SIEMENS

SONOVISTA FX™ Ultrasound System

DICOM Conformance Statement

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CONFORMANCE STATEMENT OVERVIEW

The **SONOVISTA FX TM Ultrasound System** supports the following DICOM Application Entities:

- Verification
  - Verification AE
- Transfer
  - Storage AE
  - Storage Commitment AE
- Workflow Management
  - Worklist AE
  - MPPS AE
- Print Management
  - Print AE

Table 1: Network Services

SOP Classes	Service Class User (SCU)	Service Class Provider (SCP)
VERIFICATION		
Verification AE		
Verification	Yes	Yes
TRANSFER		
Storage AE		
Ultrasound Image Storage (Retired)	Yes	Yes
Ultrasound Image Storage	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
Comprehensive SR	Yes	Yes
Storage Commitment AE		
Storage Commitment Push Model	Yes	No
WORKFLOW MANAGEMENT		
Worklist AE		
Modality Worklist	Yes	No
MPPS AE		
Modality Performed Procedure Step	Yes	No
PRINT MANAGEMENT		
Print AE		
Basic Grayscale Print Management Meta SOP Class	Yes	No
Basic Color Print Management Meta SOP Class	Yes	No
Basic Grayscale Image Box SOP Class	Yes	No
Basic Color Image Box SOP Class	Yes	No
Print Job SOP Class	Yes	No

Table 2: UID Values

SOP Class Name	SOP Class UID	Category
Verification AE		

SOP Class Name	SOP Class UID	Category
Verification	1.2.840.10008.1.1	Verification
Storage AE		
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Transfer
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Transfer
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Transfer
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Transfer
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Transfer
Storage Commitment AE		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Transfer
Worklist AE		
Modality Worklist	1.2.840.10008.5.1.4.31	Workflow Management
MPPS AE		
Modality Performed Procedure Step	1.2.840.10008. 3.1.2.3.3	Workflow Management
Print AE		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Print Management
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Print Management
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Print Management
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Print Management
Print Job SOP Class	1.2.840.10008.5.1.1.14	Print Management

The ISO Images generated by the FX may be used to realize real DICOM Profiles (See DICOM PS3.11). These Profiles shall be described in Chapter 5. The supported Profiles are listed in the table below.

Table 3: MEDIA Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
DVD—Recordable		
STD-US-ID-SF-DVD	Yes	Yes
STD-US-SC-SF-DVD	Yes	No
Compact Disk—Recordable		
STD-US-ID-SF-CDR	Yes	Yes
STD-US-SC-SF-CDR	Yes	No

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1.0 Purpose

This document describes the conformance to the ACR-NEMA DICOM 3.0 Standard by the SONOVISTA FX ultrasound system software version 1.0 from Siemens Medical Solutions USA, Inc. Ultrasound Division. It shall establish the conformance specifications for this system only, and does not apply to other products offered by Siemens Medical Solutions USA, Inc., or its affiliates.

The SONOVISTA FX is a device that generates ultrasound images that can be sent using DICOM standard protocols and definitions to other DICOM compliant devices that support SOP classes as defined in Table 2 in this document.

1.1 Scope

The DICOM standard provides a well-defined set of structures and protocols that allow inter-operability to a wide variety of medical imaging devices.

When configured with the DICOM option, the SONOVISTA FX systems provide support for essential services related to ultrasound scanning and connectivity to DICOM compliant devices. SONOVISTA FX system products will not support all features supported by the DICOM standard. This document clearly states the DICOM services and data classes that are supported by the applications included with the SONOVISTA FX. The intent of this document is to allow users and other vendors who also conform to the DICOM standard to exchange information within the specific context of those elements of the DICOM standard that SONOVISTA FX system supports.

This document is written with respect to the adopted portions of the DICOM standard, Revision 3. The following sections of this document follow the outline specified in the DICOM Standard NEMA publication PS3.2.[1]

2.0 Definitions

The following table provides a list of terms, their acronyms (if applicable), and their descriptions.

Table 4: Terms, Acronyms, and Descriptions

Term	Acronym	Description
American College of Radiology - National Electrical Manufacturer's Association	ACR-NEMA	The American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA) formed a joint committee to develop a standard for Digital Imaging and Communications in Medicine (DICOM).
Application Entity	AE	An application that supports DICOM communication with other DICOM applications.

[1] Second part of the DICOM standard: NEMA Standards Publication PS 3.2-2008, Digital Imaging and Communications in Medicine (DICOM), Part 2: Conformance

DICOM Conformance Statement	DCS	A formal statement associated with a specific implementation of the DICOM Standard. It specifies the Service Classes, Information Objects, Communications Protocols and Media Storage Application Profiles supported by the implementation.
DICOM Message Service Element	DIMSE	Defines an Application Service Element (both the service and protocol) used by peer DICOM Application Entities for the purpose of exchanging medical images and related information.
Digital Imaging and Communications in Medicine, Version 3.0	DICOM 3.0	A well-defined set of structures and protocols that allow inter-operability to a wide variety of medical imaging devices.
Ethernet	-	Network methodology devised in 1976 by Digital Equipment Corporation, Intel and Xerox which is the most common in practice today. Ethernet is the IEEE standard 802.3
Information Object Definition	IOD	A data abstraction of a class of similar Real-World Objects which defines the nature and attributes relevant to the class of Real-World objects represented.
Integrating the Healthcare Enterprise	IHE	An initiative sponsored by the Radiological Society of North America (RSNA) to document and demonstrate standards-based methods of sharing information in support of optimal patient care. For additional information see www.rsna.org/ihe.
Picture Archiving and Communications Systems	PACS	A DICOM server that accepts medical images from another DICOM system and stores the images for later retrieval.
Protocol Data Unit	PDU	The PDUs are message formats exchanged between peer entities within a layer. A PDU shall consist of protocol control information and user data.
Real-World Activity	RWA	That which exists in the real world which pertains to specific area of information processing within the area of interest of the DICOM Standard. Such a Real-World Activity may be represented by one or more computer information metaphors called SOP Classes.
Request	RQ	A request from one DICOM AE for service from another DICOM AE

Response	RSP	A response from one DICOM AE to the request for service from another DICOM AE
Service Class Provider	SCP	The role played by a DICOM Application Entity (DIMSE-Service-User) which performs operations and invokes notifications on a specific Association.
Service Class User	SCU	The role played by a DICOM Application Entity (DIMSE-Service-User) which invokes notifications and performs operations on a specific Association.
Service-Object Pairs	SOP	The union of a specific set of DIMSE Services and one related Information Object Definition which completely defines a precise context for communication.
Structured Report	SR	Also called Procedure Report. A DICOM object which contains measurement, calculations, diagnoses, image references and other information concerning a patient exam.
Unique identifier	UID	A series of digits and periods (.) used to uniquely identify an object such as an Ultrasound image in DICOM.
VA Hospital Information System Technology Architecture DICOM Conformance Requirements	VISTA	DICOM requirements document of the US Department of Veteran's Affairs (VA) Hospital Information System Technology Architecture. For additional information see www.va.gov/imaging.

3.0 Implementation Model

SONOVISTA FX system users can store images and other data directly on the SONOVISTA FX system hard disk. Images and structured reports can be exported to a DICOM archive server or workstation on a network. In the following sections, SONOVISTA FX system Real World Activities are indicated by "Real World Activity" name while "FX AE" indicates the invoked Application Entity. Similarly, the activities associated with service providers are indicated as "Real World Service Activity."

3.1 Application Dataflow diagram

Figure 1 illustrates the SONOVISTA FX system's Application Entity (AE), which is shown in the box. Relationships between user invoked activities (in the circles at the left of the AE) and the DICOM services (depicted in the circles at the right of the AE)

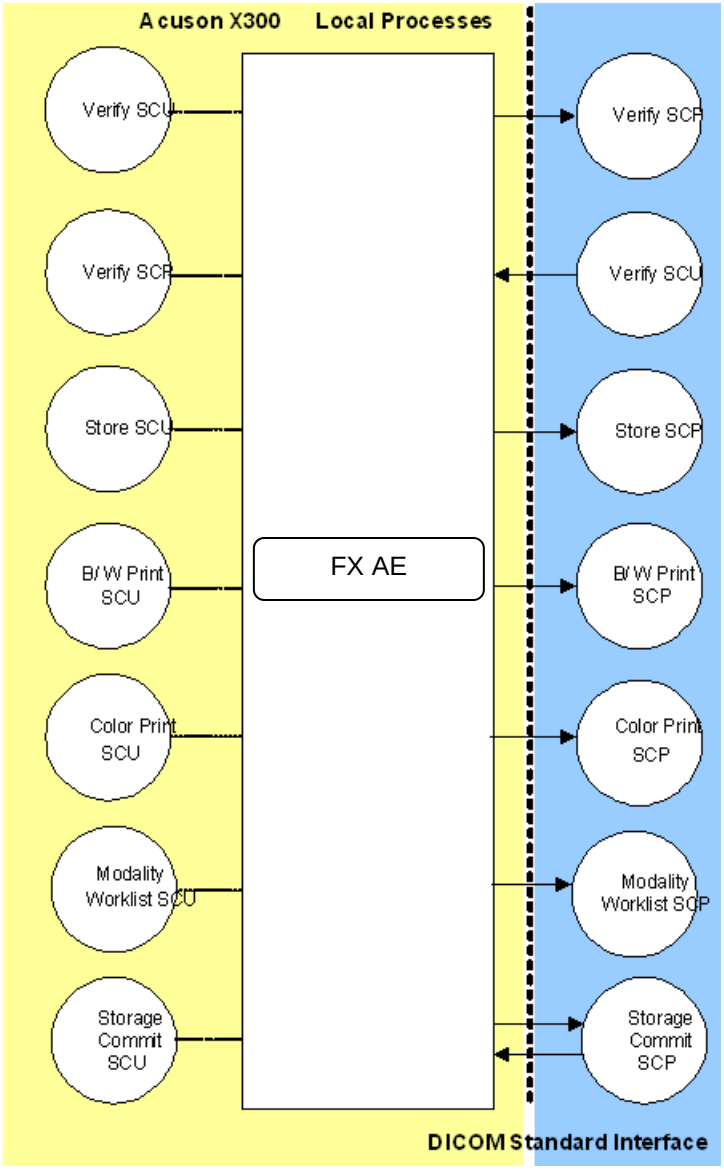


Figure 1. Implementation Model

3.1.1 Verification

Verification is a part of the DICOM configuration located on the 'DICOM' page of the System Presets. Verification can be used to send a DICOM Verification request to a remote Application Entity (AE) and listen for a response.

When used as a diagnostic tool, Verification returns the following messages to the user:

- If the verification succeeds: "DICOM - Successfully contacted system"
- If the verification fails: "DICOM - Unable to communicate with system"

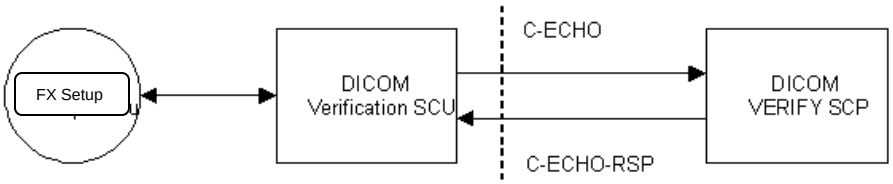


Figure 2. Verification Model.

3.1.2 DICOM Store

When requested, the SONOVISTA FX sends images and/or structured reports to the preconfigured DICOM Storage server.

DICOM Store can be seen as two sub-operations:

- queueing images and/or structured reports for transfer
- Transferring images and/or structured reports to the storage server.

Queuing images and structured reports for transfer:

SONOVISTA FX can be configured to automatically queue up images and structured reports for transfer as they are being created. “AutoStore to DICOM” option in DICOM presets has to be set for this.

Alternatively, user can select exams or individual images and manually queue them up from Review mode. When an exam is selected for DICOM store all images and structured reports (generally zero or one) will be queued. Structured reports can’t be selected individually for store; the entire exam must be stored.

Transfer of images and structured reports to the storage server:

Further, once images and/or structured reports are queued they may be immediately transferred or delayed till the end of study using the transfer storage configuration.

SONOVISTA FX supports two storage configurations: “Store At End of Exam” and “Store During Exam”.

If the storage configuration is set to “Store At End of Exam” transfer attempts begin when the user selects “Close Study” or “New Patient”.

If the storage configuration is set to “Store during Exam”, transfer attempts to destination devices begin immediately after they are queued.

For both “Store At End of Exam” and “Store During Exam” settings, image and/or structured report transfer will be delayed if the SONOVISTA FX is busy performing another DICOM Store operation.

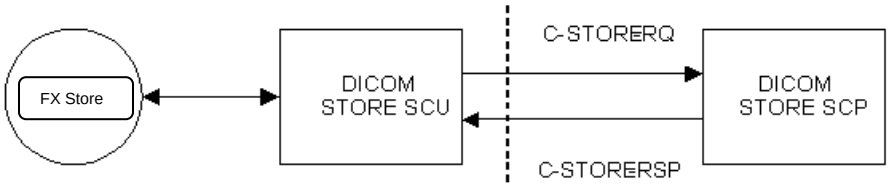


Figure 3. Store Model.

3.1.3 DICOM Print

SONOVISTA FX system is capable of grayscale (B/W) and color printing.

When requested, single frame images will be printed to a pre-configured DICOM network printer.

DICOM Print can be seen as two sub-operations:

- paging images for transfer
- transferring pages to printer

Paging images for transfer:

SONOVISTA FX can be configured to automatically queue up images to be printed on B/W Printer and/or Color printer as they are being created.

Alternatively, user can select exams or individual images and manually queue them up from Review mode for print.

Every image queued up is added into a page in the respective printer layout (DICOM B/W Printer Layout or DICOM Color Printer Layout).

Transfer of pages to the Printer:

Further, pages may be immediately transferred to the printer or delayed till the end of study based on the transfer configuration.

SONOVISTA FX supports two configurations: “Print At End of Exam” and “Print When Page Full”.

If the configuration is set to “Print At End of Exam,” transfer attempts of all pages to the destination DICOM printer begin as a batch when the user ends the exam.

If the configuration is set to “Print When Page Full”, transfer attempt of a page to the destination DICOM printer begins as soon as it becomes full.

For both “Print At End of Exam” and “Print when page full” settings, page transfer will be delayed if the SONOVISTA FX is busy performing another DICOM Print operation.

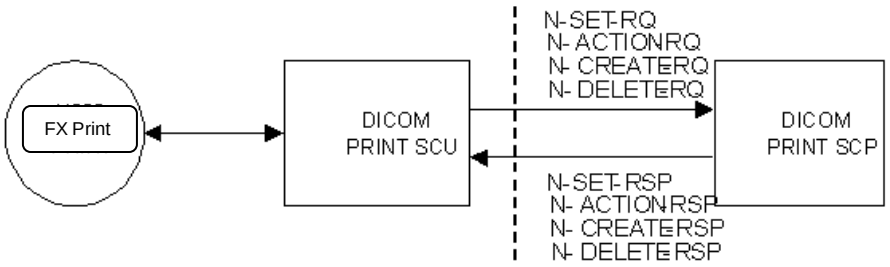


Figure 4. Print Model.

3.1.4 Patient Registration using Worklist

Patient registration can be automated by using the 'Worklist' Real World Activity. Pressing the 'New Patient' key on the keyboard initiates the patient data registration process and closes the previous active study, and invokes the Worklist query screen when Worklist option is availible. The Worklist query screen can also be initiated from the Study screen.

Pressing the 'Search' button will attempt to find all matching patient data using the information entered on the Worklist Query screen. Patient name fields that are partially filled or empty will be treated as though an implicit wildcard was appended at the end of each field. Patient ID and Requested Procedure ID and Accession number will be exact match only. If no matches are found, a message will be presented to the operator indicating so. If more that one matching patient is found, a pick list of patient procedures will be presented to the user to select from. Each of the fields will be sortable in ascending and descending order.

The pick list of patient procedures will be limited to a number of preset entries. If more than this number of matching records are found in the query, the search will terminate and a the user will be notified. The search list criteria will contain:

- Patient name
- Patient ID
- Accession number
- Exam start date/time range
- Requested Procedure ID
- US/All modalities
- Scheduled station AE title

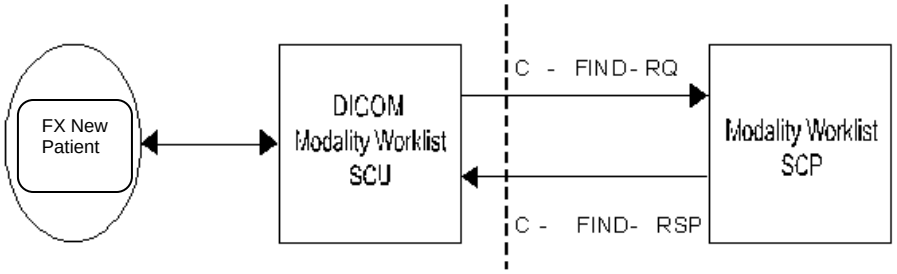


Figure 5. Modality Worklist Model

Once a Worklist query is initiated, a “Retrieving worklist, please wait ...” dialog will be presented to the user. The user will only have one option, “Cancel,” which will abort the query operation.

The following data fields in Modality Worklist Screen are initially populated from the New Patient Screen, if filled in, and can be used for query:

Attribute Name	Tag
Patient’s Full Name	(0010,0010)
Patient ID	(0010,0020)
Accession Number	(0008,0050)

The following data fields will be populated on the worklist screen for each return:

Attribute Name	Tag
Patient's Full Name	(0010,0010)
Patient ID	(0010,0020)
Accession Number	(0008,0050)
Exam Start Date/Time	(0040,0002), (0040,0003)
Scheduled Procedure Step Sequence	(0040,0100)*
>Scheduled Procedure Step Description	(0040,0007)
>Scheduled Protocol Code Sequence	(0040,0008)
>>Code Value	(0008,0100)
Requested Procedure Description	(0032,1060)
Exam Type	(0008,1030)**
*<code1>, …,<codeN>: <sched1>,…,<schedn> where: code<i> = Sequence item code value(0008,0100) for a given sequence or value multiplicity sched<i> = Scheduled procedure step(0040,0007) for a given sequence or value multiplicity	
**if a value exists for (0008,1030). Otherwise, Exam Type is set to value of Scheduled procedure step (0040,0007). If (0040,0007) is also empty, Exam Type is set to Requested procedure Description (0032,1060) if it exists.	

The user will have the option to select a patient procedure step, or cancel the operation. Selection of a procedure step from the list will cause demographic information for the patient to be loaded in to the patient data fields.

The following data fields will be populated on the patient data screen:

Attribute Name	Tag
Patient Name (first,middle,last)	(0010,0010)
Patient ID	(0010,0020)
Accession number	(0008,0050)

Attribute Name	Tag
Exam start date/time	(0040,0002), (0040,0003)
DOB	(0010,0030)
Sex	(0010,0040)
Weight	(0010,1030)
Height	(0010,1020)
Physician	(0008,0090)
Indication	(0080,1080)
LMP	(0010,21D0)

3.1.5 Modality Performed Procedure Step

The SONOVISTA FX System supports reporting of Modality Performed Procedure Step (MPPS) orders when the patient registration process utilizes the 'Worklist' Real World Activity. Procedure steps are presented to the operator after successful query of a server that supports the MPPS option. A detail window allows the operator access to individual scheduled procedure steps. Pressing the 'Procedures' push button on the Review Screen actualizes the detail window when multiple procedure steps are listed for the patient.

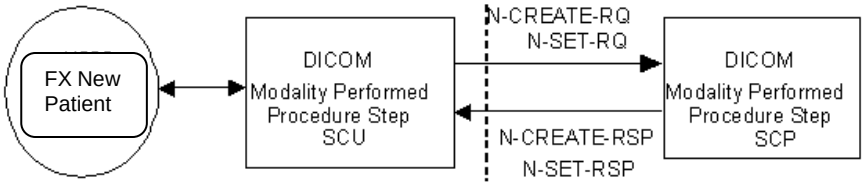


Figure 6. MPPS Model

3.1.6 Removable Media Storage

The SONOVISTA FX can perform DICOM operations to its standard on-board 120mm CD/DVD disk drive.

The SONOVISTA FX performs the File Set Creator and File Set Reader Roles for CD and DVD disks. The File Set Reader functionality does not support import of DICOM Structured Reports or measurements of imported images. Both limitations are overcome when DICOM and TIFF/AVI format is exported to CD/DVD. A DICOM conforming CD/DVD media is created when the user saves studies in DICOM format to the CD/DVD. A DICOM 3.0 conforming DICOMDIR file is created together with the directory structures, image files and structured reports (if any exist).

3.1.7 Storage Commitment

The user can exercise the Storage Commitment option by configuring and selecting a Storage Commitment server from the DICOM Presets menu. The SONOVISTA FX system requests commitment

of images and structured reports (if any exist) and upon successful acknowledgment from the Storage server marks the study on the system hard drive as 'Archived'.

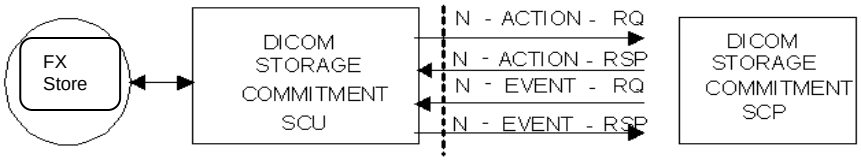


Figure 7. Storage Commitment Model

3.2 AE Functional Definition

3.2.1 Verification Real-World Activities

The SONOVISTA FX application entity performs Verification Service Class as an SCU and SCP allowing the operator to verify the ability of an application on a remote device to receive DICOM messages and allowing the operator of a remote DICOM device to verify the SONOVISTA FX system's ability to receive DICOM messages. (C-ECHO DIMSE)

3.2.2 Store Real-World Activities

The SONOVISTA FX Application Entity (AE) performs all of the functions to transmit ultrasound images, structured reports and associated data to network servers or workstations. The SONOVISTA FX AE supports the Ultrasound Image, Ultrasound Multi-Frame Image (only for 3D data), Ultrasound Image (Retired), and Secondary Capture storage SOP classes SOP classes as an SCU.

The SONOVISTA FX AE also supports Structured Reports, for Obstetric-GYN, Vascular and Cardiac studies, using the Comprehensive SR SOP Class as an SCU.

The SONOVISTA FX AE initiates an association for C-STORE Requests to store providers when the user invokes "DICOM Store". The association may be used to store multiple images~~, clips~~ and structured reports and is closed when no images or structured reports are available to be stored to the remote device for five seconds.

3.2.3 Storage Commitment - Push Model Real-World Activities

The SONOVISTA FX AE supports Storage Commitment Push Model SOP class to inform servers when all the store operations for a study have been completed. The Storage Commitment SCU uses the N-ACTION primitive to request safekeeping of a set of SOP Instances. The Storage Commitment SCU also processes the N-EVENT-REPORT primitives that are received from the SCP indicating 'successful' or 'non-successful' commitment status. The N-EVENT-REPORT information is used to mark a study as being successfully archived to a DICOM SCP.

The successful commit status and archival indication on the FX does not ensure permanent archival of the images and Structured Reports. The operations performed by the SCP are dependent on its capabilities and configuration.

3.2.4 Print Real-World Activities

The SONOVISTA FX AE provides all aspects of the Print Management SCU. The SONOVISTA FX AE initiates an association to the printer when the user invokes "DICOM Print". The association may be used to print multiple pages and is closed when no pages are available to be printed to the remote device for five seconds.

3.2.5 Modality Worklist Real-World Activities

The SONOVISTA FX AE supports the DICOM Basic Worklist Management Service as an SCU. The AE initiates an association to the active Worklist server when a Worklist query is selected (via the “Worklist” button). The association is closed upon the completion of each query. A preset maximum number of matching results is accepted, at which point, the SONOVISTA FX AE issues a C-CANCEL-RQ request.

3.2.6 Modality Performed Procedure Step Real-World Activities

The SONOVISTA FX AE supports Modality Performed Procedure Step (MPPS) in the role of SCU. The SONOVISTA FX is capable of displaying scheduled procedure steps via the User Interface (UI) for Modality Performed Procedure Step. The operator can select single PPS. The operator can notify the MPPS server that a MPPS is ‘In Progress’, ‘discontinued’ or ‘Completed’. The user is also allowed to append procedure steps to existing or previously completed procedure steps.

3.2.7 Removable Media Storage Real-World Activities

The SONOVISTA FX AE provides a standard implementation of DICOM Store to CD or DVD. The SONOVISTA FX AE selects one or more studies and exports the same to CD or DVD. SONOVISTA FX AE creates a DICOM File Format Image File for every image and structured report in each of the selected studies.

A DICOMDIR file is created along with the files.

Measurements are not supported on imported images unless TIFF/AVI format is exported.

The DICOM SR cannot be imported from media unless the TIFF/AVI format is exported along with the DICOM SR.

3.2.8 Sequencing of Real-World Activities

Print, Store, Echo, Worklist, Storage Commit and MPPS commands can be transmitted simultaneously within the limits described below.

Storage Commit

The Storage Commitment (if enabled) command is sent in the following situations:

a. On series close, when all images have previously stored successfully.

b. The series is closed before all images are stored successfully, all previous stores have succeeded and the last image stores successfully.

c. The series is closed before all images are stored successfully, at least one store has succeeded, at least one store has failed and the last store with non-zero retry count fails or succeeds.

d. A series has been partially committed as in c. Later, due to "Retry Job” button press on the Store Status UI screen the store jobs are retried. Another Storage Commit is sent when at least one store has succeeded and the last store with non-zero retry count fails or succeeds.

MPPS

The MPPS (if enabled) command is sent in the following situations:

a. N-CREATE command is sent whenever a new procedure step is selected or an unscheduled procedure is created on the system. The state of the MPPS command is set to “In-Progress”.

b. N-SET command is sent when the Procedure Step is closed by the user pressing either the Completed or Discontinued button on the Close Procedure dialog. The state of the MPPS command is set, according to the state (Completed or Discontinued) set by the user.

4.0 AE Specifications

The following specifications apply to the SONOVISTA FX AE as depicted in Figure 1.

4.1 SONOVISTA FX AE Specification

The SONOVISTA FX AE provides conformance to the following DICOM Service SOP Classes as an SCU.

Table 5: Supported SOP Classes

Service SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-Frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Storage Commitment - Push Model	1.2.840.10008.1.20.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.16
Modality Worklist Information Model C- FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33

4.2 Association Establishment Policies

4.2.1 General

The SONOVISTA FX system utilizes TCP/IP. The Maximum Length PDU negotiation is included in all association establishment requests. The maximum length PDU offered for an association initiated by SONOVISTA FX is:

- Maximum PDU Offered: 28672

4.2.2 Association Establishment Order

SONOVISTA FX initiates each C-Store Request one at a time, one for each transfer request being processed.

Image format on SONOVISTA FX can be set to one of “Automatic”, “Old Ultrasound” or “Secondary Capture”.

For the “Automatic” setting, SONOVISTA FX proposes Ultrasound Multi-Frame Image (only for 3D data), Ultrasound Image, Ultrasound Image (Retired), Secondary Capture Image and Comprehensive SR sequentially.

For the “Old Ultrasound” setting, SONOVISTA FX proposes Ultrasound Image (Retired), Secondary Capture and Comprehensive SR Image to be negotiated sequentially.

For the “Secondary Capture” setting, SONOVISTA FX proposes Secondary Capture Image and Comprehensive SR to be negotiated sequentially.

4.2.3 Asynchronous Nature

All associations use the default synchronous mode of operation. Asynchronous Operations Window negotiations are not supported on the SONOVISTA FX system.

4.2.4 Implementation Identifying Information

- Implementation Class UID: “1.3.12.2.1107.5.5.5” (See below).
- Implementation Version Name: “MergeCOM3_351”

Siemens has provided registration for all Siemens Medical Solutions Groups. This unique Class UID is defined as:

“1.3.12.2.1107.5.5.product”

Where the interpretation is:

1. = International Standards Organization (ISO)

3. = International branch of ISO

12.2.1107.5. = Assigned to Siemens-UB MED

5. = Ultrasound Modality (SMS-UG)

Product = 5 - DICOM implementation for SONOVISTA FX.

4.3 Association Initiation by Real-World Activities

4.3.1 Real World Activity – Verification

The SONOVISTA FX is capable of supporting Verification service class as SCU or SCP. Verification can be initiated as a singular event from the Systems Presets menu to any configured SCP that supports Verification.

Proposed Presentation Contexts – Verification

The SONOVISTA FX will propose Presentation contexts as shown in table 3.

Table 6: Verification Presentation Context.

Abstract Syntax	Transfer Syntax	Role	Extended

Name	UID	Name List	UID List		Negotiation
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU/SCP	None
Verification	1.2.840.10008.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU/SCP	None
Verification	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU/SCP	None

4.3.2 Real World Activity – Store

SONOVISTA FX facilitates users to store images and structured reports as they are being created or later in review mode.

Queuing images during acquisition

"Autostore to DICOM" option in DICOM presets has to be set. One or more of programmable key on the control panel can be configured for Store (Disk Store). When the user presses one of the configured keys, an image is acquired, stored on the hard disk and queued up to be transferred to the storage server. Structured reports, if any, will be stored automatically after the study is closed and each time the report is modified after study close.

Queueing images and structured reports in Review mode

User can select one or more closed studies and queue them up for Storage. The DICOM Store button is available in Review screen for this operation. All images and structured reports (if any) are stored. The study must be closed to generate a structured report.

Transfer of images to the storage server

See section 3.1.2

Associated Real World Activities

When images and/or structured reports are transferred from the hard disk to a DICOM Store SCP, the system establishes an association between the SONOVISTA FX AE and the configured DICOM device. The association may be used to store multiple images and/or structured reports and is closed when no images or structured reports are available to be stored to the remote device for five seconds.

Proposed Presentation Context

The following Presentation Contexts are presented to the SCP in an A-ASSOCIATE-RQ for DIMSE C-STORE storage services. The storage services utilize C-STORE services, as defined by the DICOM Standard. Table 4 represents all "Store" presentation contexts.

Table 7: Store Presentation Context

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Ultrasound Multi-Frame Image Storage (only for 3D)	1.2.840.10008.5.1.4.1.1.3.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

The SONOVISTA FX always acts as an SCU for store and is the client in a client-server model.

SOP Specific Conformance to Storage Service SOP Classes

The Store Real World Activity provides standard extended conformance as an SCU for the following standard Storage Service Class SOP:

Table 8: Supported SOP Classes

Service SOP Class Name	SOP Class UID	Conformance Level
Ultrasound Multi-Frame Image Storage (only for 3D data)	1.2.840.10008.5.1.4.1.1.3.1	Standard Extended
Service SOP Class Name	**SOP Class UID**	**Conformance Level**
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Standard Extended
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Standard Extended

Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Standard Extended
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Standard Extended

This is accomplished using the DIMSE C-STORE Service. The SCU issues a service request with a SOP instance that meets the requirements of the desired ultrasound, secondary capture, or structured report IOD.

The following Structured Report Templates are supported by the SONOVISTA FX:

- TID 5000 “OB-GYN Ultrasound Procedure Report”

The following table denotes the attributes included in the Ultrasound Image Object as implemented on the SONOVISTA FX. Attributes not listed are not used.

Table 9: Ultrasond Image and Ultrasound Retired Image IOD attributes

Module	Attribute	Tag	Notes
Patient Identification	Patient's Name	(0010,0010)	FX Patient Data Screen – Last Name, First & Middle fields Populated from Modality Worklist if used.
	Patient ID	(0010,0020)	FX Patient Data Screen – ID field. Default is today’s date & time (e.g., 03_04_2003_17_54_43 = Apr. 3, 2003 at 5:54:43 PM). Populated from Modality Worklist if used.
Patient Demographic	Patient's Birth Date	(0010,0030)	FX Patient Data Screen – DOB field. Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient's Sex	(0010,0040)	FX Patient Data Screen – Gender field. M = male F = female. O = Other Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient’s Age	(0010,1010)	Calculated from Patient Data Screen DOB field.
	Patient’s Size	(0010,1020)	FX Patient Data Screen – Height field. Populated from Modality Worklist if used.
	Patient’s Weight	(0010,1030)	FX Patient Data Screen – Weight field. Populated from Modality Worklist if used.

Module	Attribute	Tag	Notes
	Other Patient IDs	(0010,1000)	Populated from Worklist
Patient Study	Admitting Diagnosis Description	(0008,1080)	FX Patient Data Screen – Indication field. Populated from Modality Worklist if used.
General Study	Study Instance UID	(0020,000D)	Populated from Modality Worklist if used; generated by FX otherwise
	Image Type	(0008,0008)	Example value: ORIGINAL\PRIMARY\TEE\0001 Value 1: ORIGINAL or DERIVED Value 2: PRIMARY or SECONDARY Value 3: Set to value by exam type Value 4: It is constructed as a modality bit map to allow for a description of multi-modality displays. In using this bit map, the sum of the values of the various modalities will unambiguously Determine the constituent modalities. 0001 = 2D Imaging 0002 = M-Mode 0004 = CW Doppler 0008 = PW Doppler 0010 = Color Doppler 0020 = Color M-Mode 0040 = 3D Rendering 0100 = Color Power Mode
	Study Date	(0008,0020)	Date the exam started.
	Study Time	(0008,0030)	Time the exam started.
	Referring Physician's Name	(0008,0090)	FX Patient Data Screen – Physician field. Populated from Modality Worklist if used.
	Study ID	(0020,0010)	Generated by FX
	Accession Number	(0008,0050)	FX Patient Data Screen – Accession # field. Populated from Modality Worklist if used.

Module	Attribute	Tag	Notes
	Study Description	(0008,1030)	Populated with the first attribute from Modality Worklist in this list that contains a valid value: Study Description (0008,1030), Scheduled Procedure Step Description (0040,0007), Requested Procedure Description (0032,1060). If Modality Worklist was not used or none of the attributes contains a valid value FX Patient Data Screen – Indication field is used.
General Series	Modality	(0008,0060)	Always set to “US”
	Series Instance UID	(0020,000E)	Generated by X FX
	Series Number	(0020,0011)	Series Number in study (1-n).
	Laterality	(0020,0060)	Always sent as 0 length attribute
	(b)Series Date	(0008,0021)	Date the series started.
	(b)Series Time	(0008,0031)	Time the series started.
	(b)Series Description	(0008,103E)	Populated with Scheduled Procedure Step Description if a value was provided by Modality Worklist.
	(b)Protocol Name	(0018,1030)	The exam type of the most recent image stored in a particular series. If no images are stored for a series then the value is set to “Ultrasound”.
	(b)Request Attributes Sequence	(0040,0275)	Populated with Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>(b)Scheduled Procedure Step Description	(0040,0007)	Populated with Scheduled Procedure Step Description (0040, 0007) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>(b)Scheduled Protocol Code Sequence	(0040,0008)	Populated with Scheduled Protocol Code Sequence (0040, 0008) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.

Module	Attribute	Tag	Notes
	>Requested Procedure Description	(0032,1060)	Populated from Requested Procedure Description in MWL query
	>[(b)]Scheduled Procedure Step ID	(0040,0009)	Populated with Scheduled Procedure Step ID (0040, 0009) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>[(b)]Requested Procedure ID	(0040,1001)	Populated with Requested Procedure ID (0040, 1001) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	[(b)]Performed Procedure Step Start Date	(0040,0244)	Date the Performed Procedure Step was started.
	[(b)]Performed Procedure Step Start Time	(0040,0245)	Time the Performed Procedure Step was started.
	[(b)]Performed Procedure Step ID	(0040,0253)	Populated with Scheduled Procedure Step ID (0040, 0009) if provided by Modality Worklist.
	[(b)]Performed Procedure Step Description	(0040,0254)	Populated with Scheduled Procedure Step Description (0040,0007) if provided by Modality Worklist.
	[(b)]Performed Procedure Protocol Code Sequence	(0040,0260)	Populated with Scheduled Protocol Code Sequence (0040,0008) if provided by Modality Worklist.
	[(b)]Comments on the Performed Procedure Step	(0040,0280)	Populated with Comments on the Scheduled Procedure Step (0040,0400) if provided by Modality Worklist.
	Referenced Performed Procedure Step Sequence	(0008,1111)	Populated with MPPS SOP Class UID and MPPS SOP instance UID of MPPS command sent for the procedure step(s) performed.
General Equipment	Manufacturer	(0008,0070)	Set to “SIEMENS”

Module	Attribute	Tag	Notes
	Station Name	(0008, 1010)	Station AE title
	Institution Name	(0008,0080)	FX System Presets – Organization Name field.
	Software Versions	(0018,1020)	Set to the DICOM Software Version
	Manufacturer's Model Name	(0008,1090)	Set to "SONOVISTA FX"
General Image	Instance Number	(0020,0013)	Image number in study (1 – n)
	Patient Orientation	(0020,0020)	Always sent as 0 length attribute
Image Pixel	Samples per Pixel	(0028,0002)	Set to 1 for MONOCHROME2 images, 3 for RGB images.
	Photometric Interpretation	(0028,0004)	Set to "MONOCHROME2"or "RGB"
	Planar Configuration	(0028,0006)	Color-by-pixel. Set to 0 for RGB images, not provided for MONOCHROME2 images.
	Rows	(0028,0010)	Set to 460.
	Columns	(0028,0011)	Set to 640.
	Bits Allocated	(0028,0100)	Set to 8.
	Bits Stored	(0028,0101)	Set to 8.
	High Bit	(0028,0102)	Set to 7.
	Pixel Representation	(0028,0103)	Set to 0
	Pixel Data	(7FE0, 0010)	
US Image	Heart Rate	(0018,1088)	Only provided if heart rate is > 0
	Lossy Image Compression	(0028,2110)	"00"
SOP Common	SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.6.1 or 1.2.840.10008.5.1.4.1.1.6
	SOP Instance UID	(0008,0018)	Generated by FX

Module	Attribute	Tag	Notes
	Specific Character Set	(0008,0005)	Set to values as defined in Section 8.4 of this document
Image Plane	Pixel Spacing	(0028,0030)	Pixel Spacing information is only provided for single, full screen, 2D image types (2D image types are B-mode, B-mode with color, B-mode with power).
Region Calibration	(c)Sequence of Ultrasound Regions	(0018,6011)	
	>(c)Region Spatial Format	(0018,6012)	B-Mode (Tissue or Color) = 0001H M-Mode (Tissue or Color) = 0002H Spectral (CW/PW) Doppler = 0003H
	>(c)Region Data Type	(0018,6014)	B-Mode, M-Mode = 0001H (Tissue) Spectral Doppler = 0004H (CW Spectral Doppler) Spectral Doppler = 0003H (PW Spectral Doppler)
	>(c)Region Flags	(0018,6016)	1st Bit (LSB) = 1 (All images acquired are transparent) 2nd Bit = 1 (All images acquired are automatically scaled) 3rd Bit = 1 for frequency scale 3rd Bit = 0 for velocity scale. The value of the 3rd bit is undefined for any mode other than Doppler. The value for 3rd bit is undefined if both frequency and velocity scales are selected on the Doppler image. 4th Bit is Reserved and value is always 0
	>(c)Region Location Min X0	(0018,6018)	
	>(c)Region Location Min Y0	(0018,601A)	
	>(c)Region Location Max X1	(0018,601C)	
	>(c)Region Location Max Y1	(0018,601E)	

Module	Attribute	Tag	Notes
	>(c)Physical Units X direction	(0018,6024)	B-Mode (Tissue or Color) = 0003H (cm) M-Mode (Tissue or Color) = 0004H (seconds) Spectral (CW/PW) Doppler = 0004H (seconds)
	>(c)Physical Units Y direction	(0018,6026)	B-Mode (Tissue or Color) = 0003H (cm) M-Mode (Tissue or Color) = 0003H (cm) Spectral (CW/PW) Doppler = 0007H (cm/sec)
	>(c)Physical Delta X	(0018,602C)	
	>(c)Physical Delta Y	(0018,602E)	
	>(c)Reference Pixel X0	(0018,6020)	Attribute only set for Spectral Doppler Regions
	>(c)Reference Pixel Y0	(0018,6022)	Attribute only set for Spectral Doppler Regions
	>(c)Reference Pixel Physical Value X	(0018,6028)	Attribute only set for Spectral Doppler Regions When provided, value is always 0.
	>(c)Reference Pixel Physical Value Y	(0018,602A)	Attribute only set for Spectral Doppler Regions When provided, value is always 0.
Private Attributes	(a)Private Creator	(0011,0010)	Reserves tags 0011,1000 through 0011,10FF for use as private tags.
	(a)Siemens Medical Solutions Model Name	(0011,1010)	Always set to “SONOVISTA FX”.
	(a)DIMAQ Software Version	(0011,1011)	Set to version of DIMAQ software installed.
	(a)Private Data	(0011,1020)	For internal FX use only.
	(a)Private Data	(0011,1021)	For internal FX use only.
	(a)Private Creator	(0013,0010)	Reserves tags 0013, 1000 through 0013, 10FF for use as private tags.

Module	Attribute	Tag	Notes
	[(a)]Siemens Medical Solutions Model Name	(0013,1010)	Always set to “SONOVISTA FX”.
	[(a)]DIMAQ Software Version	(0013,1011)	Set to version of DIMAQ software installed.
	[(a)]Private Data	(0013,1020)	For internal FX use only.
	[(a)]Private Creator	(0015,0010)	This group is populated only if data is available. Reserves tags 0015, 1000 through 0015, 10FF for use as private tags.
	[(a)]Siemens Medical Solutions Model Name	(0015,1010)	Always set to “SONOVISTA FX”.
	[(a)]DIMAQ Software Version	(0015,1011)	Set to version of DIMAQ software installed.
	[(a)]Private Data	(0015,1020)	For internal FX use only.
	[(a)]Private Creator	(0017,0010)	This group is populated only if data is available. Reserves tags 0017, 1000 through 0017, 10FF for use as private tags.
	[(a)]Siemens Medical Solutions Model Name	(0017,1010)	Always set to “SONOVISTA FX”.
	[(a)]DIMAQ Software Version	(0017,1011)	Set to version of DIMAQ software installed.
	[(a)]Private Data	(0017,1020)	For internal FX use only.
	Private Creator	(0019,0010)	Reserves tags 0019, 1000 through 0019, 10FF for use as private tags.
	Import Structured Reports	(0019,1020)	Set to “O” if Obstetric ~~or cardiac~~ SR options was purchased and SR generation was configured. Otherwise set to “No”. Instructs SCP that it should attempt to import measurements from SR.

[(a)] The Attribute is only provided if the image is written to media.

[(b)] The Attribute is only provided if the procedure step is queried from the MWL server.

(c) Region Calibration is provided only for 2D (B-Mode), M-Mode and Spectral Doppler Regions. Region Calibration is not supported on Ultrasound RETIRED images, Screen Captures and post-processed images. Region Calibration is not supported for M-Mode or Spectral Doppler still images taken from Live Imaging.

This table denotes the attributes included in the Ultrasound Multi-Frame Image IOD as implemented on the SONOVISTA FX system, when used for 3D volumetric data sets. Each frame represents a single slice from the 3D volume.

Table 10: Ultrasound MultiFrame IOD Attributes – 3D Volumetric Data

Module	Attribute	Tag	Notes
Patient Identification	Patient's Name	(0010,0010)	FX Patient Data Screen – Last Name, First & Middle fields. Populated from Modality Worklist if used.
	Patient ID	(0010,0020)	FX Patient Data Screen – ID field. Default is today's date & time (e.g., 03_04_2003_17_54_43 = Apr. 3, 2003 at 5:54:43 PM). Populated from Modality Worklist if used.
Patient Demographic	Patient's Birth Date	(0010,0030)	FX Patient Data Screen – DOB field. Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient's Sex	(0010,0040)	FX Patient Data Screen – Gender field. M = male F = female. O= Other Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient's Age	(0010,1010)	Calculated from Patient Data Screen DOB field.
	Patient's Size	(0010,1020)	FX Patient Data Screen – Height field. Populated from Modality Worklist if used.
	Patient's Weight	(0010,1030)	FX Patient Data Screen – Weight field. Populated from Modality Worklist if used.
	Other Patient IDs	(0010,1000)	Populated from Worklist
Patient Study	Admitting Diagnosis Description	(0008,1080)	FX Patient Data Screen – Indication field. Populated from Modality Worklist if used.

Module	Attribute	Tag	Notes
General Study	Study Instance UID	(0020,000D)	Populated from Modality Worklist if used; generated by FX otherwise.
	Image Type	(0008,0008)	Value 1: ORIGINAL or DERIVED Value 2: PRIMARY or SECONDARY Value 3: Set to value by exam type Value 4: It is constructed as a modality bit map to allow for a description of multi-modality displays. In using this bit map, the sum of the values of the various modalities will unambiguously Determine the constituent modalities. 0001 = 2D Imaging 0002 = M-Mode 0004 = CW Doppler 0008 = PW Doppler 0010 = Color Doppler 0020 = Color M-Mode 0040 = 3D Rendering 0100 = Color Power Mode
	Study Date	(0008,0020)	Date the exam started.
	Study Time	(0008,0030)	Time the exam started.
	Referring Physician's Name	(0008,0090)	FX Patient Data Screen – Physician field. Populated from Modality Worklist if used.
	Study ID	(0020,0010)	Generated by FX
	Accession Number	(0008,0050)	FX Patient Data Screen – Accession # field. Populated from Modality Worklist if used.
	Study Description	(0008,1030)	Populated with the first attribute from Modality Worklist in this list that contains a valid value: Study Description (0008, 1030), Scheduled Procedure Step Description (0040, 0007), Requested Procedure Description (0032, 1060). If Modality Worklist was not used or none of the attributes contains a valid value FX Patient Data Screen – Indication field is used.
General Series	Modality	(0008,0060)	Always set to “US”
	Series Instance UID	(0020,000E)	Generated by FX

Module	Attribute	Tag	Notes
	Series Number	(0020,0011)	Series Number in study (1-n).
	Laterality	(0020,0060)	Always sent as 0 length attribute
	[(b)]Series Date	(0008,0021)	Date the series started.
	[(b)]Series Time	(0008,0031)	Time the series started.
	[(b)]Series Description	(0008,103E)	Populated with Scheduled Procedure Step Description if a value was provided by Modality Worklist.
	[(b)]Protocol Name	(0018,1030)	The exam type of the most recent image stored in a particular series. If no images are stored for a series then the value is set to “Ultrasound”.
	[(b)]Request Attributes Sequence	(0040,0275)	Populated with Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>[(b)]Scheduled Procedure Step Description	(0040,0007)	Populated with Scheduled Procedure Step Description (0040, 0007) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>[(b)]Scheduled Protocol Code Sequence	(0040,0008)	Populated with Scheduled Protocol Code Sequence (0040, 0008) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>[(b)]Scheduled Procedure Step ID	(0040,0009)	Populated with Scheduled Procedure Step ID (0040, 0009) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>[(b)]Requested Procedure ID	(0040,1001)	Populated with Requested Procedure ID (0040, 1001) from Scheduled Procedure Step Sequence (0040, 0100) if provided by Modality Worklist.
	>Requested Procedure Description	(0032,1060)	Populated from Requested Procedure Description in MWL query

Module	Attribute	Tag	Notes
	[b]Performed Procedure Step Start Date	(0040,0244)	Date the Performed Procedure Step was started.
	[b]Performed Procedure Step Start Time	(0040,0245)	Time the Performed Procedure Step was started.
	[b]Performed Procedure Step ID	(0040,0253)	Populated with Scheduled Procedure Step ID (0040,0009) if provided by Modality Worklist.
	[b]Performed Procedure Step Description	(0040,0254)	Populated with Scheduled Procedure Step Description (0040,0007) if provided by Modality Worklist.
	[b]Performed Procedure Protocol Code Sequence	(0040,0260)	Populated with Scheduled Protocol Code Sequence (0040,0008) if provided by Modality Worklist.
	[b]Comments on the Performed Procedure Step	(0040,0280)	Populated with Comments on the Scheduled Procedure Step (0040,0400) if provided by Modality Worklist.
	Referenced Performed Procedure Step Sequence	(0008,1111)	Populated with MPPS SOP Class UID and MPPS SOP instance UID of MPPS command sent for the procedure step(s) performed.
General Equipment	Manufacturer	(0008,0070)	Set to “SIEMENS”
	Station Name	(0008, 1010)	Station AE title
	Institution Name	(0008,0080)	FX System Presets – Organization Name field.
	Software Versions	(0018,1020)	Set to the DICOM Software Version
	Manufacturer’s Model Name	(0008,1090)	Set to “SONOVISTA FX”.
General Image	Instance Number	(0020,0013)	Image number in study (1 - n)
	Patient Orientation	(0020,0020)	Always sent as 0 length attribute

Module	Attribute	Tag	Notes
Image Pixel	Samples per Pixel	(0028,0002)	Set to 1 for MONOCHROME2 images, 3 for RGB and YBR_FULL_422 images.
	Photometric Interpretation	(0028,0004)	"YBR_FULL_422" if sent compressed, "RGB" or "MONOCHROME2" if sent uncompressed.
	Rows	(0028,0010)	Set to 460
	Columns	(0028,0011)	Set to 640.
	Bits Allocated	(0028,0100)	Set to 8.
	Bits Stored	(0028,0101)	Set to 8.
	High Bit	(0028,0102)	Set to 7.
	Pixel Representation	(0028,0103)	Set to 0.
	Pixel Data	(7FE0, 0010)	
US Image	Image Type	(0008,0008)	Sent as a 0 length.
	Lossy Image Compression	(0028,2110)	Always set to "01"
SOP Common	SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.3
	SOP Instance UID	(0008,0018)	Generated by FX
	Specific Character Set	(0008,0005)	Set to values as defined in Section 8.4 of this document
Multi-Frame	Number of Frames	(0028,0008)	
	Frame Increment Pointer	(0028,0009)	00181063H
~~Region Calibration~~	~~(c) Sequence of Ultrasound Regions~~	~~(0018,6011)~~	
	~~> (c) Region Spatial Format~~	~~(0018,6012)~~	~~B-Mode (Tissue or Color) = 0001H M-Mode (Tissue or Color) = 0002H Spectral (CW/PW) Doppler = 0003H~~

Module	Attribute	Tag	Notes
	>(e)Region Data Type	(0018,6014)	B-Mode, M-Mode = 0001H (Tissue) Spectral Doppler = 0004H (CW Spectral Doppler) Spectral Doppler = 0003H (PW Spectral Doppler)
	>(e)Region Flags	(0018,6016)	1st Bit (LSB) = 1 (All images acquired are transparent) 2nd Bit = 1 (All images acquired are automatically scaled) 3rd Bit = 1 for frequency scale 3rd Bit = 0 for velocity scale. The value of the 3rd bit is undefined for any mode other than Doppler. The value for 3rd bit is undefined if both frequency and velocity scales are selected on the Doppler image. 4th Bit is Reserved and value is always 0
	>(e)Region Location Min X0	(0018,6018)	
	>(e)Region Location Min Y0	(0018,601A)	
	>(e)Region Location Max X1	(0018,601C)	
	>(e)Region Location Max Y1	(0018,601E)	
	>(e)Physical Units X direction	(0018,6024)	B-Mode (Tissue or Color) = 0003H (cm) M-Mode (Tissue or Color) = 0004H (seconds) Spectral (CW/PW) Doppler = 0004H (seconds)
	>(e)Physical Units Y direction	(0018,6026)	B-Mode (Tissue or Color) = 0003H (cm) M-Mode (Tissue or Color) = 0003H (cm) Spectral (CW/PW) Doppler = 0007H (cm/sec)
	>(e)Physical Delta X	(0018,602C)	
	>(e)Physical Delta Y	(0018,602E)	
	>(e)Reference Pixel X0	(0018,6020)	Attribute only set for Spectral Doppler Regions

Module	Attribute	Tag	Notes
	~~>[(c)]Reference Pixel Y0~~	~~(0018,6022)~~	~~Attribute only set for Spectral Doppler Regions~~
	~~>[(c)]Reference Pixel Physical Value X~~	~~(0018,6028)~~	~~Attribute only set for Spectral Doppler Regions When provided, value is always 0.~~
	~~>[(c)]Reference Pixel Physical Value Y~~	~~(0018,602A)~~	~~Attribute only set for Spectral Doppler Regions When provided, value is always 0.~~
	~~>[(a,c)]Transducer Frequency~~	~~(0018,6030)~~	
	~~>[(a,c)]Pulse Repetition Frequency~~	~~(0018,6032)~~	
	~~>[(a,c)]Doppler Correction Angle~~	~~(0018,6034)~~	
Private Attributes	[(d)]Private Creator	(0011,0010)	Reserves tags 0011, 1000 through 0011, 10FF for use as private tags.
	[(d)]Siemens Medical Solutions Model Name	(0011,1010)	FX.
	[(d)]DIMAQ Software Version	(0011,1011)	Set to version of DIMAQ software installed.
	[(d)]Private Data	(0011,1020)	For internal FX use only.
	[(d)]Private Data	(0011,1021)	For internal FX use only.
	[(d)]Private Creator	(0013,0010)	For internal FX use only..
	[(d)]Siemens Medical Solutions Model Name	(0013,1010)	FX.
	[(d)]DIMAQ Software Version	(0013,1011)	Set to version of DIMAQ software installed.
	[(d)]Private Data	(0013,1020)	FX.
	[(d)]Private Creator	(0015,0010)	This group is populated only if data is available. Reserves tags 0015, 1000 through 0015,10FF for use as private tags.

Module	Attribute	Tag	Notes
	Private Creator	(7FDF,0010)	Reserved tags 7FDF,1000 through 7FDF,FE00 for use as private tags
	Private Creator	(7FDF,0011)	

Module	Attribute	Tag	Notes
FX Private Attributes	Private Creator	(0039,0010)	SIEMENS MED SMS USG Antares 3D VOLUME
	Release Version	(0039,1000)	3.0.3
	VolumeRawDataType	(0039,1004)	Data Type (Cartesian/Scan-Converted/PreScanConverted Format
	ScanType	(0039,1005)	
	ZlateralMin	(0039,1006)	Minimum span along the depth (wobble min.)
	ZlateralSpan	(0039,1007)	Span along the depth (wobble span)
	ZRadiusOfCurvature	(0039,1008)	Radius of curvature, in (wobble)
	WobbleCorrection	(0039,1009)	Wobbling shear correction factor (0.0 to 1.0)
	ScaleAlongWidth	(0039,1010)	Width scaling mm/pixel
	ScaleAlongHeight	(0039,1011)	Height scaling mm/pixel
	ScaleAlongDepth	(0039,1012)	Depth scaling mm/pixel
	BufferSize	(0039,1013)	
	AcquisitionRate	(0039,1014)	Time required to acquire one volume
	DepthMinCm	(0039,1015)	The min/start depth for the BImage
	IsLeftRightFlippedEn	(0039,1016)	Whether the acquired images were Left/Right flipped
	IsUpDownFlippedEn	(0039,1017)	Whether the acquired images were up/down flipped
	IsVolumeGeomAccurate	(0039,1018)	Is the volume passed is geometrically accurate (In order to display ruler)

Module	Attribute	Tag	Notes
	BByteMaskOffset	(0039,1019)	Bytemasks is the offset fro Mask data which is used for space leaping optimization in renderer
FX Private Attributes	BByteMaskSize	(0039,1020)	Size of the byte mask data
	DepthMaxCm	(0039,1021)	The max/end depth for the BImage
	AcqPlaneRotationDeg	(0039,1022)	Angle by which the volume is to be rotated around, normal to the Aquisition plane (Z axis) (in degrees)
	BeamAxialSpan	(0039,1023)	beam span, in mm
	BeamLateralMin	(0039,1024)	Min lateral angle
	BeamLateralSpan	(0039,1025)	Angular span
	BeamAxialMin	(0039,1026)	Axial min or radius of curvature in 2d
	NumDisplaySamples	(0039,1027)	Number of actual samples along each beam
	DVolumeWidth	(0039,1028)	Volume Width of the Power/Doppler Volume
	DVolumeDepth	(0039,1029)	Volume Depth of the Power/Doppler Volume
	DVolumeHeight	(0039,1030)	Volume Height of the Power/Doppler Volume
	DVolumePosX	(0039,1031)	
	DVolumePosY	(0039,1032)	
	DVolumePosZ	(0039,1033	
	DBeamAxialMin	(0039,1034)	Axial min or radius of curvature in 2d for Power/Doppler
	DBeamAxialSpan	(0039,1035)	
	DBeamLateralMin	(0039,1036)	Min lateral angle for Power/Doppler
	DBeamLateralSpan	(0039,1037)	Angular span from Power/Doppler
	NumOfVolumesInSequence	(0039,1038)	Number Of Volumes In Sequence
	DByteMaskOffset	(0039,1039)	Bytemasks is the offset for the mask data which is used for space leaping optimization in renderer when in Power/Doppler
	DByteMaskSize	(0039,1040)	Size of the byte mask data when in Power/Doppler
FX Private Attributes	PrivateCreatorVersionOfBookmark	(0039,1050)	3.6.0
	BCutPlaneEnable	(0039,1051)	Cut-plane volume rendering for B data
	BMprColorMapIndex	(0039,1052)	Index of the tint colormap for MPR B data
FX Private	BMprDynamicRangeDb	(0039,1053)	dB value of dynamic range curve for MPR B data

Module	Attribute	Tag	Notes
Attributes	BMprGrayMapIndex	(0039,1054)	Index of the image enhancement LUT for the MPR B data
	BVolumeRenderMode	(0039,1055)	Volume rendering mode for B data
	BVrBrightness	(0039,1056)	Brightness value for the volume rendered B data
	BVrContrast	(0039,1057)	Contrast value for the volume rendered B data
	BVrColorMapIndex	(0039,1058)	Index of the tint colormap for the volume rendered B data
	BVrDynamicRangeDb	(0039,1059)	dB value of dynamic range curve for the volume rendered B data
	BVrGrayMapIndex	(0039,105a)	Index of the image enhancement LUT for the volume rendered B data
	BVrOpacity	(0039,105b)	Opacity percentage of the opacity curve used for the volume rendered B data
	BVrThresholdHigh	(0039,105c)	High threshold of the opacity curve used for the volume rendered B data
	BVrThresholdLow	(0039,105d)	Low threshold of the opacity curve used for the volume rendered B data
	BPreProcessFilterMix	(0039,105e)	Mix percentage used for mixing filtered data for the volume rendered B data
	CCutPlaneEnable	(0039,105f)	Cut-plane volume rendering for B data
	CFrontClipMode	(0039,1060)	Flag indicating whether Niche and Parallel Cut edit operation will clip power data.
	CMprColorMapIndex	(0039,1061)	Index of the tint colormap for MPR power data
	CMprColorFlowPriorityIndex	(0039,1062)	Threshold representing amount of power data cut from the MPR power data
	CVolumeRenderMode	(0039,1063)	Volume rendering mode for power data
	CVrColorMapIndex	(0039,1064)	Index of the tint colormap for the volume rendered power data
	CVrColorFlowPriorityIndex	(0039,1065)	Threshold representing amount of power data cut from the volume rendered power data

Module	Attribute	Tag	Notes
FX Private Attributes	CVrOpacity	(0039,1066)	Opacity percentage of the opacity curve used for the volume rendered power data
	CVrThresholdHigh	(0039,1067)	High threshold of the opacity curve used for the volume rendered power data
	CVrThresholdLow	(0039,1068)	Low threshold of the opacity curve used for the volume rendered power data
	VoiMode	(0039,1069)	Flag indicating whether VOI is on or off
	VoiRotationOffsetDeg	(0039,106a)	Fixed rotation applied to VOI
	VoiSizeRatioX	(0039,106b)	Width of VOI in relative units
	VoiSizeRatioY	(0039,106c)	Length of VOI in relative units
	VoiSizeRatioZ	(0039,106d)	Height of VOI in relative units
	VoiSyncPlane	(0039,106e)	Plane synced to the VOI
	VoiViewMode	(0039,106f)	Type indicating whether the rendering is synced to the front or back of the VOI
	VrOrientationA	(0039,1070)	Matrix representing the oritentation of the volume rendered image
	MprOrientationA	(0039,1071)	Matrix representing the oritentation of the MPRs
	VrOffsetVector	(0039,1072	Vector representing the vertical and horizontal offset of the volume on the display
	BlendingRatio	(0039,1073)	Value indicating the amount of blending between B and power data when blend is on
	FusionBlendMode	(0039,1074)	Mode for fusing in one display power and B volume rendered data
	QualityFactor	(0039,1075)	Factor determining the volume rendering quality
	RendererType	(0039,1076)	Type of the rendererer engine used
	SliceMode	(0039,1077)	Mode for displaying the textured map MPRs in the 3D quadrant
	ActiveQuad	(0039,1078)	Value indicating which quadrant in the display is active
	ScreenMode	(0039,1079)	Value indicating which screen layout is applied
	CutPlaneSide	(0039,107a)	Value indicating which half space of the cut-plane is used for volume rendering

Module	Attribute	Tag	Notes
FX Private Attributes	WireframeMode	(0039,107b)	Flag indicating whether wireframe around rendered data is on or off
	CrossmarkMode	(0039,107c)	Flag indicating whether crossmark is shown on the display
	MprDisplayType	(0039,107d)	Value indicating whether B or power or B+power data are displayed in the MPRs
	VolumeDisplayType	(0039,107e)	Value indicating whether B or power or B+power data are displayed in the volume rendered image
	LastReset	(0039,107f)	Value indicating the last reset
	LastNonFullScreenMode	(0039,1080)	Value indicating the last active quadrant before entering full screen
	MprToolIndex	(0039,1081)	Index indicating which tool (rotation, pan, resizing) is used on the MPRs
	VoiToolIndex	(0039,1082)	Index indicating which tool (rotation, pan, resizing) is used on the volume rendered image when VOI is on
	ToolLoopMode	(0039,1083)	Value indicating in which loop
	VolumeArbMode	(0039,1084)	Index indicating whether volume or MPR rotation is active on the 3D display window
	MprZoomEn	(0039,1085)	Flag indicating whether zoom is enabled in the MPR
	IsVolumeZoomEn	(0039,1086)	Flag indicating whether zoom is enabled in the rendered volume
	ZoomLevelMpr	(0039,1087)	Value indicating the amount of zoom (in relative units) applied in the MPR
	ZoomLevelVolume	(0039,1088)	Value indicating the amount of zoom (in relative units) applied in the rendered volume
	IsAutoRotateEn	(0039,1089)	Flag indicating whether animation is enabled
	AutoRotateAxis	(0039,108a)	Value indicating the axis of rotation for the animation
	AutoRotateRangeIndex	(0039,108b)	Value indicating the total angle range for the animation

Module	Attribute	Tag	Notes
	AutoRotateSpeedIndex	(0039,108c)	Value indicating the speed (in relative units) for the animation
FX Private Attributes	CVrBrightness	(0039,108d)	Brightness value for the volume rendered power data
	CFlowStateIndex	(0039,108e)	Index for flow state of power data (low, medium, high)
	BSubmodeIndex	(0039,108f)	Index for indicating the B submode (THI, B, etc...)
	CSubmodeIndex	(0039,1090)	Index for indicating the C submode
	DICOMAttrNameCutPlane	(0039,1091	Quadrant used to cut volume when colume cut enabled
	BookmarkChunkId	(0039,1092)	Index of Bookmark
	SequenceMinChunkId	(0039,1093)	Begin range index of volume sequence
	SequenceMaxChunkId	(0039,1094)	End range index of volume sequence
	VolumeRateHz	(0039,1095)	Rate at which volumes are rendered
	VoiPositionOffsetX	(0039,109a)	Offset in the x dimension between the center of the VOI and center of volume in relative units
	VoiPositionOffsetY	(0039,109b)	Offset in the y dimension between the center of the VOI and center of volume in relative units
	VoiPositionOffsetZ	(0039,109c)	Offset in the z dimension between the center of the VOI and center of volume in relative units
	VrToolIndex	(0039,109d)	Index indicating which tool (rotation, pan, resizing) is used on the volume rendered image
	ShadingPercent	(0039,109e)	Value indicating the amount of shading in the volume rendered image
	VolumeType	(0039,109f)	Value indicating the type of volume (B or B and Power)
	VolumeRateHz	(0039,1095)	Rate at which volumes are rendered
	DICOMAttrNameVrQuadDisplayType	(0039,10a0)	The type of display to show in the volume quadrant
	DICOMAttrNameMprCenterLocation	(0039,10a1)	Offset location of slice centerpoint with respect to quadrant center

Module	Attribute	Tag	Notes
	DICOMAttrNameSliceMode	(0039,1077)	Value indicating that system in multislice mode
FX Private Attributes	DICOMAttrNameSliceRangeType	(0039,10e0)	Value indicating type of slice mode (horizontal/vertical)
	DICOMAttrNameSliceMPRPlane	(0039,10e1)	Value indicating selected MPR for slice mode (Acquisition/Elevation/Coronal)
	DICOMAttrNameSliceLayout	(0039,10e2)	Selected layout for slice mode (2x2, 3x3, 4x4, 6x6)
	DICOMAttrNameSliceSpacing	(0039,10e3)	Value indicates the spacing between MPR slices
	DICOMAttrNameVoiPivotX	(0039,10e6)	Curved TOP VOI pivot x
	DICOMAttrNameVoiPivotY	(0039,10e7)	Curved TOP VOI pivot y
	DICOMAttrNameVoiPivotZ	(0039,10e8)	Curved TOP VOI pivot z
	DICOMAttrNameCTopVoiQuad	(0039,10e9)	Curved TOP VOI Quad

Table 11: Secondary Capture Image IOD Attributes

Module	Attribute	Tag	Notes
Patient Identification	Patient's Name	(0010,0010)	FX Patient Data Screen – Last Name, First & Middle fields. Populated from Modality Worklist if used.
	Patient ID	(0010,0020)	FX Patient Data Screen – ID field. Default is today's date & time (e.g., 03_04_2003_17_54_43 = Apr. 3, 2003 at 5:54:43 PM). Populated from Modality Worklist if used.
Patient Demographic	Patient's Birth Date	(0010,0030)	FX Patient Data Screen – DOB field. Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient's Sex	(0010,0040)	FX Patient Data Screen – Gender field. M = male F = female. O= Other Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient's Age	(0010,1010)	Calculated from Patient Data Screen DOB field.
	Patient's Size	(0010,1020)	FX Patient Data Screen – Height field. Populated from Modality Worklist if used.

Module	Attribute	Tag	Notes
	Patient's Weight	(0010,1030)	FX Patient Data Screen – Weight field. Populated from Modality Worklist if used.
	Other Patient IDs	(0010,1000)	Populated from Worklist
Patient Study	Admitting Diagnosis Description	(0008,1080)	FX Patient Data Screen – Indication field. Populated from Modality Worklist if used.
General Study	Study Instance UID	(0020,000D)	Populated from Modality Worklist if used; generated by FX otherwise.
	Study Date	(0008,0020)	Date the exam started.
	Study Time	(0008,0030)	Time the exam started.
	Referring Physician's Name	(0008,0090)	FX Patient Data Screen – Physician field. Populated from Modality Worklist if used.
	Study ID	(0020,0010)	Generated by X FX
	Accession Number	(0008,0050)	FX Patient Data Screen – Accession # field. Populated from Modality Worklist if used.
	Study Description	(0008,1030)	Populated with the first attribute from Modality Worklist in this list that contains a valid value: Study Description (0008,1030), Scheduled Procedure Step Description (0040,0007), Requested Procedure Description (0032,1060). If Modality Worklist was not used or none of the attributes contains a valid value FX Patient Data Screen – Indication field is used.
General Series	Modality	(0008,0060)	Always set to "US"
	Series Instance UID	(0020,000E)	Generated by FX
	Series Number	(0020,0011)	Series Number in study (1-n).
	Laterality	(0020,0060)	Always sent as 0 length attribute
	[(b)]Series Date	(0008,0021)	Date the series started.
	[(b)]Series Time	(0008,0031)	Time the series started.

Module	Attribute	Tag	Notes
	[(b)]Series Description	(0008,103E)	Populated with Scheduled Procedure Step Description if a value was provided by Modality Worklist.
	[(b)]Protocol Name	(0018,1030)	The exam type of the most recent image stored in a particular series. If no images are stored for a series then the value is set to "Ultrasound".
	[(b)]Request Attributes Sequence	(0040,0275)	Populated with Scheduled Procedure Step Sequence (0040,0100) if provided by Modality Worklist.
	>[(b)]Scheduled Procedure Step Description	(0040,0007)	Populated with Scheduled Procedure Step Description (0040,0007) from Scheduled Procedure Step Sequence (0040,0100) if provided by Modality Worklist.
	>[(b)]Scheduled Protocol Code Sequence	(0040,0008)	Populated with Scheduled Protocol Code Sequence (0040,0008) from Scheduled Procedure Step Sequence (0040,0100) if provided by Modality Worklist.
	>[(b)]Scheduled Procedure Step ID	(0040,0009)	Populated with Scheduled Procedure Step ID (0040,0009) from Scheduled Procedure Step Sequence (0040,0100) if provided by Modality Worklist.
	>[(b)]Requested Procedure ID	(0040,1001)	Populated with Requested Procedure ID (0040,1001) from Scheduled Procedure Step Sequence (0040,0100) if provided by Modality Worklist.
	>Requested Procedure Description	(0032,1060)	Populated from Requested Procedure Description in MWL query
	[(b)]Performed Procedure Step Start Date	(0040,0244)	Date the Performed Procedure Step was started.
	[(b)]Performed Procedure Step Start Time	(0040,0245)	Time the Performed Procedure Step was started.

Module	Attribute	Tag	Notes
	[b]Performed Procedure Step ID	(0040,0253)	Populated with Scheduled Procedure Step ID (0040,0009) if provided by Modality Worklist.
	[b]Performed Procedure Step Description	(0040,0254)	Populated with Scheduled Procedure Step Description (0040,0007) if provided by Modality Worklist.
	[b]Performed Procedure Protocol Code Sequence	(0040,0260)	Populated with Scheduled Protocol Code Sequence (0040,0008) if provided by Modality Worklist.
	[b]Comments on the Performed Procedure Step	(0040,0280)	Populated with Comments on the Scheduled Procedure Step (0040,0400) if provided by Modality Worklist.
	Referenced Performed Procedure Step Sequence	(0008,1111)	Populated with MPPS SOP Class UID and MPPS SOP instance UID of MPPS command sent for the procedure step(s) performed.
SC Equipment Module	Conversion Type	(0008,0064)	Set to “WSD”
General Equipment	Manufacturer	(0008,0070)	Set to “SIEMENS”
	Institution Name	(0008,0080)	FX System Presets – Organization Name field.
	Station Name	(0008, 1010)	Station AE title
	Software Versions	(0018,1020)	Set to the DICOM Software Version
	Manufacturer’s Model Name	(0008,1090)	Set to “FX”.
General Image	Instance Number	(0020,0013)	Image number in study (1 – n)
	Patient Orientation	(0020,0020)	Always sent as 0 length attribute.
Image Pixel	Samples per Pixel	(0028,0002)	Set to 1 for MONOCHROME2 images, 3 for RGB images.
	Photometric Interpretation	(0028,0004)	“RGB” or “MONOCHROME2“

Module	Attribute	Tag	Notes
	Planar Configuration	(0028,0006)	Color-by-pixel. Set to 0 for RGB images, not provided for MONOCHROME2 images.
	Rows	(0028,0010)	Set to 460
	Columns	(0028,0011)	Set to 640
	Bits Allocated	(0028,0100)	Set to 8.
	Bits Stored	(0028,0101)	Set to 8.
	High Bit	(0028,0102)	Set to 7.
	Pixel Representation	(0028,0103)	Set to 0.
	Pixel Data	(7FE0,0010)	
SOP Common	SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
	SOP Instance UID	(0008,0018)	Generated by FX
	Specific Character Set	(0008,0005)	Set to values as defined in Section 8.4 of this document
Private Attributes	[(a)]Private Creator	(0011,0010)	Reserves tags 0011, 1000 through 0011,10FF for use as private tags.
	[(a)]Siemens Medical Solutions Model Name	(0011,1010)	Always set to “SONOVISTA FX”.
	[(a)]DIMAQ Software Version	(0011,1011)	Set to version of DIMAQ software installed.
	[(a)]Private Data	(0011,1020)	For internal FX use only.
	[(a)]Private Data	(0011,1021)	For internal FX use only.
	[(a)]Private Creator	(0013,0010)	Reserves tags 0013,1000 through 0013,10FF for use as private tags.
	[(a)]Siemens Medical Solutions Model Name	(0013,1010)	Always set to “SONOVISTA FX”.
	[(a)]DIMAQ Software Version	(0013,1011)	Set to version of DIMAQ software installed.
	[(a)]Private Data	(0013,1020)	For internal FX use only.

Module	Attribute	Tag	Notes
	[a]Private Creator	(0015,0010)	This group is populated only if data is available. Reserves tags 0015,1000 through 0015,10FF for use as private tags.
	[a]Siemens Medical Solutions Model Name	(0015,1010)	Always set to “SONOVISTA FX”.
	[a]DIMAQ Software Version	(0015,1011)	Set to version of DIMAQ software installed.
	[a]Private Data	(0015,1020)	For internal FX use only.
	[a]Private Creator	(0017,0010)	This group is populated only if data is available. Reserves tags 0017,1000 through 0017,10FF for use as private tags.
	[a]Siemens Medical Solutions Model Name	(0017,1010)	Always set to “SONOVISTA FX”.
	[a]DIMAQ Software Version	(0017,1011)	Set to version of DIMAQ software installed.
	[a]Private Data	(0017,1020)	For internal FX use only.
	Private Creator	(0019,0010)	Reserves tags 0019,1000 through 0019,10FF for use as private tags.
	Import Structured Reports	(0019,1020)	Set to “O” if Obstetric SR options was purchased and SR generation was configured. Otherwise set to “No”. Instructs SCP that it should attempt to import Obstetric measurements from SR.

[a] The Attribute is only provided if the image is written to media.

[b] The Attribute is only provided if the procedure step is queried from the MWL server.

The following table denotes the attributes included in the Comprehensive SR Object as implemented on the SONOVISTA FX. Attributes not listed are not used.

Table 12: Comprehensive SR IOD Attributes

Module	Attribute	Tag	Notes

Module	Attribute	Tag	Notes
Patient	Patient's Name	(0010,0010)	FX Patient Data Screen – Last Name, First & Middle fields. Populated from Modality Worklist if used.
	Patient ID	(0010,0020)	FX Patient Data Screen – ID field. Default is today's date & time (e.g., 03_04_2003_17_54_43 = Apr. 3, 2003 at 5:54:43 PM). Populated from Modality Worklist if used.
	Patient's Birth Date	(0010,0030)	FX Patient Data Screen – DOB field. Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient's Sex	(0010,0040)	FX Patient Data Screen – Gender field. M = male F = female. O = Other Default is a zero length attribute. Populated from Modality Worklist if used.
	Patient's Size	(0010,1020)	FX Patient Data Screen – Height field. Populated from Modality Worklist if used.
	Patient's Weight	(0010,1030)	FX Patient Data Screen – Weight field. Populated from Modality Worklist if used.
Patient Study	Admitting Diagnosis Description	(0008,1080)	FX Patient Data Screen – Indication field. Populated from Modality Worklist if used.
General Study	Study Instance UID	(0020,000D)	Populated from Modality Worklist if used; generated by FX otherwise
	Study Date	(0008,0020)	Date the exam started.
	Study Time	(0008,0030)	Time the exam started.
	Referring Physician's Name	(0008,0090)	FX Patient Data Screen – Physician field. Populated from Modality Worklist if used.
	Study ID	(0020,0010)	Generated by X FX
	Accession Number	(0008,0050)	FX Patient Data Screen – Accession # field. Populated from Modality Worklist if used.

Module	Attribute	Tag	Notes
	Study Description	(0008,1030)	Populated with the first attribute from Modality Worklist in this list that contains a valid value: Study Description (0008,1030), Scheduled Procedure Step Description (0040,0007), Requested Procedure Description (0032,1060). If Modality Worklist was not used or none of the attributes contains a valid value FX Patient Data Screen – Indication field is used.
SR Document Series	Modality	(0008,0060)	Always set to “SR”
	Series Instance UID	(0020,000E)	Generated by FX
	Series Number	(0020,0011)	Series Number in study (2-n).
	Series Date	(0008,0021)	Date the series started.
	Series Time	(0008,0031)	Time the series started.
	Referenced Performed Procedure Step Sequence	(0008,1111)	Populated with MPPS SOP Class UID and MPPS SOP instance UID of MPPS command sent for the procedure step(s) performed.
General Equipment	Manufacturer	(0008,0070)	Set to “SIEMENS”
	Institution Name	(0008,0080)	FX System Presets – Organization Name field.
	Software Versions	(0018,1020)	Set to the DICOM Software Version
	Manufacturer’s Model Name	(0008,1090)	Set to “SONOVISTA FX”
SR Document General	Content Date	(0008,0023)	Date the report was created
	Content Time	(0008,0033)	Time the report was created
	Instance Number	(0020,0013)	Always set to 0.
	Completion Flag	(0040,A491)	Always set to “PARTIAL”
	Verification Flag	(0040,A493)	Always set to “UNVERIFIED”

Module	Attribute	Tag	Notes
	Predecessor Documents Sequence	(0040,A360)	Supplied if a previous SR was generated for the study. Populated with SOP Class UID and SOP Instance UID of the previous Obstetric SRs for the study, if any. See table C17-2 in PS 3.3-2004 for sequence definition.
	Performed Procedure Code Sequence	(0040,A372)	Populated with contents of Procedure Code Sequence from Modality Worklist if available, empty otherwise. See table C17-2 in PS 3.3-2004 for sequence definition.
	Current Requested Procedure Evidence Sequence	(0040,A375)	Lists all images the study. See table C17-2 in PS 3.3-2004 for sequence definition.
SOP Common	SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.88.33
	SOP Instance UID	(0008,0018)	Generated by FX.
	Specific Character Set	(0008,0005)	Set to values as defined in Section 8.4 of this document.
	Instance Creation Date	(0008,0012)	Date the SOP Instance was created.
	Instance Creation Time	(0008,0013)	Time the SOP Instance was created.
	Instance Creator UID	(0008,0014)	
Private Attributes	Private Creator	(0019,0010)	Reserves tags 0019,1000 through 0019,10FF for use as private tags.
	Import Structured Reports	(0019,1020)	Set to “O” if SR options were purchased and SR generation was configured. Otherwise set to “No”. Instructs SCP that it should attempt to import measurements from SR.

Error Handling

The following table indicates the response status codes that are handled by the SONOVISTA FX

AE, which a SCP may return following the SCU’s C-STORE-RSP command.

A successful C-STORE operation will allow the SONOVIATA FX AE to continue to the next action desired by the user.

Table 13: C-STORE Status Responses

Service Status	Further Meaning	Protocol Codes	Related Fields
Refused	Out of resources.	A7xx	None
Error	Data set does not match SOP Class.	A9xx	None
	Cannot understand.	Cxxx	
Warning	Coercion of data Elements.	B000	None
	Data set does not match SOP Class.	B007	
	Elements discarded.	B006	
Success		0000	None

If the C-STORE operation is not successful, the image(s) and Structured Report(s), if any, are spooled on the SONOVISTA FX hard drive. A user-configured number of additional attempts are made to store the image(s) and Structured Report(s). If these attempts fail, the user must select the job and press “Retry Job” on the Store Status page to complete the C-STORE operation.

All image and Structured Report storage on the SONOVISTA FX system hard drive is temporary in nature. If an attempt is made to store images on a full SONOVISTA FX system hard drive, the system will attempt to delete studies archived to CD or DICOM. If no delete able data exists, a “DISK FULL” message is displayed on the SONOVISTA FX system display. The user must then delete studies not archived in order to store additional images.

4.3.3 Real World Activity - Print

SONOVISTA FX facilitates user to print images as they are being created or later in review mode.

Paging images during acquisition

One or more of programmable keys on the control panel can be configured for Print (DICOM B/W Print and/or DICOM Color Print). When the user presses one of the configured keys on the control panel, the image is acquired, stored on the hard disk and placed in a page under the respective printer layout (DICOM B/W Printer Layout or DICOM Color Printer Layout).

Paging images in Review mode

User can select either individual images from open or closed studies, or one or more closed studies and queue them up for print. DICOM B/W Printer and DICOM Color Printer buttons are available in Review screen for this operation. When a study is selected for print, all single-frame images belonging to the study will be printed.

Transfer of pages to the Printer

Pages may be immediately transferred or delayed till the end of study using the transfer configuration.

SONOVISTA FX supports two configurations: “Print At End of Exam” and “Print When Page Is Full”.

If the configuration is set to “Print At End of Exam”, all pages queued to destination devices will be transferred as a batch when the user selects “Close Study” or “New Patient”.

If the configuration is set to “Print When Page Is Full”, a page is transferred to destination devices immediately after it is full.

For both “Print At End of Exam”, and “Print When Page Is Full” settings, image transfer will be delayed if the SONOVISTA FX is busy performing another DICOM Command (Store/Print/Echo).

Associated Real World Activities

An association is established when the user initiates a “B/W Print” or “Color Print” operation from the Review screen. Individual images or entire exams can be transferred to the selected DICOM Print device. The association is closed no pages are available to be printed for five seconds. An association may also be opened after a network outage or when the system is powered-on if images are queued to be printed.

Proposed Presentation Context to a Grayscale Print Server

Table 14: Grayscale Print Presentation Context

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

SOP Specific Conformance to Basic Grayscale Print Management Meta SOP Class

The SONOVISTA FX AE provides standard conformance of the Grayscale Meta SOP classes as an SCU. Specifically, with respect to the Basic Grayscale Print Management Meta SOP Class this means conformance to the underlying SOP classes:

Table 15: Conformance to Grayscale Print Meta SOP Class

SOP Class Name	SOP Class UID	Conformance Level
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Standard
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Standard
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Standard
Printer SOP Class	1.2.840.10008.5.1.1.16	Standard

All mandatory elements of these classes are supported.

Specific Conformance to Basic Film Session SOP Class

DICOM specified usage - M = Mandatory; U = User Option

Table 16: Supported DIMSE Services for Basic Film Session SOP Class

Name	Usage	Description
N-Create	M	Creates the Film Session.
N-Set	U	Not used.
N-Delete	U	Deletes the Film Session.
N-Action	U	Not used.

SOP Specific Conformance to Basic Film Box SOP Class

Table 17: Supported DIMSE Services for Basic Film Box SOP Class

Name	Usage	Description
N-Create	M	Creates the Film Box.
N-Set	U	Not used.
N-Delete	U	Deletes the Film Box. Issued after each film is printed.
N-Action	M	PRINT. Sent after each Film Box is filled, and at the end of the exam to force a print of partially filled Film Box.

Table 18: Attributes set for the Basic Film Box SOP Class

Attribute Name	Attribute Tag	Usage	Range	Description
Image Display Format	(2010,0010)	M	STANDARD\ X,Y	Where X, Y can be configured/ selected as 1*1, 1*2, 2*2, 2*3, 3*2, 3*3, 3*5, 4*5, 4*6, 5*6
Film Orientation	(2010,0040)	U	PORTRAIT LANDSCAPE	Range may be limited by print server/printer.

Film Size ID	(2010,0050)	U	8INX10IN 8.5INX11IN 10INX12IN 10INX14IN 11INX14IN 11INX17IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM A3 A4	Range may be limited by print server/printer.
Magnification Type	(2010,0060)	U	REPLICATE BILINEAR CUBIC NONE	
Min. Density	(2010,0120)	U	0-99,999,999	Printer specific
Max Density	(2010,0130)	U	0-99,999,999	Printer specific
Configuration Information	(2010,0150)	U		Printer specific
Smoothing Type	(2010,0080)	U		Printer specific
Border Density	(2010,0100)	U	BLACK WHITE	
Empty Image Density	(2010,0110)	U	BLACK WHITE	
Trim	(2010,0140)	U	YES NO	

SOP Specific Conformance to Basic Grayscale Image Box SOP Class

Table 19: Supported DIMSE Services for the Basic Grayscale Image Box SOP

Name	Usage	Description
N-Set	M	The SCP for each potential image of the film box creates an image box instance. Only those instances, which actually contain images, will be updated with the N-SET message.

Table 20: Attributes set for the Basic Grayscale Image Box SOP Class

Name	Attribute	Range	Description
Image Position	(2020,0010)	1-30	Value according to Image Display Format
Polarity	(2020,0020)	NORMAL, REVERSE	Intensity mapping between display and print

Table 21: Supported DIMSE Services for the Printer SOP

Name	Usage	Description
N-Event-Report	M	Ignored and not handled.
N-Get	U	May be issued by this device at any time to get printer status.

Table 22: Supported Printer SOP Class Element

Name	Usage	Range	Description
Printer Status	U	WARNING FAILURE	During a “Failure” the Print job will be displayed as “Failed”
Printer Status Information	U	Vendor specific	Reported to user if printer status = WARNING or FAILURE.

Proposed Presentation Context to a Color Print Server

Table 23: Color Print Server Presentation Context

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

SOP Specific Conformance to Basic Color Print Management Meta SOP Class

The SONOVISTA FX Print AE provides standard conformance to the color printing Meta SOP classes as an SCU. Specifically, with respect to the Basic Color Print Management Meta SOP Class this means conformance to the underlying SOP classes:

Table 24: Conformance to Color Print Meta SOP Class

SOP Class Name	SOP Class UID	Conformance Level
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Standard
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Standard
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Standard
Printer SOP Class	1.2.840.10008.5.1.1.16	Standard

SOP Specific Conformance to Basic Color Image Box SOP Class

The Basic Color Print Management Meta SOP Class makes identical use of the *Basic Film Session SOP Class, Basic Film Box SOP Class* and *Printer SOP Class* elements, which have been previously described for grayscale image printing. Therefore, these will not be described again in this section on color printing. However, it should be noted that certain attributes, such as Medium Type which is defined in the Basic Film Session SOP Class, are highly likely to require printer/print server specific media.

Table 25: Supported DIMSE Services for the Basic Color Image Box SOP Class

Name	Usage	Description
N-Set	M	The SCP for each potential image of the film box creates an image box instance. Only those instances, which actually contain images, will be updated with the N-SET message.

Table 26: Attributes set for the Basic Color Image Box SOP Class

Name	Attribute	Range	Description
Planar Configuration	(0028,0006)	Color-by-plane	Red plane, Green plane, Blue plane.

The Printer SOP Class behavior is identical to that used for grayscale printing.

Error Handling

The SONOVISTA FX Print AE supports the following error codes and reports failures to the user.

Table 27: Supported Error Codes for Printer Classes

Service Status	Further Meaning	Protocol Codes
Success	Film accepted for Printing	0000
Warning	Film accepted for Printing, one or more settings ignored.	107,116,B600,B605
Failure	Printing not successful	C602, C603, C613

If the print operation is not successful, the image(s) are spooled on the SONOVISTA FX hard drive. A user-configured number of additional attempts are made to print the image(s). If these attempts fail, the user must select the job and press “Retry Job” on the Print Status page to complete the print operation.

4.3.4 Real World Activity – Modality Worklist

A separate Network association is established by the AE for each Worklist query operation, with only one active query at a time. The association is closed at completion of the query.

Table 28: Worklist Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

The SONOVISTA FX will always act as an SCU and as the client in a client-server model.

SOP Specific Conformance to Modality Worklist Service SOP Classes

The Worklist AE provides conformance to the following DICOM Service SOP Classes as an SCU all at a standard extended level of conformance:

Table 29: Worklist Supported SOP Classes

Supported SOP Class Name	SOP Class UID	Conformance Level
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Standard Extended

The following table provides the list of attributes requested in the Modality Worklist Query.

Table 30: Modality Worklist Information Model Attributes

Attribute Name	Tag
Specific Character Set	(0008,0005)
Accession number	(0008,0050)*
Referring Physician's Name	(0008,0090)
Study Description	(0008,1030)
Admitting Diagnoses Description	(0008,1030)
Referenced Study Sequence	(0008,1110)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Patient's Name	(0010,0010)*
Patient ID	(0010,0020)*
Patient's Birth Date	(0010,0030)
Patient's Sex	(0010,0040)
Patient's Size	(0010,1020)
Patient's Weight	(0010,1030)
Medical Alerts	(0010,2000)
Contrast Allergies	(0010,2110)
Pregnancy Status	(0010,21C0)
Last Menstrual Date	(0010,21D0)
Patient Comments	(0010,4000)
Study Instance UID	(0020,000D)
Requesting Physician	(0032,1032)
Requested Procedure Description	(0032,1060)
Requested Procedure Code Sequence	(0040,0008)
>Code Value	(0008,0100)
>Coding Scheme Designator	(0008,0102)
>Coding Scheme Version	(0008,0103)

Attribute Name	Tag
>Code Meaning	(0008,0104)
Special Needs	(0038,0050)
Patient State	(0038,0500)
Scheduled Procedure Step Sequence	(0040,0100)
>Modality	(0008,0060)
>Scheduled Station AE Title	(0040,0001)*
>Scheduled Procedure Step Start Date	(0040,0002)
>Scheduled Procedure Step Start Time	(0040,0003)
>Scheduled Performing Physician's Name	(0040,0006)
>Scheduled Procedure Step Description	(0040,0007)
>Scheduled Protocol Code Sequence	(0040,0008)
>>Code Value	(0008,0100)
>>Coding Scheme Designator	(0008,0102)
>>Coding Scheme Version	(0008,0103)
>>Code Meaning	(0008,0104)
>Scheduled Procedure Step ID	(0040,0009)
>Comments on the Scheduled Procedure Step	(0040,0400)
Requested Procedure ID	(0040,1001)*
Reason for the Requested Procedure	(0040,1002)
*Indicates parameter may be populated for query.	

4.3.5 Real World Activity - Modality Performed Procedure Step

This operation allows the AE to create an instance of the Modality Performed Procedure Step SOP Class (MPPS) and provide information about a specific real world Performed Procedure Step that is under control of the SCU. This operation is invoked through the DIMSE N-CREATE and N-SET services.

The SONOVISTA FX conforms to the IHE Scheduled Workflow use case.

A list of scheduled procedures and procedure steps will be accessible from the Worklist and Procedure screens. The Performed Procedure Step User Interface allows the operator to set the status of the

performed procedure step. The system shall establish an association for N-CREATE and N-SET, if another N-CREATE or N-SET is available within 5 seconds, it will be sent using the same association.

Starting a Performed Procedure Step

When the user depresses the 'OK' button on the New Patient Screen a performed procedure SOP Class instance will be created using the N-CREATE DIMSE service for the selected scheduled procedure.

Ending a Performed Procedure Step

When the user selects 'Completed' or 'Discontinued' from the MPPS User Interface, the performed procedure step will be closed using the N-SET DIMSE service.

New Patient Request

If the 'New Patient' button is selected and there are opened performed procedure steps, the user shall be prompted for a closure status for the opened procedure step by the MPPS User Interface. Any opened procedure steps must be closed before any 'new patient' data can be entered.

System Shutdown

If the user requests 'System Shutdown' and there is an open performed procedure step, the user will be prompted for a closure status for the open procedure step. All procedure steps should be closed before the system can be shutdown. Failure to close a procedure step will result in the procedure step being set to Discontinued.

Error Handling

If the MPPS operation is not successful, the MPPS command is spooled on the SONOVISTA FX hard drive. A user-configured number of additional attempts are made to complete the MPPS Commands. If these attempts fail, the user must select this job and press "Retry Job" on the Store Status page to complete the MPPS operation.

Proposed Presentation Context

Table 31: MPPS Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

The SONOVISTA FX system will always act as an SCU and be the client in a client – server model.

SOP Specific Conformance to Modality Performed Procedure Step SOP Classes

The Modality Performed Procedure Step AE provides a conforming implementation of the following DICOM Service SOP Class as an SCU at a standard extended level of conformance.

Table 32: Supported SOP Class

Supported SOP Class Name	SOP Class UID	Conformance Level
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Standard Extended

The following tables provide the list of attributes supported by the AE in the implementation of MPPS SOP Class including N-CREATE, N-SET and Final State attributes. The SONOVISTA FX sends N-SET only at final state.

Table 33: Modality Performed Procedure Step Attributes in N-CREATE

Attribute	Tag	Notes
Specific Character Set	(0008,0005)	Created from values as defined in Section 8.4 of this document or as received from MWL
Scheduled Step Attribute Sequence	(0040,0270)	
>Study Instance UID	(0020,000D)	Value obtained from Modality WorkList; generated by FX in some cases
>Referenced Study Sequence	(0008,1110)	Populated with contents of Referenced Study Sequence from Modality Worklist if used, created otherwise. See table F.7.2-1 in PS 3.4-2004 for sequence definition.
>>Referenced SOP Class UID	(0008,1150)	Populated with contents of Referenced Study Sequence from Modality Worklist if used, created otherwise. See table F.7.2-1 in PS 3.4-2004 for sequence definition.
>>Referenced SOP Instance UID	(0008,1155)	Populated with contents of Referenced Study Sequence from Modality Worklist if used, created otherwise. See table F.7.2-1 in PS 3.4-2004 for sequence definition.
>Accession Number	(0008,0050)	Value obtained from Modality WorkList or user input
>Requested Procedure ID	(0040,1001)	Value obtained from Modality WorkList or created
>Requested Procedure Description	(0032,1060)	From Modality WorkList or zero length
>Scheduled Procedure Step ID	(0040,0009)	From Modality WorkList or zero length
>Scheduled Procedure Step Description	(0040,0007)	From Modality WorkList or zero length
>Scheduled Protocol Code Sequence	(0040,0008)	From Modality WorkList or zero length
>>Code Value	(0008,0100)	
>>Coding Scheme Designator	(0008,0102)	
>>Coding Scheme Version	(0008,0103)	
>>Code Meaning	(0008,0104)	Value obtained from Modality WorkList

Attribute	Tag	Notes
Patient's Name	(0010,0010)	Value obtained from Modality WorkList or user input
Patient ID	(0010,0020)	Value obtained from Modality WorkList or user input
Patient's Birth Date	(0010,0030)	Value obtained from Modality WorkList or user input
Patient's Sex	(0010,0040)	Value obtained from Modality WorkList or user input
Referenced Patient Sequence	(0008,1120)	Zero length
>Referenced SOP Class UID	(0008,1150)	
>Referenced Instance UID	(0008,1155)	
Performed Station Name	(0040,0242)	Own hostname
Performed Location	(0040,0243)	From institution name
Performed Procedure Step Start Date	(0040,0244)	The start date of the performed procedure step.
Performed Procedure Step Start Time	(0040,0245)	The start time of the performed procedure step.
Performed Procedure Step Status	(0040,0252)	Always set to "In-Progress".
Performed Procedure Step Description	(0040,0254)	Value obtained from Modality WorkList or sent as zero length
Performed Procedure Type Description	(0040,0255)	sent as zero length
Procedure Code Sequence	(0008,1032)	Populated with contents of Requested Procedure Code Sequence from Modality Worklist if used, empty otherwise. See table F.7.2-1 in PS 3.4-2004 for sequence definition.
>Code Value	(0008,0100)	-
>Coding Scheme Designator	(0008,0102)	-

Attribute	Tag	Notes
>Coding Scheme Version	(0008,0103)	-
>Code Meaning	(0008,0104)	-
Performed Procedure Step End Date	(0040,0250)	Always sent as 0 length attribute
Performed Procedure Step End Time	(0040,0251)	Always sent as 0 length attribute
Modality	(0008,0060)	Always set to US
Study ID	(0020,0010)	Populated from Requested Procedure ID (0040,1001) if Modality Worklist is used; created by FX otherwise
Performed Protocol Code Sequence	(0040,0260)	Obtained from Scheduled Action Item Code Sequence (MWL query) or sent as zero length
Performed Series Sequence	(0040,0340)	Always empty
Performed Series Sequence	(0040,0340)	
>Performing Physician's Name	(0008,1050)	From MWL or user input
>Protocol Name	(0018,1030)	Set to exam type
>Operators' Name	(0008,1070)	Zero length
>Series Instance UID	(0020,000E)	Created
>Series Description	(0008,103E)	Zero length
>Retrieve AE Title	(0008,0054)	Zero length
>Referenced Image Sequence	(0008,1140)	Zero length
>>Referenced SOP Class UID	(0008,1150)	-
>>Referenced SOP Instance UID	(0008,1155)	-
>Referenced Standalone SOP Instance Sequence	(0040,0220)	Zero length

Table 34: Modality Performed Procedure Step Attributes in N-SET

Attribute	Tag	Notes
Performed Procedure Step Status	(0040,0252)	Set to “Discontinued” or “Completed” based on user selection.
Performed Procedure Step End Date	(0040,0250)	Date the procedure step was completed
Performed Procedure Step End Time	(0040,0251)	Time the procedure step was completed
Performed Action Item Code Sequence	(0040,0260)	From Scheduled Action Item Code Sequence
>Code Value	(0008,0100)	
>Coding Scheme Designator	(0008,0102)	
>Coding Scheme Version	(0008,0103)	
>Code Meaning	(0008,0104)	
Performed Series Sequence	(0040,0340)	Shall contain only one series
>Performing Physician’s Name	(0008,1050)	Zero length
>Protocol Name	(0008,1030)	Exam type specified by the operator.
>Operator’s Name	(0008,1070)	Zero length
>Series Instance UID	(0020,000E)	The Instance UID of the series to which the procedure belongs.
>Series Description	(0008,103E)	Always sent as 0 length attribute
>Retrieve AE Title	(0008,0054)	Always sent as 0 length attribute
>Referenced Image Sequence	(0008,1140)	List of all the images in the series.

Attribute	Tag	Notes
>>Referenced SOP Class UID	(0008,1150)	The SOP class UID can be one of: Ultrasound Image Storage 1.2.840.10008.5.1.4.1.1.6.1 Ultrasound Image Storage (Retired) 1.2.840.10008.5.1.4.1.1.6 Secondary Capture Image Storage 1.2.840.10008.5.1.4.1.1.7
>>Referenced SOP Instance UID	(0008,1155)	The SOP instance UID of the image.
> Referenced Standalone SOP Instance Sequence	(0040,0220)	Always empty

4.3.6 Real-World Activity - Storage Commitment

This operation allows the AE to create an instance of the Storage Commitment SOP Class and to provide information about a specific Real World Activity that is under the control of the SCU. The AE invokes a request for safekeeping of images by the N-ACTION REQUEST. Referenced in the N-ACTION Request are the SOP class UID(s) and SOP instance UID(s) for all STORE Class objects requesting commitment by the SCU.

Storage Commit

The Storage Commitment (if enabled) command is sent in the following situations:

a. On series close, when all images and Structured Reports have previously stored successfully.

b. The series was previously closed, all previous stores have succeeded and the last image or Structured Report stores successfully.

c. The series was previously closed, at least one store has succeeded, at least one store has failed and the last store with non-zero retry count fails or succeeds.

d. A series has been partially committed as in c. Later, due to "Retry Job" button press on the Store Status UI screen the store jobs are retried. Another Storage Commit is sent when at least one store has succeeded and the last store with non-zero retry count fails or succeeds.

The SONOVISTA FX waits for the return of a successful N-ACTION RESPONSE Status Code applicable for the associated request indicating whether the commitment request was successful or a failure. The SONOVISTA FX waits for the N-EVENT REPORT from the SCP for at most 48 hours. The SONOVISTA FX is capable of accepting the N-EVENT REPORT on the association it initiates for the N-ACTION or one initiated by the SCP. Studies with all SOP instances marked as ‘successful’ in the N-EVENT REPORT will be eligible for deletion from the system hard drive.

The SONOVISTA FX allows the user to configure a Storage Commitment Server which may be different from the Storage Server. Thus, the Storage Commitment SCP must wait for an appropriate time for the stored images to arrive from the Storage server.

Image-By-Image and Batch Storage Commitment are supported as specified in “Vista DICOM Conformance Requirements for Image Modalities in radiology, Cardiology, Dental, Ophthalmology and other specialities” (Version 2.3).

Storage Commitment of Structured Reports is supported.

Proposed Presentation Context

Table 35: Storage Commitment Presentation Context Table

		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

The SONOVISTA FX system will act as an SCU in the ‘Push Model” Storage Commitment SOP Class.

SOP Specific Conformance to Storage Commitment SOP Class

The Storage Commitment AE provides conformance to the following DICOM Service SOP Class as an SCU at a standard level of conformance.

Table 36: Supported SOP Class

Supported SOP Class Name	SOP Class UID	Conformance Level
Storage Commitment Push Model	1.2.840.10008.1.20.1	Standard

Storage Commitment to Storage Media (CD) is not supported.

The following table provides the list of attributes supported by the AE in the implementation of Storage Commitment SOP Class:

Table 37: Storage Commitment Request Attributes in N-ACTION REQUEST

Attribute	Tag	Notes
Transaction UID	(0008,1195)	Generated by FX
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	

Error Handling

If the storage commitment operation is not successful, a user-configured number of additional attempts are made. If these attempts fail, the user must select the job and press “Retry Job” on the DICOM Store Queue page to complete the storage commitment operation.

5.0 Removable Media Interchange Specifications

This implementation supports 120mm CD and DVD medium.

5.1 Supported Application Profiles

SONOVISTA FX provides standard conformance to the following four Ultrasound Application Profiles. A DICOM 3.0 conformant DICOMDIR file is created together with the directory structures and image files.

Table 38: Application Profiles, Real-World Activities, and Roles

Supported AP	Real-World Activity	Roles	SC Option
STD-US-ID-SF-CDR	Create CD-R	FSC, FSR	Interchange
STD-US-SC-SF-CDR	Create CD-R	FSC	Interchange
STD-US-ID-SF-DVD	Create DVD	FSC, FSR	Interchange
STD-US-SC-SF-DVD	Create DVD	FSC	Interchange

5.2 Supported SOP Classes

5.2.1 Supported SOP Classes and Transfer Syntaxes

This implementation provides standard conformance to the following DICOM 3.0 SOP Classes.

Table 39: Transfer Syntaxes for Media Interchange

Service SOP Class Name	SOP Class UID	Transfer Syntax Name	Transfer Syntax UID List
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1

5.3 Information Object Definition and DICOMDIR Keys

5.3.1 DICOM File Meta Information

The following table denotes the attributes included in the Ultrasound Image Object as implemented on the SONOVISTA FX in addition to the attributes listed in Table 6.

Table 40: US Image Attributes Used (Refer Table 6 for additional attributes used)

Attribute Name	Tag	Notes

Attribute Name	Tag	Notes
File Preamble	No Tag or Length fields	All bytes are set to 00H
DICOM Prefix	No Tag or Length fields	Set to DICOM Prefix “DICM”
Group length	(0002,0000)	
File Meta Information Version	(0002,0001)	Always set to 0001H
Media Storage SOP Class UID	(0002,0002)	Always Ultrasound Image 1.2.840.10008.5.1.4.1.1.6.1
Media Storage SOP Instance UID	(0002,0003)	
Transfer Syntax UID	(0002,0010)	Always Explicit VR Little Endian 1.2.840.10008.1.2.1
Implementation Class UID	(0002,0012)	Always set to 1.3.12.2.1107.5.5.5
Implementation Version Name	(0002,0013)	Always set to MergeCOM3_351

The following table denotes the attributes included in the Comprehensive SR Object as implemented on the SONOVISTA FX in addition to the attributes listed in Table 12.

Table 41: Comprehensive SR Attributes Used (Refer Table 12 for additional attributes used)

Attribute	Tag	Notes
File Preamble	No Tag or Length fields	All bytes are set to 0
DICOM Prefix	No Tag or Length fields	Set to “DICM”
Group length	(0002,0000)	
File Meta Information Version	(0002,0001)	Always set to 0001H
Media Storage SOP Class UID	(0002,0002)	Always Comprehensive SR 1.2.840.10008.5.1.4.1.1.88.33
Media Storage SOP Instance UID	(0002,0003)	
Transfer Syntax UID	(0002,0010)	Always Explicit VR Little Endian 1.2.840.10008.1.2.1
Implementation Class UID	(0002,0012)	Always set to 1.3.12.2.1107.5.5.5
Implementation Version Name	(0002,0013)	Always set to MergeCOM3_351

5.3.2 Basic Directory Information Object Definitions - File-set Identification Module

Attribute	Tag	Notes
File-Set ID	(0004,1130)	Set to serial number + YYMMDD + 3 digit counter. Volume Label has this same value.

5.3.3 Basic Directory Information Object Definitions - Directory Identification Module

Attribute	Tag	Notes
Offset of the First Directory Record of the Root Directory Entry	(0004,1200)	
Offset of the Last Directory Record of the Root Directory Entry	(0004,1202)	
File-set Consistency Flag	(0004,1212)	
Directory Record Sequence	(0004,1220)	
>Offset of the Next Directory Record	(0004,1400)	
>Record In-use Flag	(0004,1410)	
>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	
>Directory Record Type	(0004,1430)	
>Referenced File ID	(0004,1500)	
>Referenced SOP Class UID in File	(0004,1510)	
>Referenced SOP Instance UID in File	(0004,1511)	

5.3.4 Physical Storage Media and Media Formats

The physical storage media supported are 120mm CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, and DVD+RW medium.

6.0 Communication Profiles

All SONOVISTA FX system application entities utilize the DICOM 3.0 TCP/IP communication support as defined in PS3.8 (Part 8) of the DICOM 3.0 Standard.

6.1 TCP/IP Stack Supported

Each process inherits its TCP/IP stack from the SONOVISTA FX's operating systems TCP/IP stack. The local AE Port number is always set to 104.

6.2 Physical Media Supported

Standard representations of IEEE 802.3 10BaseT/100BaseT ("twisted pair") is supported

6.3 Chapter Extensions/Specializations/Privatizations

Pixel Spacing information is only provided for single, full screen, and 2D image types (B-mode, B-mode with color, and B-mode with power).

Appendix A lists the DICOM SR mappings used by the SONOVISTA FX AE in Obstetric Structured Reports. All private concept names use the Coding Scheme Designator "99SIEMENS".

7.0 Configuration

SONOVISTA FX Networking and DICOM parameters can be configured through the SONOVISTA FX System Presets Menu screens. The following configuration is supported:

- General system
- Network (local and remote)
- DICOM Store
- DICOM Print
- DICOM Modality Worklist
- DICOM Storage Commitment
- DICOM Modality Performed Procedure Step

7.1 General System Configuration

The following system parameter can be configured via the SONOVISTA FX System Presets Basic Menu screens. This parameter is mapped to a DICOM image attribute:

- Hospital Name

7.1.1 Hospital Name

The user can enter the organization (i.e. hospital, clinic, etc.) as a text string in the Hospital Name field of the System Presets - General menu. The Organization Name field is transferred to DICOM devices as Institution Name - DICOM data element (0008, 0080).

7.2 DICOM Network Configuration

DICOM and networking parameters can be configured for both the local SONOVISTA FX device and remote DICOM service class providers through the System Presets DICOM Menu.

7.2.1 Local

The SONOVISTA FX local network parameters are configurable. The following network parameters can be configured for a SONOVISTA FX device:

- Host Name
- IP address
- Subnet IP mask
- Default Gateway
- DICOM Application Entity Title

7.2.2 Remote

Multiple DICOM service class providers can be configured through the system presets. The following network parameters can be configured for each remote device:

- DICOM Device Application Entity Title
- IP address
- Port Number

7.2.2.1 DICOM Store Configuration

Several configuration settings are provided in addition to those described in Section 7.2.2.

The Image Format setting provides control over the Presentation Contexts proposed during Association negotiation. This is documented in Section Association Establishment Order.

Configuration options are provided to control the Photometric Interpretation of grayscale images stored to a DICOM Store SCP. Grayscale images can be stored as RGB, YBR-FULL-422 or MONOCHROME2.

Many SONOVISTA FX B-Mode and M-Mode images contain no significant color, the only color is in the Siemens‘s’ transducer position marker and the ECG trace, if used. When “Store grayscale images as Monochrome” is selected, single-frame images with no significant color content will be stored as MONOCHROME2. When “Store grayscale images as Monochrome” is selected, all images are stored as RGB or YBR-FULL-422.

7.2.2.2 DICOM Storage Commitment Configuration

Configuration of DICOM Storage Commitment remote devices must be performed separately from DICOM Store Configuration. The SONOVISTA FX supports Storage Commitment to the same remote device as Store or to a different device.

7.2.2.3 DICOM Modality Worklist Configuration

Configuration of DICOM Modality Worklist remote devices is enabled in FX.

7.2.2.4 DICOM Modality Performed Procedure Step Configuration

Configuration of DICOM Modality Performed Procedure Step remote devices must be performed separately from DICOM Modality Worklist Configuration. The SONOVISTA FX supports MPPS to the same remote device as Modality Worklist or to a different device.

The “Store Image Format” setting controls the Referenced SOP Class UID (0008,1150) in the Referenced Image Sequence (0008,1140) of the MPPS N-SET sent by the SONOVISTA FX. Due to the SONOVISTA FX’s ability to select from multiple Presentation Contexts during Association Negotiation, it is necessary to use this setting.

In the majority of installations the “Store Image Format” should be left at the default setting of “New Ultrasound”. There are two cases when the “Store Image Format” must be set to “Old Ultrasound” or “Secondary Capture”:

- When the active Storage Server “Image Format” is set to “Old Ultrasound” or “Secondary Capture”.
- When the active Storage Server “Image Format” is set to “Automatic”, but the Storage Server does not support US Image.

In both cases the correct setting can be determined by reviewing the DICOM Conformance Statement of the Storage Server and following the instructions below. DICOM Conformance Statements are usually available on the manufacturer’s Web site.

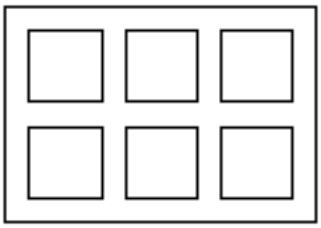
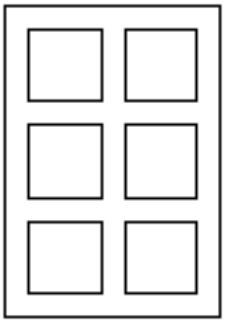
- If US Image is listed in the DICOM Conformance Statement and the active Storage Server “Image Format” is set to “Automatic” then “New Ultrasound” is the correct setting for “Store Image Format”.
- If the above is not true and at least US Image (Retired) is listed in the DICOM Conformance Statement then “Old Ultrasound” is the correct setting for “Store Image Format”.
- If neither of the above are true then “Secondary Capture” is the correct setting for “Store Image Format”.

7.2.2.5 DICOM Print Configuration

For each DICOM Print server, the following data is configurable by the user using the System Presets DICOM Print User Interface. The effect of changing parameters of the DICOM Print server will be seen at the next created film sheet. The current film sheet is not affected by changing these parameters.

Table 42: User-Configurable Printer Parameters

Parameter	Description
Printer Type:	Color or Black and White - depends on printer
Film Size	Select the size of the film - 8x10 inches, 8.5x11 inches, 10x12 inches, 10x14 inches, 11x14 inches, 11x17 inches, 14x14 inches, 14x17 inches, 24x24 centimeters, 24x30 centimeters, A3, or A4.
Film Orientation	Select from Portrait:  or Landscape: 

Display Format	You must supply the number of rows and columns of images on the printed sheet. For example, a 6 on 1 print with Landscape mode should have 3 columns and 2  rows: A 6 on 1 with Portrait mode would have 2 columns and 3  rows:
Print Priority	HIGH, MEDIUM or LOW
Medium Type	PAPER, CLEAR FILM, BLUE FILM, TRANSPARENCY or CURRENT (to use the currently loaded media)
Film Destination	MAGAZINE, PROCESSOR or CURRENT
Max. Density	Used to define the Black value - printer specific
Min. Density	Used to define the White value - printer specific
Smoothing Type	Printer specific value
Border Density	BLACK or WHITE
Empty Image Density	BLACK or WHITE
Trim	YES/NO to having a border around each image
Polarity	Normal/reverse. Normal means black is printed as black. Reverse means the grayscale is inverted so that black comes out as white and white as black.
Magnification	Replicate, Bilinear, Cubic, None
Configuration Information:	Printer Specific values

7.3 Support of Extended Character Sets

The “ISO 2022 IR 13\\ISO 2022 IR 87” character sets are supported by the SONOVISTA FX system.

8.0 Security

8.1 Security Profiles

None supported.

8.2 Association Level Security

None supported.

8.3 Application Level Security

None supported.

8.4 Virus Protection

The SONOVISTA FX computer system's networking has been configured to significantly reduce the possibility of virus and hacking vulnerabilities. On the FX computer system, all ingress TCP and UDP ports are closed and/or absent of any type of server. The only exception to this is due to the necessity of a DICOM server available at ingress TCP port 104. Additionally, all non-essential computer services and components are disabled to minimize FX egress network footprint.

Outside of some minimal network exchanges required by the FX's commercial computer operating system, the only network connections initiated by the FX are for DICOM connectivity and network-share export function.

9.0 Appendix A: OB-GYN Structured Report Measurements

This appendix lists the DICOM Structured Report (SR) mappings used in the Obstetric and Gynecologic Structured Reports of FX DICOM SR files.

The mappings are organized in a manner similar to the DICOM SR Templates as described in PS 3.16-2004 of the DICOM Standard. The "Label" column identifies the on-screen label associated with a measurement. All private code values use the Coding Scheme Designator "SIEMENS".

The OB-GYN Report mappings follow the DICOM SR Template TID 5000: OB-GYN Ultrasound Procedure Report, except where noted. Ovaries and Follicles are private sections in this release.

Notation:

< … > indicates that the description is not the actual text displayed
[…] is additional information

TID5000: OB-GYN Ultrasound Procedure Report

9.1 Patient Characteristics

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Patient Characteristics	Container: Patient Characteristics (DCM, 121118)		
Height	Patient Height (LN, 8302-2)		
Weight	Patient Weight (LN, 29463-7)		
Gravida	Gravida (LN, 11996-6)		
Para	Para (LN, 11977-6)		
AB	Aborta (LN, 11612-9)		
Ectopic	Ectopic Pregnancies (LN, 33065-4)		
LMP	IVF Date Time (SIEMENS, IVFDateTime)		

9.2 OB-GYN Summary

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
OB-GYN Summary	Container: Summary (DCM, 121111)		
LMP	LMP (LN, 11955-2)		

9.3 Fetus Summary

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Fetus Summary	Container: Fetus Summary (DCM, 125008)		
Gestational Age	Gestational Age (LN, 18185-9)		
US MA, MA Based ON (AVERAGE)	Composite Ultrasound Age (LN, 11888-5)		
US MA, MA Based ON (<Author Label>	Composite Ultrasound Age (LN, 11888-5)	<Composite Ultrasound Age Author Information>	
Estimated Fetal Weight: EFW1 <Author>	Estimated Weight (LN, 11727-5)	<EFW Author Information>	
	2 Sigma Upper Value of Population (SRT, R-00387)		Estimated Weight (LN, 11727-5) <EFW Author Information>
	2 Sigma Lower Value of Population (SRT, R-00388)		Estimated Weight (LN, 11727-5) <EFW Author Information>
Estimated Fetal Weight: EFW2 (<Author Label>)	Estimated Weight (LN, 11727-5)	<EFW Author Information>	
	2 Sigma Upper Value of Population (SRT, R-00387)		Estimated Weight (LN, 11727-5) <EFW Author Information>
	2 Sigma Lower Value of Population (SRT, R-00388)		Estimated Weight (LN, 11727-5) <EFW Author Information>

9.3.1 Composite Ultrasound Age Authors

Author Label	Composite Ultrasound Age Author Information	Comments
Hadlock1	Equation: Ultrasound MA Hadlock1 (SIEMENS, USMAHadlock1)	
Hadlock2	Equation: Ultrasound MA Hadlock2 (SIEMENS, USMAHadlock2)	
Hadlock3	Equation: Ultrasound MA Hadlock3 (SIEMENS, USMAHadlock3)	
Hadlock4	Equation: Ultrasound MA Hadlock4 (SIEMENS, USMAHadlock4)	
Hadlock5	Equation: Ultrasound MA Hadlock5 (SIEMENS, USMAHadlock5)	
Hadlock6	Equation: Ultrasound MA Hadlock6 (SIEMENS, USMAHadlock6)	
Hadlock7	Equation: Ultrasound MA Hadlock7 (SIEMENS, USMAHadlock7)	
Hadlock8	Equation: Ultrasound MA Hadlock8 (SIEMENS, USMAHadlock8)	
Hadlock9	Equation: Ultrasound MA Hadlock9 (SIEMENS, USMAHadlock9)	
Hadlock10	Equation: Ultrasound MA Hadlock10 (SIEMENS, USMAHadlock10)	
Hadlock11	Equation: Ultrasound MA Hadlock11 (SIEMENS, USMAHadlock11)	

9.3.2 EFW Authors

Author Label	EFW Author Information	Population Statistical Descriptors
HANSMANN (BPD, ATC)	Equation: EFW by BPD, TTD, Hansmann 1986 (LN, 33139-7)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
OSAKA (BPD, FTA, FL)	Equation: EFW by BPD, FTA, FL, Osaka 1990 (LN, 33140-5)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
SHEPARD (AC, BPD)	Equation: EFW by AC, BPD, Shepard 1982 (LN, 11739-0)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
TOKYO (BPD, APAD, TAD, FL)	Equation: EFW by BPD, APAD, TAD, FL, Tokyo 1987 (LN, 33144-7)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
HADLOCK1 (AC, FL)	Equation: EFW by AC, FL, Hadlock 1984 (LN, 11750-7)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
HADLOCK2 (BPD, AC, FL)	Equation: EFW by AC, BPD, FL, Hadlock 1985 (LN, 11735-8)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
HADLOCK3 (HC, AC, FL)	Equation: EFW by AC, FL, HC, Hadlock 1985 (LN, 11746-5)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
HADLOCK4 (BPD, HC, AC, FL)	Equation: EFW by AC, BPD, FL, HC, Hadlock 1985 (LN, 11732-5)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
JSUM (BPD, AC, FL)	Equation: EFW JSUM (SIEMENS, EFWJSUM)	No Population Statistical Description
MERZ (BPD, AC)	Equation: EFW Merz (SIEMENS, EFWMerz)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)

9.3.3 EFW Gestational Age Authors

Author Label	EFW Gestational Age Author Information	Population Statistical Descriptors
Tokyo(BPD, APAD, TAD, FL)	Equation: EFW1 MA Tokyo (SIEMENS, MAEFW1Tokyo)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
Osaka(BPD, FTA, FL)	Equation: EFW1 MA Osaka (SIEMENS, MAEFW1Osaka)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
JSUM(BPD, AC, FL)	Equation: EFW1 MA JSUM (SIEMENS, MAEFW1JSUM)	No Population Statistical Descriptors
Tokyo(BPD, APAD, TAD, FL)	Equation: EFW2 MA Tokyo (SIEMENS, MAEFW2Tokyo)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
Osaka(BPD, FTA, FL)	Equation: EFW2 MA Osaka (SIEMENS, MAEFW2Osaka)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
JSUM(BPD, AC, FL)	Equation: EFW2 MA JSUM (SIEMENS, MAEFW2JSUM)	No Population Statistical Descriptors

9.4 Fetal Biometry Ratios

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Fetal Biometry Ratios	Container: Fetal Biometry Ratios (DCM, 125001)		
Ratio: HC/AC, <Value> (<Lower Limit> – <Upper Limit>), CAMPBELL	HC/AC Campbell (SIEMENS, HCACCampbell)	Equation: HC/AC Campbell (SIEMENS, HCACCampbell)	
	Normal Range Upper Limit (SRT, R-0038B)		HC/AC Campbell (SIEMENS, HCACCampbell)
	Normal Range Lower Limit (SRT, R-10041)		HC/AC Campbell (SIEMENS, HCACCampbell)
Ratio: FL/AC, <Value> (<Lower Limit> – <Upper Limit>), HADLOCK	FL/AC Hadlock (SIEMENS, FLACHadlock)	Equation: FL/AC Hadlock (SIEMENS, FLACHadlock)	
	Normal Range Upper Limit (SRT, R-0038B)		FL/AC Hadlock (SIEMENS, FLACHadlock)
	Normal Range Lower Limit (SRT, R-10041)		FL/AC Hadlock (SIEMENS, FLACHadlock)
Ratio: FL/BPD, <Value> (<Lower Limit> – <Upper Limit>), HOHLER	FL/BPD Hohler (SIEMENS, FLBPDHohler)	Equation: FL/BPD Hohler (SIEMENS, FLBPDHohler)	
	Normal Range Upper Limit (SRT, R-0038B)		FL/BPD Hohler (SIEMENS, FLBPDHohler)
	Normal Range Lower Limit (SRT, R-10041)		FL/BPD Hohler (SIEMENS, FLBPDHohler)
Ratio: TCD/AC, <Value> (<Lower Limit> – <Upper Limit>), MEYER	TCD/AC Meyer (SIEMENS, TCDACMeyer)	Equation: TCD/AC Meyer (SIEMENS, TCDACMeyer)	
	Normal Range Upper Limit (SRT, R-0038B)		TCD/AC Meyer (SIEMENS, TCDACMeyer)
	Normal Range Lower Limit (SRT, R-10041)		TCD/AC Meyer (SIEMENS, TCDACMeyer)
Ratio: LVW/HW, <Value> (<Lower Limit> – <Upper Limit>), JOHNSON	LVW/HW Johnson (SIEMENS, LVWHWJohnson)	Equation: LVW/HW Johnson (SIEMENS, LVWHWJohnson)	
	Normal Range Upper Limit (SRT, R-0038B)		LVW/HW Johnson (SIEMENS, LVWHWJohnson)
	Normal Range Lower Limit (SRT, R-10041)		LVW/HW Johnson (SIEMENS, LVWHWJohnson)
Ratio: CI, <Value> (<Lower Limit> – <Upper Limit>), HADLOCK	CI Ratio Hadlock (SIEMENS, CIHadlock)	Equation: CI Ratio Hadlock (SIEMENS, CIHadlock)	
	Normal Range Upper Limit (SRT, R-0038B)		CI Ratio Hadlock (SIEMENS, CIHadlock)
	Normal Range Lower Limit (SRT, R-10041)		CI Ratio Hadlock (SIEMENS, CIHadlock)

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Ratio: CI, <Value> (<Lower Limit> – <Upper Limit>), CHITTY	CI Ratio Chitty (SIEMENS, CIChitty)	Equation: CI Ratio Chitty (SIEMENS, CIChitty)	
	Normal Range Upper Limit (SRT, R-0038B)		CI Ratio Chitty (SIEMENS, CIChitty)
	Normal Range Lower Limit (SRT, R-10041)		CI Ratio Chitty (SIEMENS, CIChitty)

9.5 Fetal Biometry Measurements

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Fetal Biometry Measurements	Container: Fetal Biometry (DCM, 125002)		
Measurement: AC, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Abdominal Circumference (LN, 11979-2)		
	Gestational Age (LN, 18185-9)	<AC Gestational Age Author Information>	Abdominal Circumference (LN, 11979-2)
	1 Sigma Upper Value of Population (SRT, R-00346)		Gestational Age (LN, 18185-9) Abdominal Circumference (LN, 11979-2) <AC Gestational Age Author Information>
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) Abdominal Circumference (LN, 11979-2) <AC Gestational Age Author Information>
	2 Sigma Upper Value of Population (SRT, R-00387)		Gestational Age (LN, 18185-9) Abdominal Circumference (LN, 11979-2) <AC Gestational Age Author Information>
	2 Sigma Lower Value of Population (SRT, R-00388)		Gestational Age (LN, 18185-9) Abdominal Circumference (LN, 11979-2) <AC Gestational Age Author Information>
Measurement: APTD, <Value>	Anterior-Posterior Trunk Diameter (LN, 11819-0)		
Measurement: ASD, <Author Label>, <Gestational Age>, <Value>	Anterior-Posterior Abdominal Diameter (LN, 11818-2)		
<Author Label>: MERZ	Gestational Age (LN, 18185-9)	Equation: ASD MA Merz (SIEMENS, ASDMAMerz)	

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Measurement: ATD, <Author Label>, <Gestational Age>, <Value>	Transverse Abdominal Diameter (LN, 11818-2)		
<Author Label>: MERZ	Gestational Age (LN, 18185-9)	Equation: ATD MA Merz (SIEMENS, ATDMAMerz)	Transverse Abdominal Diameter (LN, 11818-2)
Measurement: BPD, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Biparietal Diameter (LN, 11820-8)		
	Gestational Age (LN, 18185-9)	<BPD Gestational Age Author Information>	Biparietal Diameter (LN, 11820-8)
	1 Sigma Upper Value of Population (SRT, R-00346)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
	2 Sigma Upper Value of Population (SRT, R-00387)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
	2 Sigma Lower Value of Population (SRT, R-00388)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
Measurement: CorBPD, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	BPD Area Corrected (LN, 11824-0)		
	1 Sigma Upper Value of Population (SRT, R-00346)		Gestational Age (LN, 18185-9) BPD Area Corrected (LN, 11824-0) <BPD Gestational Age Author Information>
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) BPD Area Corrected (LN, 11824-0) <BPD Gestational Age Author Information>
	2 Sigma Upper Value of Population (SRT, R-00387)		Gestational Age (LN, 18185-9) BPD Area Corrected (LN, 11824-0) <BPD Gestational Age Author Information>

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
	2 Sigma Lower Value of Population (SRT, R-00388)		Gestational Age (LN, 18185-9) BPD Area Corrected (LN, 11824-0) <BPD Gestational Age Author Information>
Measurement: FL, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Femur Length (LN, 11963-6)		
	Gestational Age (LN, 18185-9)	<FL Gestational Age Author Information>	Femur Length (LN, 11963-6)
	1 Sigma Upper Value of Population (SRT, R-00346)		Gestational Age (LN, 18185-9) Femur Length (LN, 11963-6) <FL Gestational Age Author Information>
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) Femur Length (LN, 11963-6) <FL Gestational Age Author Information>
	2 Sigma Upper Value of Population (SRT, R-00387)		Gestational Age (LN, 18185-9) Femur Length (LN, 11963-6) <FL Gestational Age Author Information>
	2 Sigma Lower Value of Population (SRT, R-00388)		Gestational Age (LN, 18185-9) Femur Length (LN, 11963-6) <FL Gestational Age Author Information>
Measurement: FT, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Foot Length (LN, 11965-1)		
<Author Label>: MERCER	Gestational Age (LN, 18185-9)	Equation: Foot Length, Mercer 1987 (LN, 11926-3)	Foot Length (LN, 11965-1)
	2 Sigma Upper Value of Population (SRT, R-00387)		Gestational Age (LN, 18185-9) Foot Length (LN, 11965-1) Equation: Foot Length, Mercer 1987 (LN, 11926-3)
	2 Sigma Lower Value of Population (SRT, R-00388)		Gestational Age (LN, 18185-9) Foot Length (LN, 11965-1) Equation: Foot Length, Mercer 1987 (LN, 11926-3)
Measurement: FTA, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Thoracic Area (LN, 33068-8)		

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
<Author Label>: OSAKA	Gestational Age (LN, 18185-9)	Equation: FTA MA Osaka (SIEMENS, FTAMAOsaka)	Thoracic Area (LN, 33068-8)
Measurement: HC, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Head Circumference (LN, 11984-2)		
	Gestational Age (LN, 18185-9)	<HC Gestational Age Author Information>	Head Circumference (LN, 11984-2)
	2 Sigma Upper Value of Population (SRT, R-00387)		Gestational Age (LN, 18185-9) Head Circumference (LN, 11984-2) <HC Gestational Age Author Information>
	2 Sigma Lower Value of Population (SRT, R-00388)		Gestational Age (LN, 18185-9) Head Circumference (LN, 11984-2) <HC Gestational Age Author Information>
Measurement: OFD, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Occipital-Frontal Diameter (LN, 11851-3)		
<Author Label>: ASUM	Gestational Age (LN, 18185-9)	Equation: OFD, ASUM 2000 (LN, 33119-9)	Occipital-Frontal Diameter (LN, 11851-3)
<Author Label>: MERZ	Gestational Age (LN, 18185-9)	Equation: OFD MA Merz (SIEMENS, OFDMAMerz)	Occipital-Frontal Diameter (LN, 11851-3)
Measurement: TC, <Value>	Thoracic Circumference (LN, 11988-3)		
Measurement: TTD, <Value>	Transverse Thoracic Diameter (LN, 11864-6)		
Measurement: AXT, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	APAD * TAD (LN, 33191-8)		
<Author Label>: TOKYO	Gestational Age (LN, 18185-9)	Equation: AXT MA Tokyo (SIEMENS, MAAXTTokyo)	APAD * TAD (LN, 33191-8)
	1 Sigma Upper Value of Population (SRT, R-00346)		Gestational Age (LN, 18185-9) APAD * TAD (LN, 33191-8) Equation: AXT MA Tokyo (SIEMENS, MAAXTTokyo)

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) APAD * TAD (LN, 33191-8) Equation: AXT MA Tokyo (SIEMENS, MAAXTTokyo)
Measurement: Left RL, <Value>	Left Kidney Length (LN, 11834-9)		
Measurement: Left RAP, <Value>	Left Kidney Thickness (LN, 11853-9)		
Measurement: Right RL, <Value>	Right Kidney Length (LN, 11836-4)		
Measurement: Right RAP, <Value>	Right Kidney Thickness (LN, 11855-4)		

9.5.1 AC Gestational Age Authors

Author Label	AC Gestational Age Author Information	Population Statistical Descriptors
HADLOCK	Equation: AC, Hadlock 1984 (LN, 11892-7)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
MERZ	Equation: AC, Mertz 1988 (LN, 33075-3)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
LASSER	Equation: AC MA Lasser (SIEMENS, ACMALasser)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
JSUM	Equation: AC MA JSUM (SIEMENS, ACMAJSUM)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)

9.5.2 BPD Gestational Age Authors

Author Label	BPD Gestational Age Author Information	Population Statistical Descriptors
ASUM	Equation: BPD, ASUM 1989 (LN, 33079-5)	No Population Statistical Descriptors
HADLOCK	Equation: BPD, Hadlock 1984 (LN, 11902-4)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
MERZ	Equation: BPD, Mertz 1988 (LN, 33081-1)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
REMPEN	Equation: BPD, Rempen 1991 (LN, 33083-7)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
TOKYO	Equation: BPD, Tokyo 1986 (LN, 33085-2)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)

Author Label	BPD Gestational Age Author Information	Population Statistical Descriptors
OSAKA	Equation: BPD, Osaka 1989 (LN, 33082-9)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
JSUM	Equation: BPD MA JSUM (SIEMENS, BPDMAJSUM)	1 Sigma Upper Value of population (SRT, R-00346)
LASSER	Equation: BPD MA Lasser (SIEMENS, BPDMALasser)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)

9.5.3 BPD Area Corrected Gestational Age Authors

Author Label	BPD Area Corrected Gestational Age Author Information	Population Statistical Descriptors
HADLOCK	Equation: BPD, Hadlock 1984 (LN, 11902-4)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
MERZ	Equation: BPD, Mertz 1988 (LN, 33081-1)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
REMPEN	Equation: BPD, Rempen 1991 (LN, 33083-7)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
ASUM	Equation: BPD, ASUM 1989 (LN, 33079-5)	No Population Statistical Descriptors
TOKYO	Equation: BPD, Tokyo 1986 (LN, 33085-2)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
OSAKA	Equation: BPD, Osaka 1989 (LN, 33082-9)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
JSUM	Equation: CorBPD MA JSUM (SIEMENS, CorBPDJsum)	1 Sigma Upper Value of population (SRT, R-00346)
LASSER	Equation: CorBPD MA Lasser (SIEMENS, CorBPDLasser)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)

9.5.4 FL Gestational Age Authors

Author Label	FL Gestational Age Author Information	Population Statistical Descriptors
JEANTY	Equation: FL, Jeanty 1984 (LN, 11923-0)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
HADLOCK	Equation: FL, Hadlock 1984 (LN, 11920-6)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
MERZ	Equation: FL, Merz 1988 (LN, 33542-2)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
TOKYO	Equation: FL, Tokyo 1986 (LN, 33103-3)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
OSAKA	Equation: FL, Osaka 1989 (LN, 33101-7)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)

Author Label	FL Gestational Age Author Information	Population Statistical Descriptors
JSUM	Equation: FL MA JSUM (SIEMENS, FLMAJSUM)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)

9.5.5 HC Gestational Age Authors

Author Label	HC Gestational Age Author Information	Population Statistical Descriptors
HADLOCK	Equation: HC, Hadlock 1984 (LN, 11932-1)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
MERZ	Equation: HC, Merz 1988 (LN, 33115-7)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
LASSER	Equation: HC MA Lasser (SIEMENS, HCMALasser)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)

9.6 Fetal Long Bones Biometry Measurements

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Fetal Long Bones Biometry Measurements	Container: Fetal Long Bones (DCM, 125003)		
CL, <Value>	Clavicle Length (LN, 11962-8)		
HL, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Humerus Length (LN, 11966-9)		
<Author Label>: JEANTY	Gestational Age (LN, 18185-9)	Equation: Humerus, Jeanty 1984 (LN, 11936-2)	Humerus Length (LN, 11966-9)
	2 Sigma Upper Value of population (SRT, R-00387)		Gestational Age (LN, 18185-9) Humerus Length (LN, 11966-9) Equation: Humerus, Jeanty 1984 (LN, 11936-2)
	2 Sigma Lower Value of population (SRT, R-00388)		Gestational Age (LN, 18185-9) Humerus Length (LN, 11966-9) Equation: Humerus, Jeanty 1984 (LN, 11936-2)
<Author Label>: OSAKA	Gestational Age (LN, 18185-9)	Equation: Humerus Length, Osaka 1989 (LN, 33117-3)	Humerus Length (LN, 11966-9)

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
	1 Sigma Upper Value of population (SRT, R-00346)		Gestational Age (LN, 18185-9) Humerus Length (LN, 11966-9) Equation: Humerus Length, Osaka 1989 (LN, 33117-3)
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) Humerus Length (LN, 11966-9) Equation: Humerus Length, Osaka 1989 (LN, 33117-3)
TL, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Tibia Length (LN, 11968-5)		
<Author Label>: JEANTY	Gestational Age (LN, 18185-9)	Equation: Tibia, Jeanty 1984 (LN, 11941-2)	
	2 Sigma Upper Value of population (SRT, R-00387)		Gestational Age (LN, 18185-9) Tibia Length (LN, 11968-5) Equation: Tibia, Jeanty 1984 (LN, 11941-2)
	2 Sigma Lower Value of population (SRT, R-00388)		Gestational Age (LN, 18185-9) Tibia Length (LN, 11968-5) Equation: Tibia, Jeanty 1984 (LN, 11941-2)
UL, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Ulna Length (LN, 11969-3)		
<Author Label>: JEANTY	Gestational Age (LN, 18185-9)	Equation: Ulna, Jeanty 1984 (LN, 11944-6)	
	2 Sigma Upper Value of population (SRT, R-00387)		Gestational Age (LN, 18185-9) Ulna Length (LN, 11969-3) Equation: Ulna, Jeanty 1984 (LN, 11944-6)
	2 Sigma Lower Value of population (SRT, R-00388)		Gestational Age (LN, 18185-9) Ulna Length (LN, 11969-3) Equation: Ulna, Jeanty 1984 (LN, 11944-6)

9.7 Fetal Cranium

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Fetal Cranium	Container: Fetal Cranium (DCM, 125004)		

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
BN, <Author Label>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Outer Orbital Diameter (LN, 11629-3)		
	Gestational Age (LN, 18185-9)		Outer Orbital Diameter (LN, 11629-3)
	2 Sigma Upper Value of population (SRT, R-00387)		Gestational Age (LN, 18185-9) Outer Orbital Diameter (LN, 11629-3)
	2 Sigma Lower Value of population (SRT, R-00388)		Gestational Age (LN, 18185-9) Outer Orbital Diameter (LN, 11629-3)
HW, <Value>	Width of Hemisphere (LN, 12170-7)		
TCD, <Value>	Trans Cerebellar Diameter (LN, 11863-8)		
LVW, <Value>	Lateral Ventrical Width (LN, 12171-5)		
Cist Magna, <Value>	Cisterna Magna Length (LN, 11860-4)		
NT, <Value>	Nuchal Fold Thickness (LN, 12146-7)		

9.7.1 BN Gestational Age Authors

Author Label	BN Gestational Age Author Information	Population Statistical Descriptors
JEANTY	Equation: BN MA Jeanty (SIEMENS, BNMAJeanty)	2 Sigma Upper Value of population (SRT, R-00387) 2 Sigma Lower Value of population (SRT, R-00388)
TONGSONG	Equation: BN MA Tongsong (SIEMENS, BNMATongsong)	2 Sigma Upper Value of population (SRT, R-00387) 2 Sigma Lower Value of population (SRT, R-00388)

9.8 Amniotic Sac

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Amniotic Sac	Finding Site: Amniotic Sac (SRT, T-F1300)		
AFI	Amniotic Fluid Index (LN, 11627-7)		
Q1	First Quadrant Diameter (LN, 11624-4)		
Q2	Second Quadrant Diameter (LN, 11626-9)		
Q3	Third Quadrant Diameter (LN, 11625-1)		
Q4	Fourth Quadrant Diameter (LN, 11623-6)		

9.9 Early Gestation Biometry Measurements

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Early Gestation Biometry Measurements	Container: Early Gestation (DCM, 125009)		
Early OB: CRL, <Author Label>, <Mean Value>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Crown Rump Length (LN, 11957-8)		
	Gestational Age (LN, 18185-9)	<CRL Author Information>	Crown Rump Length (LN, 11957-8)
	1 Sigma Upper Value of Population (SRT, R-00346)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
	2 Sigma Upper Value of Population (SRT, R-00387)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
	2 Sigma Lower Value of Population (SRT, R-00388)		Gestational Age (LN, 18185-9) Biparietal Diameter (LN, 11820-8) <BPD Gestational Age Author Information>
Early OB: GS, <Author Label>, <Mean Value>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Gestational Sac Diameter (LN, 11850-5)		
<Author Label>: TOKYO	Gestational Age (LN, 18185-9)	Equation: GS, Tokyo 1986 (LN, 33108-2)	Gestational Sac Diameter (LN, 11850-5)
	1 Sigma Upper Value of population (SRT, R-00346)		Gestational Age (LN, 18185-9) Gestational Sac Diameter (LN, 11850-5) Equation: GS, Tokyo 1986 (LN, 33108-2)
	1 Sigma Lower Value of Population (SRT, R-00347)		Gestational Age (LN, 18185-9) Gestational Sac Diameter (LN, 11850-5) Equation: GS, Tokyo 1986 (LN, 33108-2)

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Early OB: MSD, <Author Label>, <Mean Value>, <Gestational Age> ±<Population Statistical Descriptor>, <Value>	Gestational Sac Diameter (LN, 11850-5)		
<Author Label>: REMPEN	Gestational Age (LN, 18185-9)	Equation: GS, Rempen 1991 (LN, 11929-7)	Gestational Sac Diameter (LN, 11850-5)
	2 Sigma Upper Value of population (SRT, R-00387)		Gestational Age (LN, 18185-9) Gestational Sac Diameter (LN, 11850-5) Equation: GS, Rempen 1991 (LN, 11929-7)
	2 Sigma Lower Value of population (SRT, R-00388)		Gestational Age (LN, 18185-9) Gestational Sac Diameter (LN, 11850-5) Equation: GS, Rempen 1991 (LN, 11929-7)
<Author Label>: HELLMAN	Gestational Age (LN, 18185-9)	Equation: GS, Hellman 1969 (LN, 11928-9)	Gestational Sac Diameter (LN, 11850-5)
Early OB: Yolk Sac	Yolk Sac Length (LN, 11816-6)		

9.9.1 CRL Gestational Age Authors

Author Label	CRL Gestational Age Author Information	Population Statistical Descriptors
ASUM	Equation: CRL, ASUM 2000 (LN, 33090-2)	No Population Statistical Descriptors
HADLOCK	Equation: CRL, Hadlock 1992 (LN, 11910-7)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
HANSMANN	Equation: CRL, Hansmann 1986 (LN, 33540-6)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
OSAKA	Equation: CRL, Osaka 1989 (LN, 33093-6)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
ROBINSON	Equation: CRL, Robinson 1975 (LN, 11914-9)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)
TOKYO	Equation: CRL, Tokyo 1986 (LN, 33096-9)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
JSUM	Equation: CRL MA JSUM (SIEMENS, CRLMAJSUM)	1 Sigma Upper Value of Population (SRT, R-00346) 1 Sigma Lower Value of Population (SRT, R-00347)
LASSER	Equation: CRL MA Lasser (SIEMENS, CRLMALasser)	2 Sigma Upper Value of Population (SRT, R-00387) 2 Sigma Lower Value of Population (SRT, R-00388)

9.10 Fetal Biophysical Profile

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Fetal Biophysical Profile	Container: Biophysical Profile (DCM, 125006)		
Movement	Gross Body Movement (LN, 11631-0)		
Breathing	Fetal Breathing (LN, 11632-7)		
Tone	Fetal Tone (LN, 11635-0)		
AFV	Amniotic Fluid Volume (LN, 11630-1)		

9.11 Pelvis and Uterus

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Pelvis and Uterus	Container: Pelvis and Uterus (DCM, 125011)		
Cervix or Cervix Len	Cervix Length (LN, 11961-0)		
Endometrium	Endometrium Thickness (LN, 12145-9)		
Uterus	Container: Uterus (SRT, T-83000)		
Length	Uterus Length (LN, 11842-2)		
Width	Uterus Width (LN, 11865-3)		
Depth	Uterus Height (LN, 11859-6)		

9.12 Pelvic Vasculature

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Pelvic Vasculature	Finding Site: Pelvic Vascular Structure (SRT, T-D6007)		
Doppler: Lt Ovarian A	Location: Ovarian Artery (SRT, T-46980)	Laterality: Left (SRT, G-A101)	
Systole	Peak Systolic Velocity (LN, 11726-7)		
Diastole	End Diastolic Velocity (LN, 11653-3)		
S/D	Systolic to Diastolic Velocity Ratio (LN, 12144-2)		
RI	Resistivity Index (LN, 12023-8)		
PI	Pulsatility Index (LN, 12008-9)		
Doppler: Rt Ovarian A	Location: Ovarian Artery (SRT, T-46980)	Laterality: Right (SRT, G-A100)	

Label Heading: Measurement	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Systole	Peak Systolic Velocity (LN, 11726-7)		
Diastole	End Diastolic Velocity (LN, 11653-3)		
S/D	Systolic to Diastolic Velocity Ratio (LN, 12144-2)		
RI	Resistivity Index (LN, 12023-8)		
PI	Pulsatility Index (LN, 12008-9)		
Doppler: Uterine A	Location: Uterine Artery (SRT, T-F1810)		
Systole	Peak Systolic Velocity (LN, 11726-7)		
Diastole	End Diastolic Velocity (LN, 11653-3)		
S/D	Systolic to Diastolic Velocity Ratio (LN, 12144-2)		
RI	Resistivity Index (LN, 12023-8)		
PI	Pulsatility Index (LN, 12008-9)		
Systole	Peak Systolic Velocity (LN, 11726-7)		
Diastole	End Diastolic Velocity (LN, 11653-3)		
S/D	Systolic to Diastolic Velocity Ratio (LN, 12144-2)		
RI	Resistivity Index (LN, 12023-8)		
PI	Pulsatility Index (LN, 12008-9)		
Measurement: Umb VD	Vessel Lumen Diameter (SRT, G-0364)		

9.13 Fetal Vasculature

Measurement Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Fetal Vasculature	Finding Site: Embryonic Vascular Structure (SRT, T-F6800)		
Location(Proximal, Middle, Distal)	Location: Middle Cerebral Artery (SRT, T-45600)		
Systole	Peak Systolic Velocity (LN, 11726-7)		
Diastole	End Diastolic Velocity (LN, 11653-3)		
S/D	Systolic to Diastolic Velocity Ratio (LN, 12144-2)		
RI	Resistivity Index (LN, 12023-8)		
PI	Pulsatility Index (LN, 12008-9)		

9.14 Private Section: Ovaries

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Ovaries	Container: Ovaries Section (SIEMENS, Ovaries)		
2D-Mode: Lt Ovary, Width	Left Ovary Width (LN, 11829-9)		
2D-Mode: Lt Ovary, Length	Left Ovary Length (LN, 11840-6)		
2D-Mode: Lt Ovary, Depth	Left Ovary Height (LN, 11857-0)		
2D-Mode: Lt Ovary, Volume	Left Ovary Volume (LN, 12164-0)		
2D-Mode: Rt Ovary, Width	Right Ovary Width (LN, 11830-7)		
2D-Mode: Rt Ovary, Length	Right Ovary Length (LN, 11841-4)		
2D-Mode: Rt Ovary, Depth	Right Ovary Height (LN, 11858-8)		
2D-Mode: Rt Ovary, Volume	Right Ovary Volume (LN, 12165-7)		

9.15 Private Sections: Left and Right Follicles

Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers	Measurement References
Follicles <n> = 1 to 15	Container: Follicles Section (SIEMENS, Follicles)	Laterality: Left (SRT, G-A101) or Laterality: Right (SRT, G-A100)	
<Lt or Rt> Follicle, #<n>	Container: Follicle <n> (SIEMENS, Follicle<n>)		
Distance	Follicle Diameter (LN, 11793-7)		
2Dist_Average	Volume (SRT, G-D705)		
3Dist_Average	Follicle Diameter2 Mean (SIEMENS, FollicleDiam2Mn)	Derivation: Mean (SRT, R-00317)	
Area	Follicle Diameter3 Mean (SIEMENS, FollicleDiam3Mn)	Derivation: Mean (SRT, R-00317)	
Circum	Follicle Area (SIEMENS, FollicleArea)		
Volume	Follicle Circumference (SIEMENS, FollicleCircum)		