICOM services to:
(1) Search and retrieve worklists (lists of orders) from information systems,
(2) Start acquisition of Worklist item, acquire images and complete acquisition and finalize MPPS
(3) Save waveform objects to network storage system &
(4) Commit objects to storage systems.
The table below provides an overview of the network services supported by ST80i A.02.

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Table 1: Network Services

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SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	**UID**			
Other				
Transfer				
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	No	N/A
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	Yes	No	N/A
Verification SOP Class	1.2.840.10008.1.1	Yes	No	N/A
Workflow Management				
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No	N/A
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No	N/A
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No	N/A

ST80i A.02 does not support any DICOM media services.

2. Table of Contents

3. Introduction

ST80i software represents the core functionality pre-release of Philips stress system. The system is used to acquire, process, and store ECG data of patients undergoing stress exercise testing. The system provides standard 12-lead, as well as advanced 16-lead (deferred) ECG by the use of the 10-electrodes and 14-electrodes (deferred) Patient Interface Modules (PIM) respectively. The PIM interface to the system can be wired (deferred) or wireless by hardware options. The stress test system is to be used where the clinician decides to evaluate the electrocardiogram under stress of adult and pediatric patients as part of decisions regarding possible diagnosis, potential treatment, effectiveness of treatment, or to rule out causes for symptoms.

3.1.   Revision History

Table 2: Revision History

Document Version	Date of Issue	Status	Description
00	27-Oct-2016	Draft	Initial Version

3.2.   Audience

This Conformance Statement is intended for:
- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

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

3.3.   Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.
This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

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

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

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

3.4. Definitions, Terms and Abbreviations

Table 3: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
AE	Application Entity
AP	Application Profile
DICOM	Digital Imaging and Communications in Medicine
ECG	ElectroCardioGram
GUI	Graphic User Interface
IOD	Information Object Definition
Modality	A device that communicates using the DICOM standard
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
P/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier

3.5. References

[DICOM]   Digital Imaging and Communications in Medicine, Parts 1 - 20 (NEMA PS 3.1- PS 3.20),
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1752 Rosslyn, Virginia. 22209, United States of America
Internet: http://medical.nema.org/
Note that at any point in time the official standard consists of the most recent yearly edition of the base standard (currently 2016) plus all the supplements and correction items that have been approved as Final Text.

4. Networking

4.1.   Implementation model

The implementation model consists of three sections:
- The application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities,
- A functional description of each Application Entity, and
- The sequencing constraints among them.

4.1.1.   Application Data Flow

The operator of a ST80i A.02 initiates a Modality Worklist query when an up-to-date list is needed. This, in turn, causes a Modality Worklist query to the configured Modality Worklist server.

One Workitem is then selected from the Modality Worklist and the acquisition is started. On the start of study for the selected patient, the MPPS update is sent to the configured MPPS server. After acquiring the images, acquisition is completed and MPPS 'Completed' status is sent to the MPPS Server.

When the ECG has been acquired, the operator of a ST80i A.02 electrocardiograph initiates a single or batch transmission. This, in turn, causes one or more 12-Lead ECG objects or Encapsulated PDF Storage objects to be stored into the configured Storage SCP. If the Storage SCP is configured as an archive device the ST80i A.02 will request Storage Commitment and if a commitment is successfully obtained will record this information in local database.
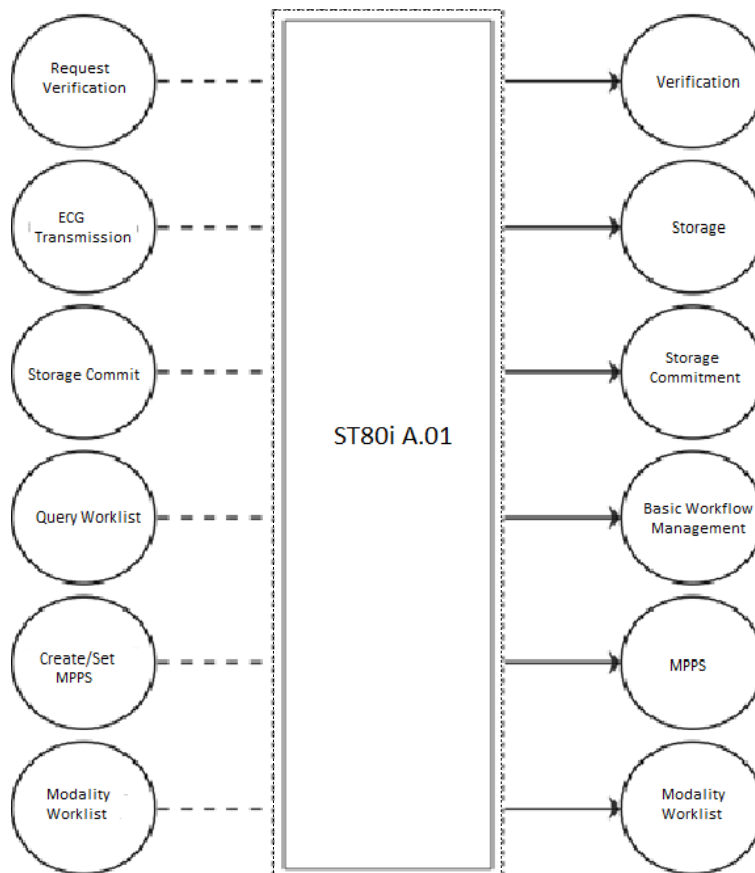
Figure 1: Application Data Flow Diagram

4.1.2.   Functional Definition of AE's

4.1.2.1.   Functional Definition of Storage Application Entity

After acquiring one or more, the operator can initiate a single or bah transmission of s. This causes the ST80i A.02 cardiograph to store each into the configured storage SCP. Each ECG is stored as a 12-Lead ECG object or Encapsulated PDF Storage Object.

4.1.2.2.   Functional Definition of Worklist Application Entity

ST80i incorporates the following functionality:
- The ST80i A.02 can verify application level communication by using the Verification service both as SCU (Verify).
- The ST80i A.02 can fetch Modality Worklist as SCU (MWL).
- The ST80i A.02 can Create/Set MPPS service as SCU (MPPS).
- The ST80i A.02 can store images and ECG objects by using the Storage service as SCU (Store Image).
- The ST80i A.02 can commit images by using the Storage Commitment service as SCU (Commit Image).

4.1.3.   Sequencing of Real World Activities
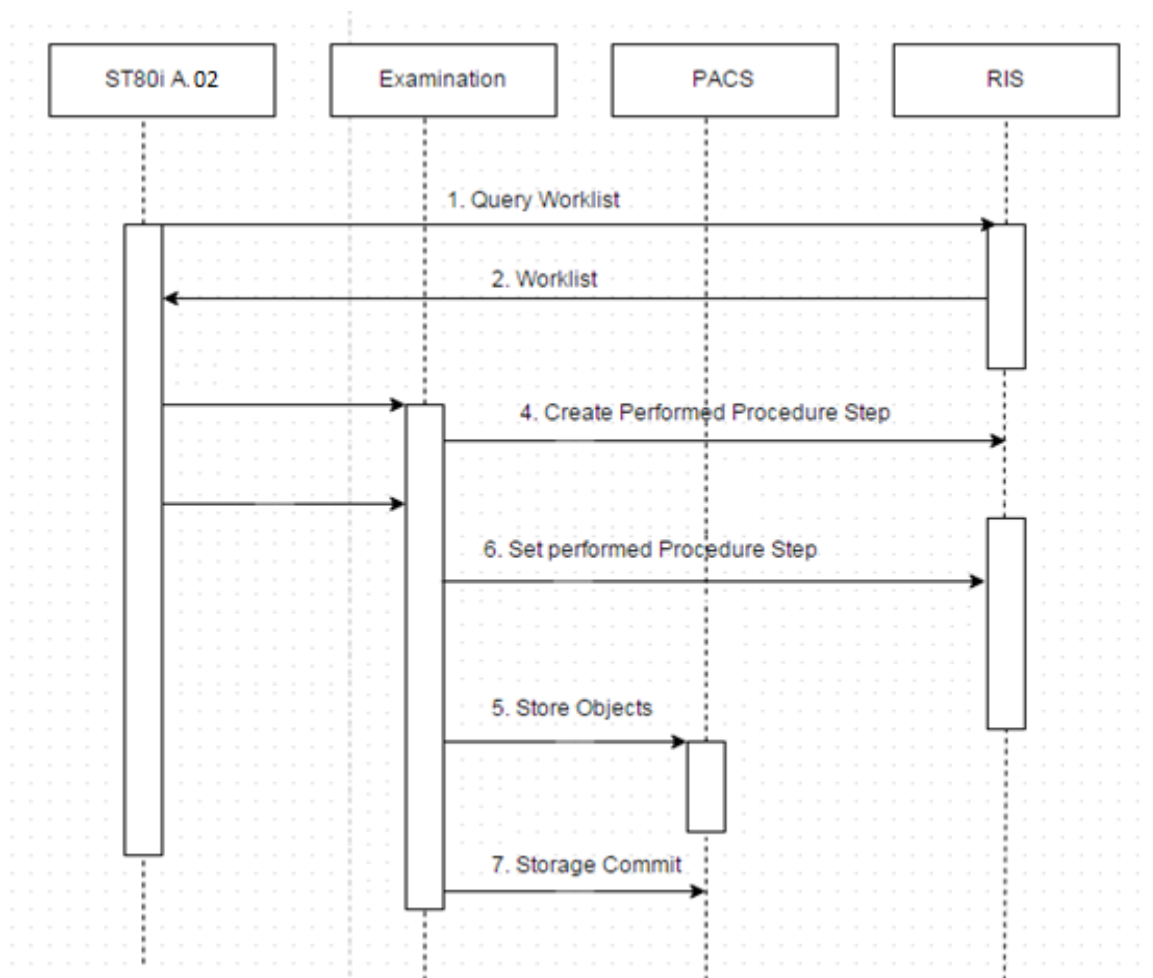
Figure 2: Sequence of Real World Activities

4.1.3.1.   AE Specifications

This section in the DICOM Conformance Statement is a set of Application Entity specifications. There are as many of these subsections as there are different AE's in the implementation.

4.1.4. Storage Application Entity

Detail of this specific Application Entity is specified in this section.

4.1.4.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 4: SOP Classes for Storage Application Entity

SOP Class Name	SOP Class UID	SCU	SCP
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	No
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.1.4.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.1.4.2.1. General

The DICOM standard application context is specified below.

Table 5: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.1.4.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as an Initiator is specified here.

Table 6: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

4.1.4.2.3. Asynchronous Nature

The implementation supports negotiation of multiple outstanding transactions, along with the maximum number of outstanding transactions supported.

Table 7: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	1

4.1.4.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

Table 8: DICOM Implementation Class and Version for Storage Application Entity

Implementation Class UID	1.3.46.670589.49.2.2.1
Implementation Version Name	ST80IDICOM_2_0_0

4.1.4.2.5.　　Communication Failure Handling

The behavior of the AE during communication failure is summarized in the next table.

Table 9: Communication Failure Behavior

Exception	Behavior
Timeout	The Association is released and the connection is closed.

4.1.4.3.　　Association Initiation Policy

The behavior of this Application Entity is summarized in the next Table.

Table 10: Response Status Handler Behavior

Service Status	Error Code	Further Meaning	Behavior
Success	0	PC accepted	The Presentation context is accepted and transfer syntax and abstract syntax are supported by the system.

The Application Entity will respond to a received Association rejection as shown in the next table.

Table 11: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - application-context-name-not supported	When association rejection occurs, ST80i A.02 displays "Operation failed"
		3 - calling-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"
		7 - called-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - protocol-version-not-supported	When association rejection occurs, ST80i A.02 displays "Operation failed"
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - local-limit-exceeded	When association rejection occurs, ST80i A.02 displays "Operation failed"
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - application-context-name-not-supported	When association rejection occurs, ST80i A.02 displays "Operation failed"
		3 - calling-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"
		7 - called-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"

Result	Source	Reason/Diagnosis	Behavior
		2 - protocol-version-not-supported	When association rejection occurs, ST80i A.02 displays "Operation failed"
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - local-limit-exceeded	When association rejection occurs, ST80i A.02 displays "Operation failed"

The behavior of the AE on receiving an Association abort is summarized in the next table.

Table 12: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	On receiving Abort, ST80i A.02 displays "Operation failed"
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	On receiving Abort, ST80i A.02 displays "Operation failed"
	1 - unrecognized-PDU	On receiving Abort, ST80i A.02 displays "Operation failed"
	2 - unexpected-PDU	On receiving Abort, ST80i A.02 displays "Operation failed"
	4 - unrecognized-PDU-parameter	On receiving Abort, ST80i A.02 displays "Operation failed"
	5 - unexpected-PDU-parameter	On receiving Abort, ST80i A.02 displays "Operation failed"
	6 - invalid-PDU-parameter-value	On receiving Abort, ST80i A.02 displays "Operation failed"

4.1.4.3.1. (Real-World) Activity – Verification as SCU

4.1.4.3.1.1. Description and Sequencing of Activities

The ST80i implements the Verification service class / Verification SOP class to verify application level communication.
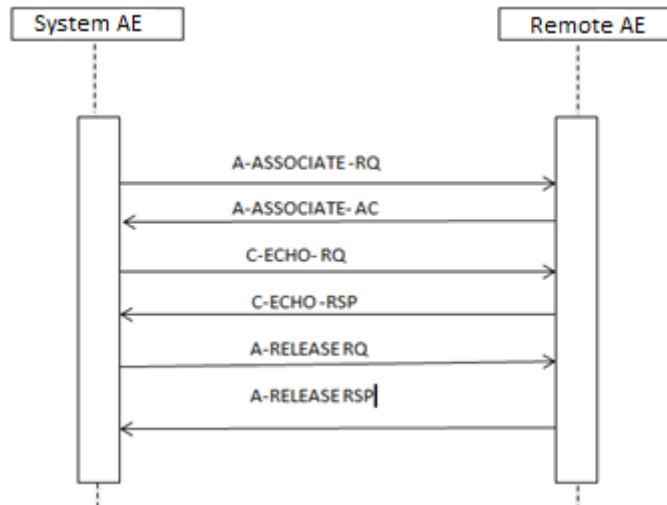
Figure 3: Data Flow Diagram – Verification as SCU

4.1.4.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 13: Proposed Presentation Contexts for (Real-World) Activity – Verification as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.1.4.3.1.3.   SOP Specific Conformance for Verification SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior. The ST80i provides standard conformance to the DICOM Verification service class.

4.1.4.3.1.3.1.   Dataset Specific Conformance for Verification C-ECHO SCU

14: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	The SCP has successfully returned a verification response

4.1.4.3.2.   (Real-World) Activity – Image Export

4.1.4.3.2.1.   Description and Sequencing of Activities

After generating an ECG, ST80i A.02 will initiate transmission of the DICOM object. This causes the ST80i A.02 to store into the configured Storage SCP. ECGs are stored using the 12-Lead ECG Waveform Object or as Encapsulated PDF Storage Object depending on the configuration settings.
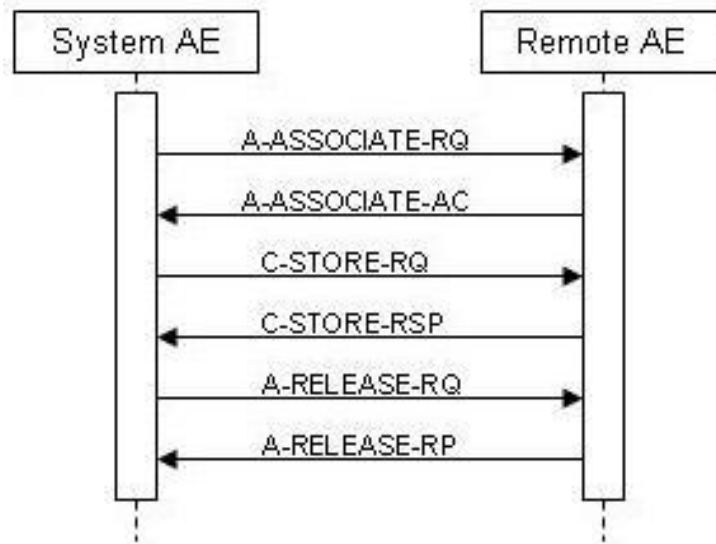
Figure 4: Image Export

4.1.4.3.2.2.   Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 15: Proposed Presentation Contexts for (Real-World) Activity – Image Export

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.1.4.3.2.3.　SOP Specific Conformance for Storage SOP Classes

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.1.4.3.2.3.1.　Dataset Specific Conformance for C-STORE-RQ

Detail regarding the Dataset Specific response behavior will be reported in this section.
This includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 16: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful stored	Store operation is successful.
Failure	A7xx	Refused: Out of Resources	On receiving error in C-STORE RSP messages, ST80i A.02 displays "Operation failed". Store operation is unsuccessful.
	A9xx	Error: Data Set does not match SOP Class	On receiving error in C-STORE RSP messages, ST80i A.02 displays "Operation failed". Store operation is unsuccessful.
	Cxxx	Error: cannot understand	On receiving error in C-STORE RSP messages, ST80i A.02 displays "Operation failed". Store operation is unsuccessful.
Warning	B000	Coercion of Data Elements	On receiving warning in C-STORE RSP messages, ST80i A.02 displays "Operation warning". Store operation is unsuccessful.
	B007	Data Set does not match SOP Class	On receiving warning in C-STORE RSP messages, ST80i A.02 displays "Operation warning". Store operation is unsuccessful.
	B006	Elements Discarded	On receiving warning in C-STORE RSP messages, ST80i A.02 displays "Operation warning". Store operation is unsuccessful.

4.1.4.4. Association Acceptance Policy

The Application Entity may reject Association attempts as shown in the table below.

Table 17: Association Reject Reasons

Result	Source	Reason/Diagnosis	Behavior
1 - rejected permanent	1 - DICOM UL service-user	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - application-context-name-not-supported	When association rejection occurs, ST80i A.02 displays "Operation failed"
		3 - calling-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"
		7 - called-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"

Result	Source	Reason/Diagnosis	Behavior
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - protocol-version-not-supported	When association rejection occurs, ST80i A.02 displays "Operation failed"
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - local-limit-exceeded	When association rejection occurs, ST80i A.02 displays "Operation failed"
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - application-context-name-not-supported	When association rejection occurs, ST80i A.02 displays "Operation failed"
		3 - calling-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"
		7 - called-AE-title-not-recognized	When association rejection occurs, ST80i A.02 displays "Operation failed"
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - protocol-version-not-supported	When association rejection occurs,ST80i A.02 displays "Operation failed"
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	When association rejection occurs, ST80i A.02 displays "Operation failed"
		2 - local-limit-exceeded	When association rejection occurs, ST80i A.02 displays "Operation failed"

The behavior of the AE for sending an Association abort is summarized in next table.

Table 18: Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	On receiving Abort request, ST80i A.02 displays "Operation failed"
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	On receiving Abort request, ST80i A.02 displays "Operation failed"
	1 - unrecognized-PDU	On receiving Abort request, ST80i A.02 displays "Operation failed"
	2 - unexpected-PDU	On receiving Abort request, ST80i A.02 displays "Operation failed"
	4 - unrecognized-PDU parameter	On receiving Abort request, ST80i A.02 displays "Operation failed"
	5 - unexpected-PDU parameter	On receiving Abort, ST80i A.02 displays "Operation failed"
	6 - invalid-PDU-parameter value	On receiving Abort, ST80i A.02 displays "Operation failed"

4.1.5.   Storage Commitment AE

Detail of this specific Application Entity is specified in this section.

4.1.5.1.   Description and Sequencing of Activities

Archive means that ST80i A.02 stores images with Storage Commitment. ST80i A.02 supports synchronous and asynchronous storage commitment.

The ST80i A.02 will request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the ST80i A.02 will send the store request, wait for response and then release the association. The store response status may be inspected on the UI. The Transferred image cannot be deleted from the system until the Storage Commit N-EVENT is received.

For the configured DICOM Storage Commitment node, the images are sent along with Storage Commitment Request. The image is delete-protected until the Storage Commit Response has been received. The current status is shown in the Image Info Panel.
In case of a wrong configuration (an archive is configured to support Storage Commitment, but does not really do so), the association is rejected by the archive for Storage commitment request. The system recognizes this and the application updates the spooler with a successful Storage Commitment job.
Timeout configuration for Asynchronous Storage Commitment option is not available on the system. However the application will keep listening for Storage Commit N-EVENT if any pending job is existing in the job spooler. The job will move to a suspended state if the ST80i A.02 application is offline. However, the Application Entity responsible for the commitment result message should be able to handle the suspended state of the request. It is expected to finalize the commitment request when the ST80i A.02 application comes online again.
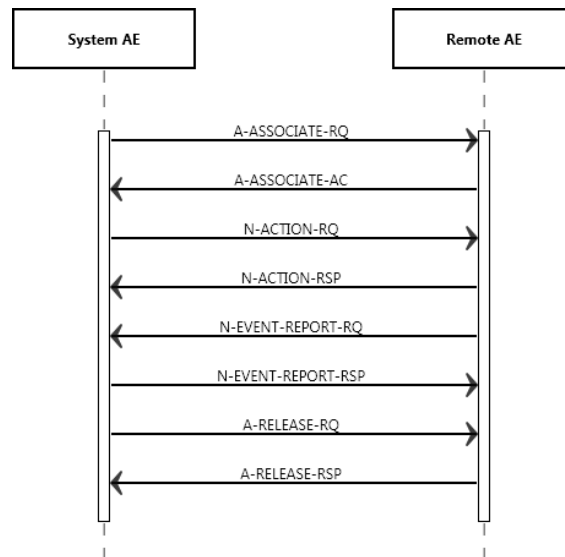
Figure 5: (Real World) Activity - Storage Commitment Push Model as SCU (Synchronous)
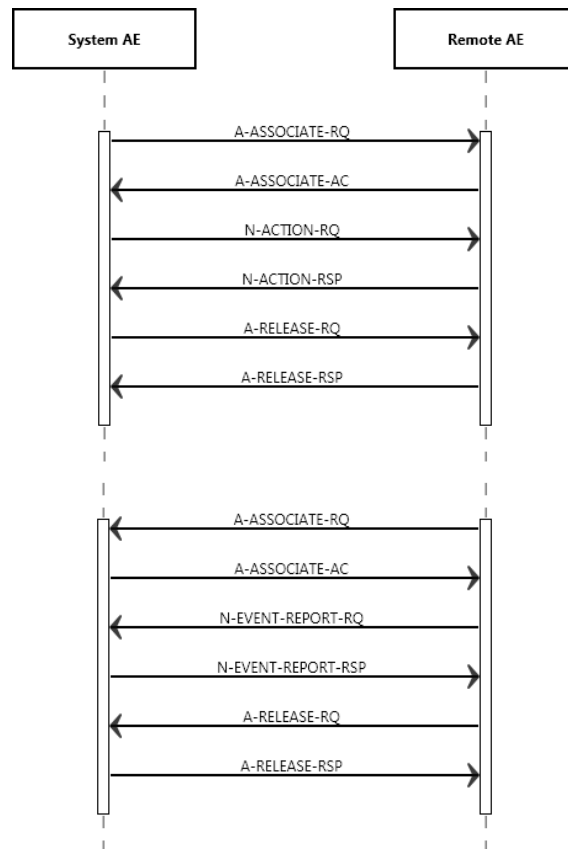
Figure 6: (Real World) Activity - Storage Commitment Push Model as SCU (Asynchronous)

4.1.5.2.   Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 19: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model as SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
Storage Commitment Pull Model SOP Class	1.2.840.10008.1.20.2			SCU	None

4.1.5.3.   SOP Specific Conformance for Storage Commitment Push Model SOP Class

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc.
Behavior of an Application Entity SOP class is summarized as shown in next Table.
The standard as well as the manufacturer specific status codes and their corresponding behavior are specified.

4.1.5.4.   Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-EVENT-REPORT-SCP

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 20: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.1.5.5. Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 21: Storage Commitment Attribute for N-ACTION-RQ

Attribute Name	Tag	Comment
Storage Commitment Module		
Transaction UID	0008,1195	
Referenced SOP Sequence	0008,1199	
>Referenced SOP Class UID	0008,1150	
>Referenced SOP Instance UID	0008,1155	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 22: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	The request for storage commitment is considered successfully stored.
Other than Success	<>0000	Problems with sending the N-ACTION Request	The request for storage commitment is marked as failed.

4.1.6. Worklist Application Entity

Detail of this specific Application Entity is specified in this section.

4.1.6.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 23: SOP Classes for Worklist Application Entity

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.1.6.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.1.6.2.1. General

The DICOM standard application context is specified below.

Table 24: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.1.6.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as an Initiator is specified here.

Table 25: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

4.1.6.2.3. Asynchronous Nature

The implementation supports negotiation of multiple outstanding transactions, along with the maximum number of outstanding transactions supported.

Table 26: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	0

4.1.6.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

Table 27: DICOM Implementation Class and Version for Worklist Application Entity

Implementation Class UID	1.3.46.670589.49.2.2.1
Implementation Version Name	ST80IDICOM_2_0_0

4.1.6.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in the next table.

Table 28: Communication Failure Behavior

Exception	Behavior
Timeout	e.g The Association is aborted using A-ABORT and the command is marked as failed. The reason is logged and reported to the user.

4.1.6.3. Association Initiation Policy

The behavior of this Application Entity is summarized in the next Table.

Table 29: Response Status Handler Behavior

Service Status	Error Code	Further Meaning	Behavior
Success	0	The Presentation Context is accepted	

The Application Entity will respond to a received Association rejection as shown in the next table.

Table 30: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	No indication on Worklist Window
		2 - application-context-name-not supported	No indication on Worklist Window
		3 - calling-AE-title-not-recognized	No indication on Worklist Window
		7 - called-AE-title-not-recognized	No indication on Worklist Window
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	No indication on Worklist Window
		2 - protocol-version-not-supported	No indication on Worklist Window
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	No indication on Worklist Window
		2 - local-limit-exceeded	No indication on Worklist Window
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	No indication on Worklist Window
		2 - application-context-name-not-supported	No indication on Worklist Window
		3 - calling-AE-title-not-recognized	No indication on Worklist Window
		7 - called-AE-title-not-recognized	No indication on Worklist Window
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	No indication on Worklist Window
		2 - protocol-version-not-supported	No indication on Worklist Window
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	No indication on Worklist Window
		2 - local-limit-exceeded	No indication on Worklist Window

The behavior of the AE on receiving an Association abort is summarized in the next table.

Table 31: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	On receiving Abort request, ST80i A.02 displays "Operation failed"
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	On receiving Abort request, ST80i A.02 displays "Operation failed"
	1 - unrecognized-PDU	On receiving Abort request, ST80i A.02 displays "Operation failed"
	2 - unexpected-PDU	On receiving Abort request, ST80i A.02 displays "Operation failed"
	4 - unrecognized-PDU-parameter	On receiving Abort request, ST80i A.02 displays "Operation failed"
	5 - unexpected-PDU-parameter	On receiving Abort request, ST80i A.02 displays "Operation failed"
	6 - invalid-PDU-parameter-value	On receiving Abort request, ST80i A.02 displays "Operation failed"

4.1.6.3.1.   (Real-World) Activity – Modality worklist As SCU

4.1.6.3.1.1.   Description and Sequencing of Activities

The operator of the ST80i A.02 can choose to retrieve an up-to-date worklist. To initiate this function, the operator will run a query from the cardiograph, with or without optional search criteria. When the operator starts the query process, the ST80i A.02 will query the DICOM Modality Worklist service provider for the Modality Worklist, using the search criteria if provided. The list of orders is returned to the cardiograph and displayed to the operator.
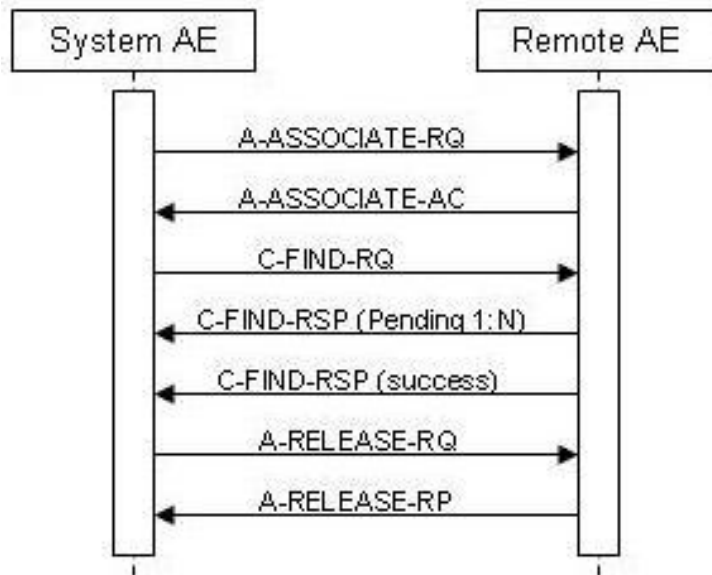
Figure 7: Modality Worklist as SCU

4.1.6.3.1.2.   Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 32: Proposed Presentation Contexts for (Real-World) Activity – Modality worklist As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.1.6.3.1.3.   SOP Specific Conformance for Modality Worklist Information Model - FIND SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.1.6.3.1.3.1.   Dataset Specific Conformance for Modality Worklist Information Model - FIND SOP Class C-FIND-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
The table below should be read as follows:

Attribute Name:	Attributes supported to build a Modality Worklist Request Identifier.
Tag:	DICOM tag for this attribute.
VR:	DICOM VR for this attribute.
M:	Matching Keys for Worklist Update.
R:	Return Keys. An "X" will indicate that this attribute as matching key can be used.
Q:	Interactive Query Key. An "X" will indicate that this attribute as matching key can be used.
D:	Displayed Keys. An "X" indicates that this Worklist attribute is displayed on the user interface during a patient registration dialog.
IOD:	An "X" indicates that this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.
Type of matching:	The following types of matching exists:
	Single Value Matching
	List of UID matching
	Wild Card matching
	Range matching
	Sequence matching
	Universal matching

Table 33: Worklist Request Identifier

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Module: Patient Identification Module (M)									
Patient's Name	0010,0010	PN	X	X		X		Universal	
Patient ID	0010,0020	LO		X		X		Universal	Input field: Patient ID
Other Patient IDs	0010,1000	LO		X				Universal	
Module: Patient Demographic Module (M)									
Patients Birth Date	0010,0030	DA		X		X		Universal	Input field: DOB
Patient's Sex	0010,0040	CS		X		X		Universal	Sex of the named patient. Enumerated Values: M = male F = female O = other
Patient Age	0010,1010	AS		X		X		Universal	Age of the Patient.
Patient Size	0010,1020	DS		X		X		Universal	Patient's height or length in meters
Patient's Weight	0010,1030	DS		X		X		Universal	Weight of the patient in kilograms
Ethnic Group	0010,2160	SH		X		X		Universal	
Module: Patient Medical Module (M)									
Medical Alerts	0010,2000	LO		X				Universal	

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Module: Visit Identification Module (M)									
Institution Name	0008,0080	LO	X					Universal	
Admission ID	0038,0010	LO	X					Universal	
Module: Visit Status Module (M)									
Current Patient Location	0038,0300	LO	X					Universal	
Patient Institution Residence	0038,0400	LO	X					Universal	
Module: Scheduled Procedure Step Module (M)									
Scheduled Procedure Step Sequence	0040,0100	SQ	X					Universal	
>Modality	0008,0060	CS	X	X	X			Single	Fixed value "ECG"
>Scheduled Station AE Title	0040,0001	AE	X	X				Universal	Input field: Station AE
>Scheduled Procedure Step Start Date	0040,0002	DA	X	X	X	X		Range, Universal	Input field: Start date (From ~ To)
>Scheduled Procedure Step Start Time	0040,0003	TM	X		X			Universal	"Order Request" is displayed on UI.
>Scheduled Procedure Step Description	0040,0007	LO	X		X			Universal	
>Scheduled Protocol Code Sequence	0040,0008	SQ	X					Universal	
>>Code Value	0008,0100	SH	X					Universal	
>>Coding Scheme Version	0008,0103	SH	X					Universal	
>> Coding Scheme Designator	0008,0102	SH	X					Universal	
>>Code Meaning	0008,0104	LO	X		X			Universal	
>Scheduled Procedure Step ID	0040,0009	SH	X					Universal	
>Scheduled Station Name	0040,0010	SH	X					Universal	
>Scheduled Procedure Step Location	0040,0011	SH	X					Universal	
Module: Requested Procedure Step Module (M)									
Study Instance UID	0020,000D	UI	X					Universal	
Requested Procedure Description	0032,1060	LO	X		X			Universal	
Requested Procedure Code Sequence	0032,1064	SQ	X					Universal	
>Code Value	0008,0100	SH	X					Universal	
>Coding Scheme Version	0008,0103	SH	X					Universal	
>Coding Scheme Designator	0008,0102	SH	X					Universal	
>Code Meaning	0008,0104	LO	X		X			Universal	
Requested Procedure ID	0040,1001	SH	X	X	X			Universal	Input field: Requested Procedure ID
Requested Procedure Priority	0040,1003	SH	X					Universal	
Requested Procedure Location	0040,1005	LO	X					Universal	
Module: Imaging Service Request Module (M)									
Accession Number	0008,0050	SH	X	X	X	X		Universal	Input field: Order Number
Referring Physician's Name	0008,0090	PN	X		X			Universal	
Requesting Physician	0032,1032	PN	X					Universal	
Module: Additional Attributes Module (M)									
Study Description	0008,1030	LO	X					Universal	
Study ID	0020,0010	SH	X					Universal	
Series Number	0020,0011	IS	X					Universal	

Table 34: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The SCU has successfully returned all matching information
Error	C000	Unable to Process	The SCU displays no response. Association is closed
Failed	A900	Identifier does not match SOP class	The SCU displays no response. Association is closed
Refused	A700	Refused Request	The SCU displays no response. Association is closed
Pending	FF01		The SCU displays no response. Association is closed
Warning	FF01		The SCU displays responses.

4.1.6.4. Association Acceptance Policy

The Application Entity may reject Association attempts as shown in the table below.

Table 35: Association Reject Reasons

Result	Source	Reason/Diagnosis	Behavior
1 - rejected permanent	1 - DICOM UL service-user	1 - no-reason-given	No indication on Worklist Window
		2 - application-context-name-not-supported	No indication on Worklist Window
		3 - calling-AE-title-not-recognized	No indication on Worklist Window
		7 - called-AE-title-not-recognized	No indication on Worklist Window
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	No indication on Worklist Window
		2 - protocol-version-not-supported	No indication on Worklist Window
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	No indication on Worklist Window
		2 - local-limit-exceeded	No indication on Worklist Window
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	No indication on Worklist Window
		2 - application-context-name-not-supported	No indication on Worklist Window
		3 - calling-AE-title-not-recognized	No indication on Worklist Window
		7 - called-AE-title-not-recognized	No indication on Worklist Window
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	No indication on Worklist Window
		2 - protocol-version-not-supported	No indication on Worklist Window
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	No indication on Worklist Window
		2 - local-limit-exceeded	No indication on Worklist Window

The behavior of the AE for sending an Association abort is summarized in next table.

Table 36: Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	On receiving Abort request, ST80i A.02 displays "Operation failed"
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	On receiving Abort request, ST80i A.02 displays "Operation failed"
	1 - unrecognized-PDU	On receiving Abort request, ST80i A.02 displays "Operation failed"
	2 - unexpected-PDU	On receiving Abort request, ST80i A.02 displays "Operation failed"
	4 - unrecognized-PDU parameter	On receiving Abort request, ST80i A.02 displays "Operation failed"
	5 - unexpected-PDU parameter	On receiving Abort request, ST80i A.02 displays "Operation failed"

Source	Reason/Diagnosis	Behavior
	6 - invalid-PDU-parameter value	On receiving Abort request, ST80i A.02 displays "Operation failed"

4.1.6.4.1.   (Real-World) Activity – Modality Performed Procedure Step as SCU

4.1.6.4.1.1.   Description and Sequencing of Activities
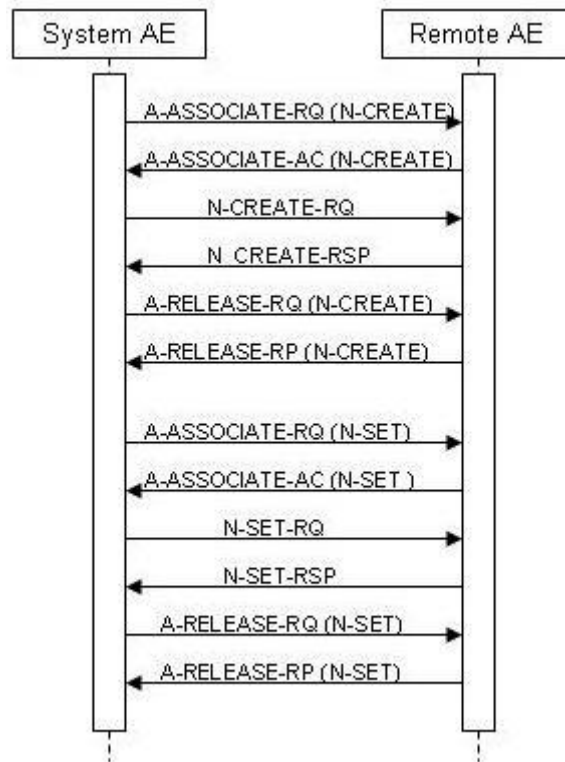
Figure 8: (Real World) Activity - Modality Performed Procedure Step as SCU

Description of Activities

After the image for a Scheduled Procedure Step has been acquired, the system sets the MPPS status of the related examination to "IN PROGRESS" and generates an initial MPPS in progress message. The system does not generate intermediate MPPS in progress message for subsequent acquisitions of this Scheduled Procedure Step instance.

After finishing the appropriate acquisition(s), the system will change the MPPS status of the related examination to "COMPLETED: and generate and MPPS N-SET-FINAL message.

4.1.6.4.1.2.   Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 37: Proposed Presentation Contexts for (Real-World) Activity – Modality Performed Procedure Step As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.1.6.4.1.3. SOP Specific Conformance for Modality Performed Procedure Step SOP Class

When acquiring the first image of a Scheduled or Unscheduled Procedure Step, ST80i A.02 generates a MPPS IN PROGRESS message.

4.1.6.4.1.3.1. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-CREATE-SCU

This section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 38: MPPS Request Identifiers for N-CREATE-RQ

Attribute Name	Tag	VR	Value	Comment
SOP Common Module				
Specific Character Set	0008,0005	CS		
Performed Procedure Step Relationship Module				
Patient ID	0010,0020	LO		
Patient's Birth Date	0010,0030	DA		
Patient's Name	0010,0010	PN		
Patient's Sex	0010,0040	CS		
Referenced Patient Sequence	0008,1120	SQ		
> Referenced SOP Class UID	0008,1150	UI		
> Referenced SOP Instance UID	0008,1155	UI		
Scheduled Step Attributes Sequence	0040,0270	SQ		
>Accession Number	0008,0050	SH		
>Requested Procedure Description	0032,1060	LO		
>Requested Procedure ID	0040,1001	SH		
>Scheduled Procedure Step Description	0040,0007	LO		
>Study Instance UID	0020,000D	UI		
>Referenced Study Sequence	0008,1110	SQ		
>>Referenced SOP Class UID	0008,1150	UI		
>>Referenced SOP Instance UID	0008,1155	UI		
>Scheduled Protocol Code Sequence	0040,0008	SQ		
>>Code Meaning	0008,0104	LO		
>>Code Value	0008,0100	SH		
>>Coding Scheme Designator	0008,0102	SH		
>Scheduled Procedure Step ID	0040,0009	SH		
Performed Procedure Step Information Module				
Performed Location	0040,0243	SH		EMPTY
Performed Procedure Step Description	0040,0254	LO		
Performed Procedure Step End Date	0040,0250	DA		Finish of the examination: EMPTY
Performed Procedure Step End Time	0040,0251	TM		Finish of the examination: EMPTY

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step ID	0040,0253	SH		
Performed Procedure Step Start Date	0040,0244	DA		Start of the examination
Performed Procedure Step Start Time	0040,0245	TM		Start of the examination
Performed Procedure Step Status	0040,0252	CS	IN PROGRESS	
Performed Procedure Type Description	0040,0255	LO		
Performed Station AE Title	0040,0241	AE	Local AE Title of the System.	
Performed Station Name	0040,0242	SH		EMPTY
Procedure Code Sequence	0008,1032	SQ		
>Code Meaning	0008,0104	LO		
>Code Value	0008,0100	SH		
>Coding Scheme Designator	0008,0102	SH		
Image Acquisition Results Module				
Modality	0008,0060	CS	""	
Study ID	0020,0010	SH		
Performed Protocol Code Sequence	0040,0260	SQ		
>Code Meaning	0008,0104	LO		
>Code Value	0008,0100	SH		
>Coding Scheme Designator	0008,0102	SH		
Performed Series Sequence	0040,0340	SQ		
>Retrieve AE Title	0008,0054	AE	Local AE Title of the System.	
>Series Description	0008,103E	LO		
>Performing Physician's Name	0008,1050	PN		
>Operator's Name	0008,1070	PN		
>Referenced Image Sequence	0008,1140	SQ		
>> Referenced SOP Class UID	0008,1150	UI		
>>Referenced SOP Instance UID	0008,1155	UI		
>Protocol Name	0018,1030	LO		
>Series Instance UID	0020,000E	UI		
> Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ		
>> Referenced SOP Class UID	0008,1150	UI		
>> Referenced SOP Instance UID	0008,1155	UI		
Additional Attributes Module				
SOP Class UID	0008,0016	UI		

Table 39: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful operation	The SCP has successfully received the modality performed procedure step create request. Log entry.

Table 40: DICOM Command Communcation Failure Behavior

Exception	Behavior
Timeout	The association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.1.6.4.1.3.2. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-SET-SCU

This section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 41: MPPS Request Identifiers for N-SET-RQ

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Information Module				
Performed Procedure Step End Date	0040,0250	DA		End date of the examination
Performed Procedure Step End Time	0040,0251	TM		End time of the examination
Performed Procedure Step Status	0040,0252	CS	COMPLETED	
Additional Attributes Module				
SOP Class UID	0008,0016	UI		

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 42: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	The association is released.

Table 43: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.

4.2.   Network Interfaces

4.2.1.   Physical Network Interfaces

ST80i A.02 supports a single network interface. The physical network interface depends on the host server on which the ST80i A.02 is installed.

4.2.2.   Additional Protocols

Not applicable

4.3.   Configuration

Any implementation's DICOM conformance may be dependent upon configuration, which takes place at the time of installation. Issues concerning configuration are addressed in this section.

4.3.1.   AE Title/Presentation Address Mapping

An important installation issue is the translation from AE title to presentation address. How this is to be performed is described here.

4.3.1.1.   Local AE Titles

The AE Titles and P/IP Ports configured from the ST80i A.02 Configuration GUI. Every DICOM service can use different AE Title.

4.3.1.2.   Remote AE Title/Presentation Address Mapping

The AE Title, host names and port numbers of remote applications are configured using the ST80i A.02 Configuration GUI.

4.3.2.   Parameters

A number of parameters related to general operation can be configured using the ST80i A.02 Configuration GUI. The table below only shows those configuration parameters relevant to DICOM communications, grouped according the specific ST80i A.02 application. See the ST80i A.02 Manual on the application for details on general configuration capabilities.

The ST80i A.02 supports the following configuration parameters:

Table 44: ST80i A.02 Parameters

Parameter Description	Configurable(Yes/No)	Default Value
SOP Class	Yes	"Based on Lead Count", which means 12-Lead ECG Waveform with only 12 leads with more than 12 leads*

* When ST80i A.02 creates a report with more than 13 leads, the DICOM object created contains more than 13 leads data.
The attribute Number of Waveform Channels (003A, 0005) will has a value more than 13.

Table 45: ST80i A.02 Parameters (SCU Worklist Retrieval Settings-Remote System Information for C-FIND

Parameter Description	Configurable(Yes/No)	Default Value
AE Title	Yes	-
Host Address	Yes	-
Host Port	Yes	-

Table 46: ST80i A.02 Parameters (SCU Record Storage Settings - Remote System Information for C-STORE)

Parameter Description	Configurable(Yes/No)	Default Value
AE Title	Yes	-
Host Address	Yes	-
Host Port	Yes	-

5. Media Interchange

5.1.　Implementation model

Not applicable.

5.1.1.　Application Data Flow Diagram

Not applicable.

5.1.2.　Functional Definitions of AE's

Not applicable.

5.1.3.　Sequencing of Real World Activities

Not applicable.

5.2.　AE Specifications

Not applicable

5.3.　Augmented and Private Application Profiles

Not applicable

5.4.　Media Configuration

Not applicable.

6. Support of Character Sets

Any support for character sets in Network and Media services is described here.

Table 47: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859

7. Security

7.1. Security Profiles

Not applicable

7.1.1. Security use Profiles

Not applicable

7.1.2. Security Transport Connection Profiles

Not applicable

7.1.3. Digital Signature Profiles

Not applicable

7.1.4. Media Storage Security Profiles

Not applicable

7.1.5. Attribute Confidentiality Profiles

Not applicable

7.1.6. Network Address Management Profiles

Not applicable

7.1.7. Time Synchronization Profiles

Not applicable

7.1.8. Application Configuration Management Profiles

Not applicable

7.1.9. Audit Trail Profiles

Not applicable

7.2. Association Level Security

Not applicable

7.3. Application Level Security

Not applicable

8. Annexes of application "ST80i A.02"

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created by this application.

This section specifies each IOD created (including private IOD's). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, e.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

8.1.1.1. List of created SOP Classes

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Table 48: List of created SOP Classes

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SOP Class Name	SOP Class UID
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1
Encapsulated PDF Report Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1

8.1.1.2. 12-Lead ECG Waveform Storage SOP Class

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Table 49: IOD of Created 12-Lead ECG Waveform Storage SOP Class Instances

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Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Waveform	Acquisition Context Module	ALWAYS
Waveform	Waveform Identification Module	ALWAYS

Waveform		Waveform Module	ALWAYS
Waveform		Waveform Annotation Module	CONDITIONAL
Waveform		SOP Common Module	ALWAYS

Table 50: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	MWL	Patient's full name. (Patient First Name/Last Name)
Patient ID	0010,0020	LO		VNAP	MWL	Primary hospital identification number or code for the patient. (Patient ID)
Patient's Birth Date	0010,0030	DA		VNAP	MWL	Birth date of the patient. (DateOfBirth)
Patient's Sex	0010,0040	CS		VNAP	MWL	Sex of the named patient. Enumerated Values: "M" = male, F=Female, O=Other
Ethnic Group	0010,2160	SH		ANAP	MWL	Ethnic group or race of the patient. (Race)

Table 51: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP		Date the Study started (Acquisition Date – output only)
Study Time	0008,0030	TM		VNAP		Time the Study started (Acquisition Time – output only)
Accession Number	0008,0050	SH		VNAP	MWL	A number that identifies the order for the study (Order Number)
Referring Physician's Name	0008,0090	PN		VNAP	MWL	Name of the patient's referring physician. (Referring Doctor Name)
Study Description	0008,1030	LO		ANAP	MWL	Institution-generated description or classification of the Study (component) performed. (Test Reason)
Study Instance UID	0020,000D	UI		ALWAYS	MWL	Unique identifier for the Study. For MWL, or generated by ST80i A.02 using: D prefix: 1.3.46.670589.32 Time Clock Random Number
Study ID	0020,0010	SH		VNAP	MWL	User or equipment generated Study identifier. For output this will be blank.

Table 52: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		VNAP	USER	Age of the Patient. (Age)
Patient's Size	0010,1020	DS		VNAP	USER	Length or size of the Patient, in meters. (Height)
Patient's Weight	0010,1030	DS		VNAP	USER	Weight of the Patient, in kilograms. (Weight)
Admission ID	0038,0010	LO		ANAP	MWL	Identification number of the visit as assigned by the healthcare provider.

Table 53: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	""	ALWAYS	FIXED	Type of equipment that originally acquired the data used to create the images in this Series. For output this will always be "".
Operators' Name	0008,1070	PN		ANAP	USER	Name(s) of the operator(s) supporting the Series. (Technician Name)
Series Instance UID	0020,000E	UI		ALWAYS		Unique identifier for the Series. ST80i A.02 will generate this as: D prefix: 1.3.46.670589.32 Time Clock Random Number Suffix: 1
Series Number	0020,0011	IS		VNAP	MWL	A number that identifies this Series. For output this will be blank
Laterality	0020,0060	CS		ANAP		Laterality of (paired) body part examined. Required if the body part examined is a paired structure and Image Laterality (0020,0062) or Frame Laterality (0020,9072) are not sent. For output this will always be blank.
Performed Protocol Code Sequence	0040,0260	SQ		ALWAYS		Needed to distinguish resting s from other types. ONLY PRESENT FOR SOP CLASS OUTPUT.
>Code Value	0008,0100	SH		ANAP		This will be "P2-3120A".
>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "SRT".
>Code Meaning	0008,0104	LO		ANAP		This will be "12-Lead ECG".

Table 54: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	VNAP	FIXED	Philips Medical Systems
Institution Name	0008,0080	LO	If the institution name in MWL is empty, the local institution name is used.	ANAP	MWL, USER	Institution where the equipment that produced the composite instances is located. (Institution Name)
Station Name	0008,1010	SH	Value is empty	ANAP	FIXED	User defined name identifying the machine that produced the composite instances (Cart ID)
Institutional Department Name	0008,1040	LO		ANAP	USER	Department in the institution where the equipment that produced the composite instances is located. (Department Name)
Manufacturer's Model Name	0008,1090	LO	According to different type. 80315 (70) 80310 (50) 80306 (30/20)	ANAP	FIXED	Manufacturer's model name of the equipment that produced the composite instances (Cart Model)
Device Serial Number	0018,1000	LO		ANAP		Manufacturer's serial number of the equipment that produced the composite instances. (Cart Serial Number)
Software Version(s)	0018,1020	LO	A.02.00	ANAP	AUTO	Manufacturer's designation of software version of the equipment that produced the composite instances. (Cart Version)

Table 55: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP		A sequence of items that describes the conditions present during the acquisition of the data of the SOP instance. Zero or more items may be included in this sequence.
>Value Type	0040,A040	CS		VNAP		The type of the value encoded in this item. This will be "CODE".
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS		A concept that constrains the meaning of (i.e. defines the role of) observation value.
>>Code Value	0008,0100	SH		ANAP		This will be "5.4.5-33-1-1" which means "Standard 12-Lead ECG electrode placement: limb leads placed at extremities"
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "SCP"
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.3"
>>Code Meaning	0008,0104	LO		ANAP		This will be "Electrode Placement"
>Concept Code Sequence	0040,A168	SQ		ALWAYS		This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a Coded Value.
>>Code Value	0008,0100	SH		ANAP		This will be "5.4.5-33-1-1" which means "Standard 12-Lead ECGpositions: limb leads placed at extremities"
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "SCP"
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.3"
>>Code Meaning	0008,0104	LO		ANAP		This will be "Standard 12-Lead ECGPositions"
>Value Type	0040,A040	CS		VNAP		The type of the value encoded in this item. This will be "NUMERIC".
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS		A concept that constrains the meaning of (i.e. defines the role of) observation value.
>>Code Value	0008,0100	SH		ANAP		This will be "F-008EC" which means "Systolic Blood Pressure"
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be " SRT "
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be ""
>>Code Meaning	0008,0104	LO		ANAP		This will be "Systolic Blood Pressure"
>Measurement Units Code Sequence	0040,08EA	SQ		ALWAYS		Units of measurement. Only a single Item shall be included in this Sequence. Required if Numeric Value (0040,A30A) is sent. Shall not be present otherwise.
>>Code Value	0008,0100	SH		ANAP		This will be "mmHg" which means "millimeters Hg"
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "UCUM"
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.4"
>>Code Meaning	0008,0104	LO		ANAP		This will be "millimeters Hg"
>Numeric Value	0040,A30A	DS		VNAP		This will be the systolic BP value.
>Value Type	0040,A040	CS		VNAP		The type of the value encoded in this item. This will be "NUMERIC".

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS		A concept that constrains the meaning of (i.e. defines the role of) observation value.
>>Code Value	0008,0100	SH		ANAP		This will be "F-008ED" which means "Diastolic Blood Pressure"
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "SRT"
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be ""
>>Code Meaning	0008,0104	LO		ANAP		This will be "Diastolic Blood Pressure"
>Measurement Units Code Sequence	0040,08EA	SQ		ALWAYS		Units of measurement. Only a single Item shall be included in this Sequence. Required if Numeric Value (0040,A30A) is sent. Shall not be present otherwise.
>>Code Value	0008,0100	SH		ANAP		This will be "mmHg" which means "millimeters Hg"
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "UCUM"
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.4"
>>Code Meaning	0008,0104	LO		ANAP		This will be "millimeters Hg"
>Numeric Value	0040,A30A	DS		VNAP		This will be the diastolic BP value.
>Value Type	0040,A040	CS		VNAP		The type of the value encoded in this item. This will be "TEXT".
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS		A concept that constrains the meaning of (i.e. defines the role of) observation value.
>>Code Value	0008,0100	SH		ANAP		This will be "G-02D0" which means "Regular Medication"
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "SRT"
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be ""
>>Code Meaning	0008,0104	LO		ANAP		This will be "Regular Medication"
>Text Value	0040,160	UT		VNAP		This will be the medication.

Table 56: Waveform Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS		The date the waveform data was created
Acquisition Datetime	0008,002A	DT		ALWAYS		The date and time that the acquisition of data that resulted in this waveform. (Acquisition Date/Time)
Content Time	0008,0033	TM		ALWAYS		The time the Waveform data was created
Instance Number	0020,0013	IS		ALWAYS		A number that identifies this waveform. For output this will always be "1". "

Table 57: Waveform Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Waveform Sequence	5400,0100	SQ		ALWAYS		Sequence of one or more Items, each representing one waveform multiplex group
> Multiplex Group Time Offset	0018,1068	DS		ALWAYS		
>Trigger Time Offset	0018,1069	DS		ALWAYS		
>Waveform Originality	003A,0004	CS		ALWAYS		This will be "ORIGINAL" for the rhythm data and "DERIVED" for median data.

>Number of Waveform Channels	003A,0005	US		ALWAYS		Number of channels for this multiplex group
>Number of Waveform Samples	003A,0010	UL		ALWAYS		Number of samples per channel in this multiplex group. (Lead Sample Count / Median Sample Count)
>Sampling Frequency	003A,001A	DS		ALWAYS		Frequency in Hz
>Multiplex Group Label	003A,0020	SH		ANAP		This is "RHYTHM" for the first group and "MEDIAN BEAT" for the second group.
>Channel Definition Sequence	003A,0200	SQ		ALWAYS		Sequence of one or more Items, with one Item per channel.
>>Channel Source Sequence	003A,0208	SQ		ALWAYS		Sequence of one or more Items which further qualify the Waveform Source.
>>>Code Value	0008,0100	SH		ANAP		This is the code for the lead
>>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "SCP"
>>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.3"
>>>Code Meaning	0008,0104	LO		ANAP		This is the lead name.
>>Channel Sensitivity	003A,0210	DS		ANAP		Nominal numeric value of unit quantity of sample
>>Channel Sensitivity Units Sequence	003A,0211	SQ		ANAP		A coded descriptor of the Units of measure for the Channel Sensitivity
>>>Code Value	0008,0100	SH		ANAP		This will be "uV"
>>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "UCUM"
>>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.4"
>>>Code Meaning	0008,0104	LO		ANAP		This will be "microvolt"
>>Channel Sensitivity Correction Factor	003A,0212	DS		ANAP		Multiplier to be applied to encoded sample values to mah units specified in Channel Sensitivity (003A,0210).
>>Channel Baseline	003A,0213	DS		ANAP		Offset of encoded sample value 0 from actual 0 using the units defined in the Channel Sensitivity Units Sequence (003A,0211). This will be "0".
>>Channel Sample Skew	003A,0215	DS		ANAP		Offset of first sample of channel from waveform multiplex group start time, in samples. This will be "0".
>>Waveform Bits Stored	003A,021A	US		ALWAYS		Number of significant bits within the waveform samples. This will be "16".
>>Filter Low Frequency	003A,0220	DS		ANAP		Nominal 3dB point of lower frequency of pass band
>>Filter High Frequency	003A,0221	DS		ANAP		Nominal 3dB point of higher frequency of pass band
>>Noh Filter Frequency	003A,0222	DS		ANAP		Center frequency of noh filter(s)
>Waveform Bits Allocated	5400,1004	US		ALWAYS		Size of each waveform data sample within the waveform data. This will be "16".
>Waveform Sample Interpretation	5400,1006	CS		ALWAYS		Data representation of the waveform data points. This will be "SS". "
>Waveform Data	5400,1010	OW/ OB		ALWAYS		Encoded data samples - channel multiplexed

Table 58: Waveform Annotation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Annotation Sequence	0040,B020	SQ		ALWAYS		Sequence of Annotation Items
>Measurement Units Code Sequence	0040,08EA	SQ		ANAP		Units of measurement. Coded entry sequence with one item only.
>>Code Value	0008,0100	SH		ANAP		This is the measurement unit designator. These are the possible values:
>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "UCUM".
>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.4".
>>Code Meaning	0008,0104	LO		ANAP		This is the text name of the measurement unit. These are the possible values:
>Concept Name Code Sequence	0040,A043	SQ		ANAP		Code representing the fully specified name of the NUMERIC measurement or CODED concept. This sequence shall contain exactly one item.
>>Modifier Code Sequence	0040,A195	SQ		ANAP		
>>>Code Value	0008,0100	SH		ANAP		This is the code for the marker. These are the possible values:
>>>Coding Scheme Designator	0008,0102	SH		ANAP		This will be "SCP".
>>>Coding Scheme Version	0008,0103	SH		ANAP		This will be "1.3".
>>>Code Meaning	0008,0104	LO		ANAP		This is the text name of the marker. These are the possible values:
>Referenced Waveform Channels	0040,A0B0	US		ANAP		List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).
> Temporal Range Type	0040,A130	CS		ALWAYS		
>Referenced Sample Positions	0040,A132	UL		ANAP	AUTO	List of samples within a multiplex group specifying temporal points for annotation. Position of first sample is 1. There will be only one sample position.
>Annotation Group Number	0040,A180	US		ANAP		Number identifying associated annotations. This will be "3".
>Numeric Value	0040,A30A	DS		ANAP		Numeric measurement value or values.
>Unformatted Text Value	0070,0006	ST		ANAP		Text Observation Value (annotation). (Statements)
Waveform Annotation Sequence	0040,B020	SQ		ALWAYS		Sequence of Annotation Items; one or more items shall be present.
> Annotation Group Number	0040,A180	US		ALWAYS		Number identifying associated annotations. This will be "0".
> Unformatted Text Value	0070,0006	ST		ALWAYS		Text Observation Value (annotation
> Referenced Waveform Channels	0040,A0B0	US		ALWAYS		List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).
> Annotation Group Number	0040,A180	US		ALWAYS		Number identifying associated annotations. This will be "1".
> Concept Code Name Sequence	0040,A043	SQ		ALWAYS		Code representing the fully specified name of the NUMERIC measurement or CODED concept. This sequence shall contain exactly one item.

>> Code Value	0008,0100	SH		ALWAYS		This is the code for the measurement. These are the possible values: VRate "5.10.2.5-1" RR Interval "5.10.2.1-3" PR Interval "5.13.5-7" QRS Duration "5.13.5-9" QT Interval "5.13.5-11" Q Interval "5.10.2.5-5" P Axis "5.10.3-11" QRS Axis "5.10.3-13" T Axis "5.10.3-15"
>> Coding Scheme Designator	0008,0102	SH		ALWAYS		"SCP".
>> Code Scheme Version	0008,0103	SH		ALWAYS		This will be "1.3".
>> Code Meaning	0008,0104	LO		ALWAYS		This is the text name of the measurement. These are the possible values: VRate "Ventricular Heart Rate" RR Interval "RR Interval" PR Interval "PR Interval" QRS Duration "QRS Duration" QT Interval "QT Interval" Q Interval "Q Interval" P Axis "P Axis" QRS Axis "QRS Axis" T Axis "T Axis"
> Numeric Value	0040,A30A	DS		ALWAYS		Numeric measurement value or values.
> Measurement Units Code Sequence	0040,08EA	SQ		ALWAYS		Units of measurement. Coded entry sequence with one item only.
>> Code Value	0008,0100	SH		ALWAYS		This is the measurement unit designator. These are the possible values: VRate "{H.B.}/min" RR Interval "ms" PR Interval "ms" QRS Duration "ms" QT Interval "ms" Q Interval "ms" P Axis "deg" QRS Axis "deg" T Axis "deg"
>> Coding Scheme Designator	0008,0102	SH		ALWAYS		This will be "UCUM".
>> Code Scheme Version	0008,0103	SH		ALWAYS		This will be "1.4".
>> Code Meaning	0008,0104	LO		ALWAYS		This is the text name of the measurement unit. These are the possible values: VRate "heart beats per minute" RR Interval "millisecond" PR Interval "millisecond" QRS Duration "millisecond" QT Interval "millisecond" Q Interval "millisecond" P Axis "degrees" QRS Axis "degrees" T Axis "degrees"
> Referenced Waveform Channels	0040,A0B0	US		ALWAYS		List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).
> Annotation Group Number	0040,A180	US		ALWAYS		Number identifying associated annotations. This will be "2".

Attribute Name	Tag	VR		Presence of Value		Comment
> Concept Code Name Sequence	0040,A043	SQ		ALWAYS		Code representing the fully specified name of the NUMERIC measurement or CODED concept. This sequence shall contain exactly one item.
>> Code Value	0008,0100	SH		ALWAYS		This is the code for the marker. These are the possible values: P Onset "5.10.3-1" P Offset "5.10.3-2" QRS Onset "5.10.3-3" Fiducial Point "5.7.1-3" QRS Offset "5.10.3-4" T Offset "5.10.3-5"
>> Coding Scheme Designator	0008,0102	SH		ALWAYS		This will be "SCP".
>> Code Scheme Version	0008,0103	SH		ALWAYS		This will be "1.3".
>> Code Meaning	0008,0104	LO		ALWAYS		This is the text name of the marker. These are the possible values: P Onset "P Onset" P Offset "P Offset" QRS Onset "QRS Onset" Fiducial Point "Fiducial Point" QRS Offset "QRS Offset" T Offset "T Offset"
> Referenced Sample Positions	0040,A132	UL		ALWAYS		List of samples within a multiplex group specifying temporal points for annotation. Position of first sample is 1. There will be only one sample position.
> Referenced Waveform Channels	0040,A0B0	US		ALWAYS		List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).
> Annotation Group Number	0040,A180	US		ALWAYS		Number identifying associated annotations. This will be "3".
> Concept Code Name Sequence	0040,A043	SQ		ALWAYS		Code representing the fully specified name of the NUMERIC measurement or CODED concept. This sequence shall contain exactly one item.
>> Code Value	0008,0100	SH		ALWAYS		This is the code for the marker. This will be "5.10.1.2".
>> Coding Scheme Designator	0008,0102	SH		ALWAYS		This will be "SCP".
>> Code Scheme Version	0008,0103	SH		ALWAYS		This will be "1.3".
>> Code Meaning	0008,0104	LO		ALWAYS		This is the text name of the marker. This will be "Pacemaker spike".
> Referenced Sample Positions	0040,A132	UL		ALWAYS		List of samples within a multiplex group specifying temporal points for annotation. Position of first sample is 1. There will be only one sample position.
> Referenced Waveform Channels	0040,A0B0	US		ALWAYS		List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).

Table 59: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	"ISO-IR-100"	ALWAYS		
Instance Creation Date	0008,0012	DA		ANAP		
Instance Creation Time	0008,0013	TM		ANAP		

SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.9.1.1	ALWAYS		Uniquely identifies the SOP Class. This will be the 12- Lead SOP Class "1.2.840.10008.5.1.4.1.1.9.1.1" or it will be the General SOP Class "1.2.840.10008.5.1.4.1.1.9.1.2" depending on the configuration settings.
SOP Instance UID	0008,0018	UI		ALWAYS		Uniquely identifies the SOP Instance. ST80i A.02 will generate this as: D prefix: 1.3.46.670589.32 Time Clock Random Number Suffix: 1
Instance Number	0020,0013	IS		ANAP		

Table 60: Additional Attributes Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Institution Residence	0038,0400	LO		ANAP		
Value Type	0040,A040	CS		ANAP		
Numeric Value	0040,A30A	DS		ANAP		
Visit Comments	0038,4000	LT		ANAP	User	User-defined comments about the visit
Reason for the Requested Procedure	0040,1002	LO		ANAP	User	Reason for requesting this imaging procedure

8.1.1.3.   Encapsulated PDF Storage SOP Class

Table 61: IOD of Created Encapsulated PDF Storage SOP Class Instances

Table 62: SOP Class Modules

Information Entity	Module	Presence
Patient	Patient Module	Always
Study	General Study Module	Always
	Patient Study Module	Conditional
	Clinical Trial Study Module	Conditional
Series	Encapsulated Document Series Module	Always
	Clinical Trial Series Module	Conditional
Equipment	General Equipment Module	Always
	SC Equipment Module	Always
Encapsulated Document	Encapsulated Document Module	Always
	SOP Common Module	Always

Table 63: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	MWL, USER	Patient's full name. (Patient First Name/Last Name
Patient ID	0010,0020	LO		VNAP	MWL, USER	Primary hospital identification number or code for the patient. (Patient ID
Issuer of Patient ID	0010,0021	LO		ANAP	MWL	
Issuer of Patient ID Qualifiers Sequence	0010,0024	SQ		ANAP	MWL	

Patient's Birth Date	0010,0030	DA		VNAP	MWL, USER	Birth date of the patient. (DateOfBirth)
Patient's Birth Time	0010,0032	TM		ANAP	MWL	
Patient's Sex	0010,0040	CS		VNAP	MWL	Sex of the named patient. Enumerated Values: "M" = Male, F=Female, O=Other
Other Patient IDs	0010,1000	LO		ANAP	MWL	
Other Patient Names	0010,1001	PN		ANAP	MWL	
Other Patient IDs Sequence	0010,1002	SQ		ANAP	MWL	
>Patient ID	0010,0020	LO		ALWAYS		
>Type of Patient ID	0010,0022	CS		ALWAYS		
Ethnic Group	0010,2160	SH		ANAP	MWL	
Patient Species Description	0010,2201	LO		ALWAYS	AUTO	
Patient Species Code Sequence	0010,2202	SQ		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS		
>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>Code Meaning	0008,0104	LO		ALWAYS		
Patient Breed Description	0010,2292	LO		ANAP	AUTO	
Patient Breed Code Sequence	0010,2293	SQ		VNAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS		
>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>Code Meaning	0008,0104	LO		ALWAYS		
Breed Registration Sequence	0010,2294	SQ		ANAP	AUTO	
>Breed Registration Number	0010,2295	LO		ALWAYS		
>Breed Registry Code Sequence	0010,2296	SQ		ALWAYS		
>>Code Value	0008,0100	SH		ALWAYS		
>>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>>Code Meaning	0008,0104	LO		ALWAYS		
Responsible Person	0010,2297	PN		VNAP	AUTO	
Responsible Person Role	0010,2298	CS		ALWAYS	AUTO	
Responsible Organization	0010,2299	LO		VNAP	AUTO	
Patient Comments	0010,4000	LT		ANAP	MWL	
Patient Identity Removed	0012,0062	CS		ANAP	AUTO	
De-identification Method	0012,0063	LO		ANAP	AUTO	
De-identification Method Code Sequence	0012,0064	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS		
>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>Code Meaning	0008,0104	LO		ALWAYS		

Table 64: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO, MWL	Date the Study started (Acquisition Date – output only)
Study Time	0008,0030	TM		VNAP	AUTO, MWL	Time the Study started (Acquisition Time – output only)
Accession Number	0008,0050	SH		VNAP	AUTO, MWL	A number that identifies the order for the study (Order Number)
Issuer of Accession Number Sequence	0008,0051	SQ		ANAP	AUTO,	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
					MWL	
Referring Physician's Name	0008,0090	PN		VNAP	MWL	Name of the patient's referring physician. (Referring Doctor Name)
Referring Physician Identification Sequence	0008,0096	SQ		ANAP	MWL	
>Person Identification Code Sequence	0040,1101	SQ		ALWAYS		
>>Code Value	0008,0100	SH		ALWAYS		
>>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>>Code Meaning	0008,0104	LO		ALWAYS		
Study Description	0008,1030	LO		ANAP	AUTO, MWL	Institution-generated description or classification of the Study (component) performed. (Test Reason)
Physician(s) of Record	0008,1048	PN		ANAP	AUTO	
Physician(s) of Record Identification Sequence	0008,1049	SQ		ANAP	AUTO	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	AUTO	
Physician(s) Reading Study Identification Sequence	0008,1062	SQ		ANAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	Unique identifier for the Study. For MWL, or generated by ST 80i using: D prefix: 1.3.46.670589.32 Time Clock Random Number
Study ID	0020,0010	SH		VNAP	AUTO, MWL	User or equipment generated Study identifier. For output this will be blank.
Requesting Service Code Sequence	0032,1034	SQ		ANAP	AUTO	
Reason For Performed Procedure Code Sequence	0040,1012	SQ		ANAP	AUTO	

Table 65: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		ANAP	AUTO	
Admitting Diagnoses Code Sequence	0008,1084	SQ		ANAP	AUTO	
Patient's Age	0010,1010	AS		ANAP	MWL, USER	Age of the Patient. (Age)
Patient's Size	0010,1020	DS		ANAP	MWL, USER	Length or size of the Patient, in meters. (Height)
Patient's Size Code Sequence	0010,1021	SQ		ANAP	AUTO	
Patient's Weight	0010,1030	DS		ANAP	MWL, USER	Weight of the Patient, in kilograms. (Weight)
Occupation	0010,2180	SH		ANAP	MWL	
Additional Patient History	0010,21B0	LT		ANAP	AUTO	
Patient's Sex Neutered	0010,2203	CS		VNAP	AUTO	
Admission ID	0038,0010	LO		ANAP	AUTO, MWL	Identification number of the visit as assigned by the healthcare provider.
Issuer of Admission ID Sequence	0038,0014	SQ		ANAP	AUTO	
Service Episode ID	0038,0060	LO		ANAP	AUTO	
Service Episode Description	0038,0062	LO		ANAP	AUTO	

Issuer of Service Episode ID Sequence	0038,0064	SQ		ANAP	AUTO	

Table 66: Clinical Trial Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Clinical Trial Time Point ID	0012,0050	LO		VNAP	AUTO	
Clinical Trial Time Point Description	0012,0051	ST		ANAP	AUTO	
Consent for Clinical Trial Use Sequence	0012,0083	SQ		ANAP	AUTO	

Table 67: Encapsulated Document Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO, MWL	
Series Description	0008,103E	LO		ANAP	AUTO	
Series Description Code Sequence	0008,103F	SQ		ANAP	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO	

Table 68: Clinical Trial Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Clinical Trial Coordinating Center Name	0012,0060	LO		VNAP	AUTO	
Clinical Trial Series ID	0012,0071	LO		ANAP	AUTO	
Clinical Trial Series Description	0012,0072	LO		ANAP	AUTO	

Table 69: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	VNAP	AUTO	Philips Medical Systems
Institution Name	0008,0080	LO	If the institution name in MWL is empty, the local institution name is used.	ANAP	AUTO, MWL	Institution where the equipment that produced the composite instances is located. (Institution Name)
Institution Address	0008,0081	ST		ANAP	AUTO, MWL	
Station Name	0008,1010	SH	Value is empty	ANAP	AUTO	User defined name identifying the machine that produced the composite instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						(Cart ID)
Institutional Department Name	0008,1040	LO		ANAP	AUTO	Department in the institution where the equipment that produced the composite instances is located. (Department Name)
Manufacturer's Model Name	0008,1090	LO	According to different type. 80315 (70) 80310 (50) 80306 (30/20)	ANAP	AUTO	Manufacturer's model name of the equipment that produced the composite instances (Cart Model)
Device Serial Number	0018,1000	LO		ANAP	AUTO	Manufacturer's serial number of the equipment that produced the composite instances. (Cart Serial Num)
Gantry ID	0018,1008	LO		ANAP	AUTO	
Software Versions	0018,1020	LO	A.02.00	ANAP	AUTO	Manufacturer's designation of software version of the equipment that produced the composite instances. (Cart Version)
Spatial Resolution	0018,1050	DS		ANAP	AUTO	
Date of Last Calibration	0018,1200	DA		ANAP	AUTO	
Time of Last Calibration	0018,1201	TM		ANAP	AUTO	
Pixel Padding Value	0028,0120	US/SS		ANAP	AUTO	

Table 70: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ANAP	AUTO, MWL	
Conversion Type	0008,0064	CS		ALWAYS	AUTO	
Secondary Capture Device ID	0018,1010	LO		ANAP	AUTO	
Secondary Capture Device Manufacturer	0018,1016	LO		ANAP	AUTO	
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ANAP	AUTO	
Secondary Capture Device Software Versions	0018,1019	LO		ANAP	AUTO	
Video Image Format Acquired	0018,1022	SH		ANAP	AUTO	
Digital Image Format Acquired	0018,1023	LO		ANAP	AUTO	

Table 71: Encapsulated Document Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		VNAP	AUTO	
Acquisition DateTime	0008,002A	DT		VNAP	AUTO	
Content Time	0008,0033	TM		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Image Laterality	0020,0062	CS		ANAP	AUTO	

Burned In Annotation	0028,0301	CS			ALWAYS	AUTO
Recognizable Visual Features	0028,0302	CS			ANAP	AUTO
Concept Name Code Sequence	0040,A043	SQ			VNAP	AUTO
Verification Flag	0040,A493	CS			ANAP	AUTO
HL7 Instance Identifier	0040,E001	ST			ALWAYS	AUTO
Document Class Code Sequence	0040,E008	SQ			ANAP	AUTO
Document Title	0042,0010	ST			VNAP	AUTO
Encapsulated Document	0042,0011	OB			ALWAYS	AUTO
MIME Type of Encapsulated Document	0042,0012	LO			ALWAYS	AUTO
Source Instance Sequence	0042,0013	SQ			ALWAYS	AUTO
List of MIME Types	0042,0014	LO			ALWAYS	AUTO

Table 72: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO-IR-100	ALWAYS	AUTO, USER	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
Instance Creator UID	0008,0014	UI		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.104.1	ALWAYS	AUTO	Uniquely identifies the SOP Class. This will be the 12- Lead ECG SOP Class "1.2.840.10008.5.1.4.1.1.9.1.1" or it will be the General ECG SOP Class "1.2.840.10008.5.1.4.1.1.9.1.2" depending on the configuration settings
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	Uniquely identifies the SOP Instance. ST 80i will generate this as: DECG prefix: 1.3.46.670589.32 Time Clock Random Number Suffix: 1
Related General SOP Class UID	0008,001A	UI		ANAP	AUTO	
Original Specialized SOP Class UID	0008,001B	UI		ANAP	AUTO	
Coding Scheme Identification Sequence	0008,0110	SQ		ANAP	AUTO	
Timezone Offset From U	0008,0201	SH		ANAP	AUTO	
Contributing Equipment Sequence	0018,A001	SQ		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	
Longitudinal Temporal Information Modified	0028,0303	CS		ANAP	AUTO	
HL7 Structured Document Reference Sequence	0040,A390	SQ		ALWAYS	AUTO	
SOP Instance Status	0100,0410	CS		ANAP	AUTO	
SOP Authorization DateTime	0100,0420	DT		ANAP	AUTO	
SOP Authorization Comment	0100,0424	LT		ANAP	AUTO	
Authorization Equipment Certification Number	0100,0426	LO		ANAP	AUTO	
Encrypted Attributes Sequence	0400,0500	SQ		ALWAYS	AUTO	

Original Attributes Sequence	0400,0561	SQ		ANAP	AUTO	
MAC Parameters Sequence	4FFE,0001	SQ		ANAP	AUTO	
Digital Signatures Sequence	FFFA,FFFA	SQ		ANAP	AUTO	

8.1.2.   Usage of Attributes from Received IOD

Not applicable.

8.1.3.   Attribute Mapping

Not applicable

8.1.4.   Coerced/Modified fields

Not applicable

8.2.   Data Dictionary of Private Attributes

Not applicable

8.3.   Coded Terminology and Templates

Not applicable.

8.3.1.   Context Groups

Not applicable

8.3.2.   Template Specifications

Not applicable

8.3.3.   Private code definitions

Not applicable

8.4.   Grayscale Image consistency

Not applicable

8.5.   Standard Extended/Specialized/Private SOPs

Not applicable

8.6.   Private Transfer Syntaxes

Not applicable