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	DICOM Conformance Statement	

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DICOM Conformance Statement s5 FFR System



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1 CONFORMANCE STATEMENT OVERVIEW

The s5 and s5i FFR Systems implement the necessary DICOM services to transfer acquired images to a Network storage server device.

Table 2.1-1 provides an overview of the network services supported by the Volcano s5 FFR System.

Table 2.1-1 Networking Services

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Secondary Capture Image Storage	Yes	No

The s5 and s5i FFR Systems implement the necessary DICOM services to write acquired images to a CD/DVD Exchange Media. Table 1-2 provides an overview of the Media Storage Application Profiles and roles supported by the Volcano s5 FFR System.

Table 1-2 Media Services


Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
CD/DVD		
General Purpose CD Interchange (STD-GEN-CD)	FSC	No
General Purpose DVD Interchange with JPEG (STD-GEN-DVD and STD-GEN-DVD-JPEG)	FSC	No

The SOP Classes supported by the Volcano s5 FFR system are categorized in Table 2.1-3

Table 2.1-3 UID Values

UID Value	UID Name	Category
1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage	Transfer

Note: DICOM Modality Worklist and Verification (C-ECHO) Services are only supported on the s5 IVUS application. Attributes acquired from the selected Worklist Scheduled Procedure Step are passed to the s5 FFR application from the s5 IVUS application. See the Volcano s5 DICOM Conformance Statement for more information.

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2 INTRODUCTION

This document describes the Volcano s5 FFR system’s conformance to the ACR-NEMA DICOM (Digital Imaging and Communications in Medicine) standard and satisfies the DICOM requirement for a vendor conformance specification.

The s5 FFR system is an Hemodynamic pressure waveform device used for Fractional Flow Reserve measurements. The DICOM feature of the s5 FFR system provides a means to send images to DICOM storage servers and CD/DVD Exchange Media

This document is written with respect to ACR-NEMA DICOM standard, version 3.0 - 2008.


DICOM Background

The DICOM information exchange specification provides a definitive structure of commands and information that allow for the inter-communication of medical imaging devices. Developed by the American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA), the DICOM standard strives to promote communication of image information through the use of a standardized set of command classes and information semantics.

The DICOM standard defines classes of information that are common to many modalities of medical imaging. However, to meet the specific needs of information content for such a diverse range of information, the DICOM specification defines structures for a multitude of medical data. To alleviate the need for applications to implement every aspect of the DICOM specification, a list of conformance tables for every modality was created to define the minimum set of information necessary for data exchanges. A requirement of the DICOM specification is to maintain a compliance document that outlines a subset of DICOM services and data classes that are supported by a device. The purpose of this document is to define a subset of DICOM for the exchange of information with the Volcano s5 FFR system via its DICOM feature.

2.1 DEFINITIONS

AE	Application Entity
ANSI	American National Standards Institute
CD-R	Compact Disc-Recordable
CIS	Cardiology Information System
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DISTA	DICOM Study Transfer Agent
DVD-R	Digital Versatile Disc- Recordable
FFR	Fractional Flow Reserve
FSC	File Set Creator
FSU	File Set Updater
FSR	File Set Reader
HD	Hemodynamic
HIS	Hospital Information System
IE	Information Entity
IOD	Information Object Definition
KHz	Kilohertz
PACS	Picture Archive and Communication System

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PDU	Protocol Data Unit
SCU	Service Class User (Client)
SCP	Service Class Provider (Server)
SOP	Service – Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
IVUS	Intravascular Ultrasound
VOI	Value Of Interest
VR	Value Representation

2.2 REFERENCE DOCUMENTS

ACR-NEMA DICOM Standard Version 3.0 – 2008

3 NETWORKING

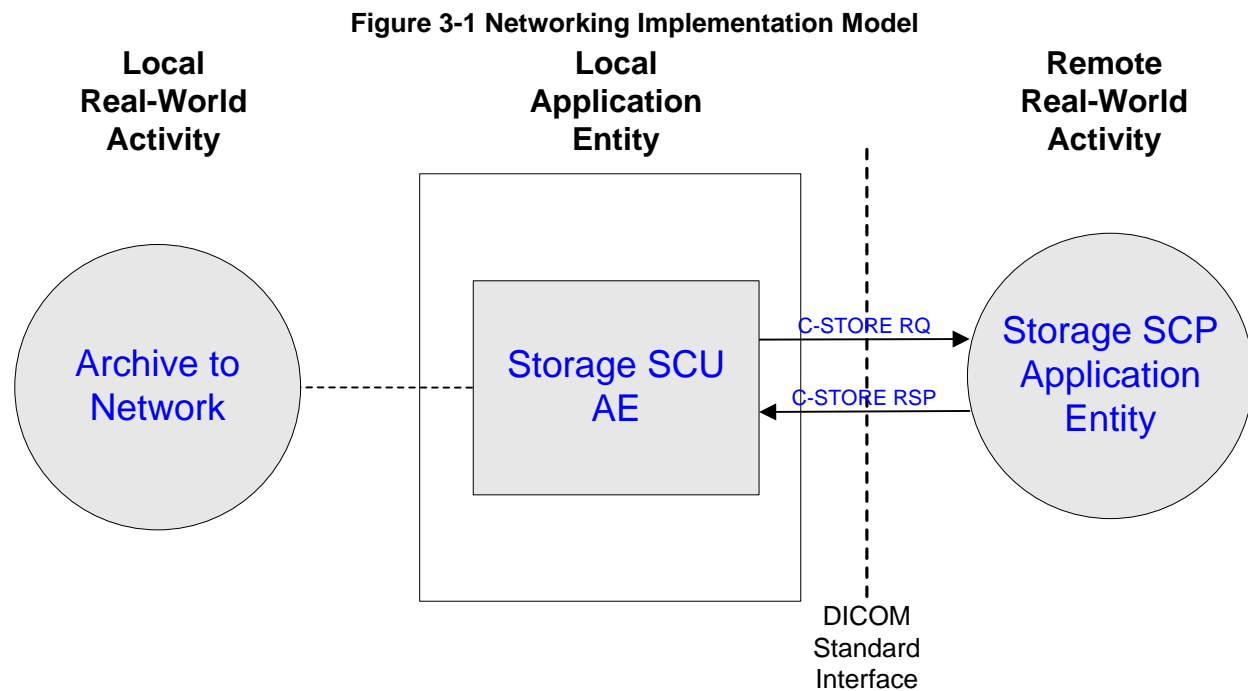
3.1 IMPLEMENTATION MODEL

The s5 FFR DICOM feature incorporates the DICOM 3.0 standard for networked image store functions. Images are transferred from the s5 FFR system using standard network connections to be processed on a DICOM compatible storage device.

DICOM/Network Storage Server Configuration menu is accessed through the s5 IVUS application. The s5 IVUS application allows multiple remote Storage devices to be configured. Images are transferred to the selected remote DICOM storage server, configured in the DICOM/Network Storage Server Configuration menu.

3.1.1 APPLICATION DATA FLOW DIAGRAM


The diagram in Figure 3-1 represents the relationship between the s5 FFR system’s real-world activity (circle on the left), the local AE’s built into the s5 (box in the center), and the remote AE’s built into the devices that the s5 communicates with using DICOM (circle on the right).



The following are the conditions that invoke real-world activities associated with AE’s.

3.1.1.1 ARCHIVE TO NETWORK REAL-WORLD ACTIVITY

Archive to Network real-world activity occurs when the user initiates the Archive to Network function. Only the current active case is transferred to the remote storage server, in a single DICOM Association. The case is transferred to the remote storage server, which is selected through the “Select Server” drop down box located in the s5 IVUS - DICOM/Network configuration menu.

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3.1.2 FUNCTIONAL DEFINITIONS OF AE'S

3.1.2.1 STORAGE SCU AE

This s5 FFR Storage SCU Application Entity sends screen snapshot images to a remote storage server (Archive to Network) using the DICOM C-STORE SCU services. An association request is sent to the remote storage AE and upon successful negotiation of a Presentation Context the image transfer is started. If the association cannot be opened, an error is reported to the user and the transfer fails. The Storage AE will not try to initiate another association for this transfer automatically.

3.1.3 SEQUENCING OF REAL-WORLD ACTIVITIES

All real world activities that initiate communication to remote AE's operate synchronously with respect to each other and other s5 system operations.

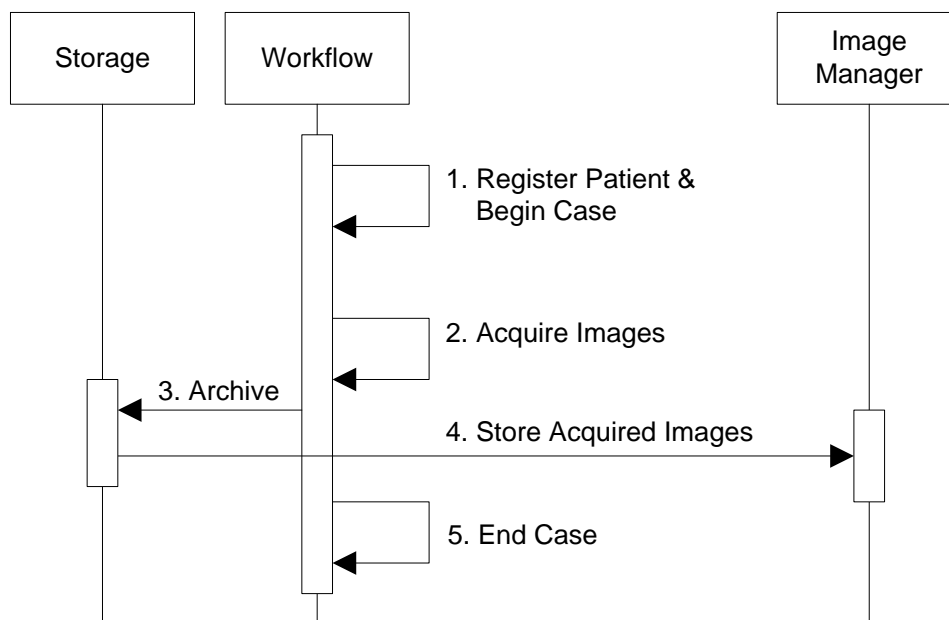


Figure 3-2 Sequencing Constraints

Under normal scheduled workflow conditions the sequencing constraints illustrated in Figure 3-2 Sequencing Constraints apply:

1. Register a patient and begin case.
2. Acquire 1 or more FFR images.
3. User selects the Archive to Network function
4. Store acquired images instances
5. End the Case

If the Image Manager is configured as an archive device the Storage AE will request Storage. Other workflow situations will have other sequencing constraints.

3.2 AE SPECIFICATIONS

3.2.1 STORAGE AE SPECIFICATION

The s5 FFR Storage AE provides conformance to the DICOM V3.0 SOP Classes listed in Table 3.2-1 as an SCU.


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Table 3.2-1 Storage AE SOP Class Support

SOP Class Name	SOP CLASS UID	CONFORMANCE LEVEL
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Standard

3.2.1.1 ASSOCIATION ESTABLISHMENT POLICIES

The Storage AE will initiate an association to a device in response to the following real-world activities; Archive to Network.

3.2.1.1.1 GENERAL

The Volcano s5 FFR system uses TCP/IP. The Maximum Length PDU negotiation is included in all association establishment requests. The maximum length PDU offered for an association initiated by the Volcano s5 FFR system is:

Maximum PDU size offered to SCP	65536 bytes
---------------------------------	-------------

The following DICOM Application Context Name UID is proposed and recognized:

DICOM Application context name:	1.2.840.10008.3.1.1.1
---------------------------------	-----------------------

3.2.1.1.2 NUMBER OF ASSOCIATIONS

Number of simultaneous associations:	1
--------------------------------------	---

3.2.1.1.3 ASYNCHRONOUS NATURE

The Storage AE will not use asynchronous operations.

3.2.1.1.4 IMPLEMENTATION IDENTIFYING INFORMATION

Implementation Class UID:	2.16.840.1.113977.6
Implementation Version name:	VOL_DISTA_2.6

Note: "113977" is registered by Volcano (previously registered by EndoSonics) with ANSI. Version name will be used initially as shown, but is subject to change with new versions of the DICOM capable application software.

3.2.1.2 ASSOCIATION INITIATION BY REAL-WORLD ACTIVITY

The Storage AE will open an association to the currently selected remote storage server device in response to the following real-world activities; Archive To Network, and Check Status.

3.2.1.2.1 ASSOCIATION INITIATION BY: ARCHIVE TO NETWORK

The Archive to Network real-world activity will cause the Storage AE to open an association with the current selected remote storage server. The current storage server is selected in the "Select Server" list located in the s5 IVUS DICOM/Network Configuration menu. In the s5 FFR Archive menu, the user can select the current active case for transfer to a single DICOM Storage destination. A single association is opened for entire Study/Series transferred. If the Study/Series contains multiple images then multiple C-STORE requests will be issued over the same Association.

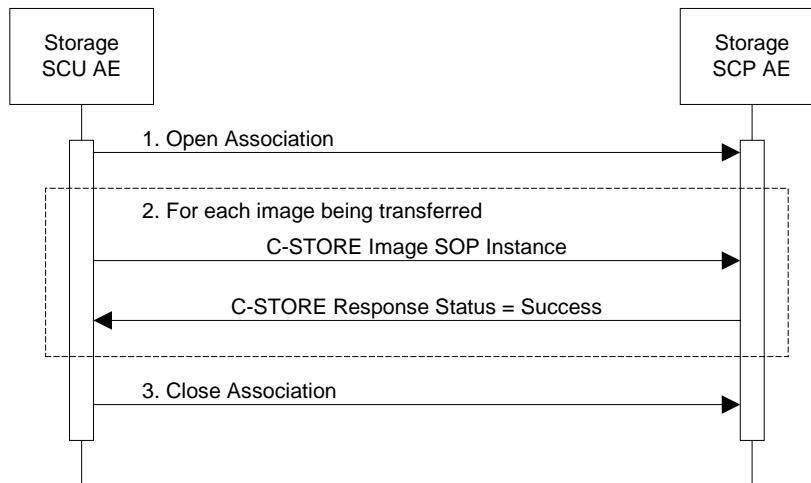


Figure 3-3 Sequencing of Activity - Archive to Network

A possible sequence of interactions between the s5 FFR Storage AE and a remote Storage AE (e.g. Image Manager) is illustrated in Figure 3-1:

1. The Storage AE opens an association with the Image Manager
2. Acquired images are transferred, one at a time, to the Image Manager using C-STORE requests. The Image Manager replies with a C-STORE response (Status Success) for each successful image transfer.
3. The Storage AE closes the association with the Image Manager.

3.2.1.3 PROPOSED PRESENTATION CONTEXTS TO AN STORAGE SERVER

Each time an association is initiated, the Association Initiator proposes a number of Presentation Contexts to be used on that association. Table 3.2-2 shows the Presentation Contexts proposed by the s5 FFR Storage AE during an Archive to Network operation.

Table 3.2-2 Storage AE Proposed Presentation Contexts to an Storage Server

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Little Endian JPEG Baseline (Process 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50	SCU	None

3.3 COMMUNICATION PROFILES


All Volcano s5 FFR 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.

3.3.1 TCP/IP STACK SUPPORTED

The TCP/IP protocol is used. The s5 FFR system does not support any services as an SCP. Local AE port number is therefore not required or used.

3.3.2 PHYSICAL NETWORK INTERFACE

Standard representations of IEEE 802.3 10BaseT/100BaseT (“twisted pair”) are supported.

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3.4 EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

3.4.1 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPs


None.

3.4.2 PRIVATE TRANSFER SYNTAXES

None

3.5 CONFIGURATION

All DICOM/Network configuration of the s5 FFR system is handled through the s5 IVUS application. See the s5 DICOM Conformance Statement for configuration details.

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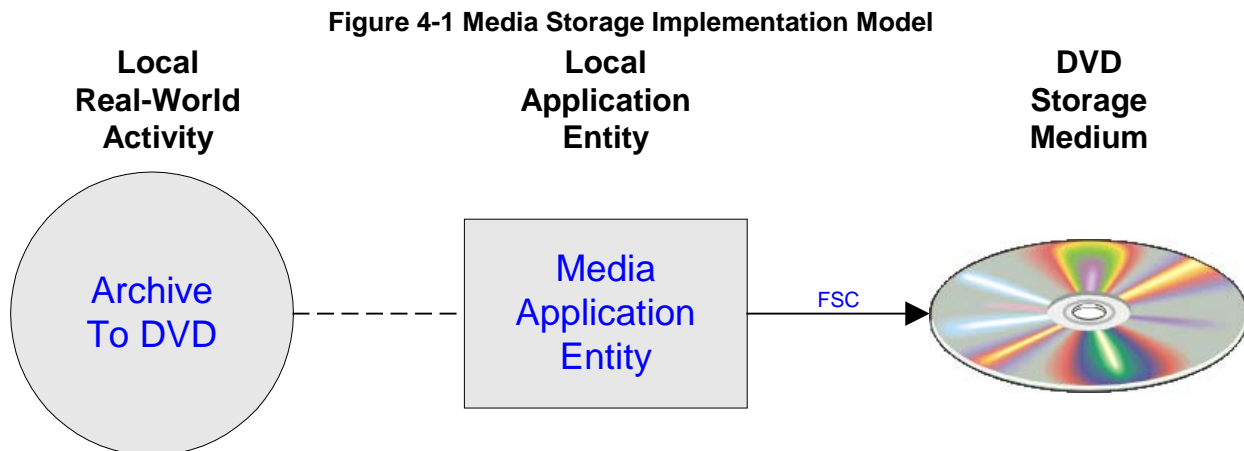
4 MEDIA INTERCHANGE

The Volcano s5 FFR system is a device that generates Hemodynamic waveform images that can be transferred to the CIS PACS and/or archived to CD-R or DVD-R media using DICOM standard protocols and definitions. The applications described refer to the s5 FFR DICOM off-line media storage implementation acting as FSC for the specific application profiles and the related SOP Class instances. The Volcano s5 FFR system acts as a File Set Reader for discs that were created on Volcano s5 FFR system.

4.1 IMPLEMENTATION MODEL

4.1.1 APPLICATION DATA FLOW DIAGRAM

The diagram in Figure 4-1 represents the relationship between the FFR system's real-world activities (circle on the left), the local AE's built into s5 FFR (box in the center), and the DICOM Exchange Media that the s5 FFR creates.



4.1.2 FUNCTIONAL DEFINITIONS OF AE'S

4.1.3 SEQUENCING OF REAL WORLD ACTIVITIES

Only the current active case may be archived to Exchange Media. The operator must have inserted a new (blank) CD/DVD media before invocation of the "Archive to CD/DVD" function. If no CD/DVD media is available, the inserted media is not CD-R/DVD-R, or the media is not blank, the export job will be canceled.


The Archive to CD/DVD Real-World Activity operates as a foreground task. No other s5 FFR system functions are available while the media is being created.

After the media has been created, a verification step may be performed to ensure that data was successfully written to the media.

4.1.4 IMPLEMENTATION CLASS AND VERSION

The s5 FFR implementation information written to the File Meta Header in each file is:

Implementation Class UID: 2.16.840.1.113977.6
 Implementation Version Name: VOL_DISTA_2.6

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4.2 AE SPECIFICATION

4.2.1 MEDIA AE SPECIFICATION

The s5 FFR Media Application Entity provides standard conformance to the DICOM Media Storage Service and File Format Class (PS 3.10) and the Media Storage Application Profile (PS 3.11).

The s5 FFR Media Application Entity supports the Application Profiles listed in Table 4-1

Table 4-1 Application Profiles, Activities, and Roles

Application Profile	Identifier	Real-World Activity	Role	SC Option
General Purpose CD	STD-GEN-CD	Archive to CD	FSC	N/A
General Purpose DVD	STD-GEN-DVD	Archive to DVD	FSC	N/A
	STD-GEN-DVD-JPEG			

The s5 FFR Media AE supports the IODs, SOP classes and Transfer Syntaxes listed in Table 4-2

Table 4-2 Supported IODS, SOP Classes and Transfer Syntaxes

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
DICOM Media Storage Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50

The s5 FFR DVD Media AE supports the Photometric Interpretations based on SOP classes and Transfer Syntaxes listed in Table 4-3.

Table 4-3 Supported Photometric Interpretations

Information Object Definition	SOP Class UID	Transfer Syntax	Photometric Interpretation
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	RGB
		JPEG Baseline (Process 1)	YBR_FULL_422

4.2.1.1 APPLICATION ENTITY TITLE


The Application Entity Title used is VOL_MEDIA_STORE

4.2.1.2 DICOM FILE META INFORMATION

Table 4-4 denotes the DICOM file meta attributes included in the DICOMDIR and Ultrasound Image objects (DICOM Part 10 files) that are created by the Volcano s5 FFR system. These attribute are stored in addition to the attributes listed in the SC Image Storage SOP instances.

Table 4-4 DICOM Part 10 File Meta Information

Attribute Name	Tag	Notes
File Preamble	N/A	All bytes are set to 00H
DICOM Prefix	N/A	Set to DICOM Prefix "DICM"

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Meta Element Group Length	(0002,0000)	
File Meta Information Version	(0002,0001)	Set to 0001H
Media Storage SOP Class UID	(0002,0002)	1.2.840.10008.5.1.4.1.1.3.1
Media Storage SOP Instance UID	(0002,0003)	s5 FFR generated UID
Transfer Syntax UID	(0002,0010)	Set to Explicit VR Little Endian 1.2.840.10008.1.2.1
Implementation Class UID	(0002,0012)	Set to "2.16.840.1.113977.6"
Implementation Version Name	(0002,0013)	Set to "VOL_DISTA_2.6"
Source Application Entity Title	(0002,0016)	Set to "VOL_MEDIA_STORE"



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4.2.1.3 DICOMDIR INFORMATION

Table 4-5 denotes the DICOM attributes included in the DICOMDIR file that is created by the Volcano s5 FFR system. These attribute are stored in addition to the meta attributes listed in 4.2.1.2 - DICOM File Meta Information.

Table 4-5 DICOMDIR Attributes

Attribute Name	Tag	Type	Notes
File Set ID	(0004,1130)	2	s5 FFR generated Volume label of media.
Offset Of The First Directory Record Of The Root Directory Entity	(0004,1200)	1	
Offset Of The Last Directory Record Of The Root Directory Entity	(0004,1202)	1	
File Set Consistency Flag	(0004,1212)	1	Set to 000H
Directory Record Sequence	(0004,1220)	2	
> Offset Of The Next Directory Record	(0004,1400)	1C	
> Record In Use Flag	(0004,1410)	1C	Set to FFFFH
> Offset Of Referenced Lower Level Directory Entity	(0004,1420)	1C	
> Directory Record Type	(0004,1430)	1C	Set to PATIENT, STUDY, SERIES or IMAGE
> Specific Character Set	(0008,0005)	1C	Set to "ISO_IR 100"
Patient Keys		Directory Record Type = PATIENT	
> Patient's Name	(0010,0010)	2	Entered in Patient dialog
> Patient ID	(0010,0020)	1	Entered in Patient dialog
> Patient's Birth Date	(0010,0030)	3	Entered in Patient dialog
> Patients Sex	(0010,0040)	3	Entered in Patient dialog
Study Keys		Directory Record Type = STUDY	
> Study Date	(0008,0020)	1	Date the FFR procedure began.
> Study Time	(0008,0030)	1	Time the FFR procedure began.
> Accession Number	(0008,0050)	2	Entered in Patient dialog from IVUS
> Study Description	(0008,1030)	2	Entered in Patient dialog from IVUS
> Study Instance UID	(0020,000d)	1C	Internally generated.
> Study ID	(0020,0010)	1	Entered in Patient dialog from IVUS
Series Keys		Directory Record Type = SERIES	
> Modality	(0008,0060)	1	Set to HD.
> Series Date	(0008,0021)	3	Date the FFR series was created
> Series Time	(0008,0031)	3	Time the FFR series was created
> Institution Name	(0008,0080)	3	Hospital name
> Series Description	(0008,103e)	3	Set to "FFR"
> Performing Physicians' Name	(0008,1050)	3	Name of physician performing the procedure
> Series Instance UID	(0020,000e)	1	s5 FFR generated UID
> Series Number	(0020,0011)	1	Set to 1
Image Keys		Directory Record Type = IMAGE	
> Referenced File ID	(0004,1500)	1C	Set to "CASEnnnn\FILEnnnn"
> Referenced SOP Class UID In File	(0004,1510)	1C	Set to 1.2.840.10008.5.1.4.1.1.7
> Referenced SOP Instance UID In File	(0004,1511)	1C	
> Referenced Transfer Syntax UID In File	(0004,1512)	1C	Little Endian Explicit or JPEG Baseline (Process 1) if compression is selected.

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> Image Type	(0008,0008)	3	ORIGINAL\PRIMARY
> Content Date	(0008,0023)	3	Image creation date.
> Content Time	(0008,0033)	3	Image creation time.
> Instance Number	(0020,0013)	1	Image number from 1-n in order of acquisition
> Image Comments	(0020,4000)	3	
> Samples per Pixel	(0028,0002)	3	Set to 3
> Rows	(0028,0010)	3	1024
> Columns	(0028,0011)	3	1280

4.2.1.4 REAL WORLD ACTIVITIES

4.2.1.4.1 ARCHIVE TO CD/DVD

Archive to CD/DVD real-world activity occurs for the currently active case in the s5 FFR system when the user initiates the Archive to CD/DVD function. Only the current active case may be archived to a single CD/DVD media at one time. The s5 FFR Media AE will act as a FSC using the Interchange option when storing images and data to CD/DVD media.

4.2.1.5 APPLICATION PROFILE SPECIFIC CONFORMANCE

There are no extensions or specializations.


4.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

4.3.1 AUGMENTED APPLICATION PROFILES

none

4.3.2 PRIVATE APPLICATION PROFILES

none

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4.4 MEDIA CONFIGURATION

Compression type for DICOM Image storage to network or exchange media can be configured through the DICOM Configuration menu.

- Compression Type – See Table 4-6 Compression Settings for the available selections and additional information.

Table 4-6 Compression Settings

Compression Setting	Photometric Interpretation	Transfer Syntax	Compression Ratio (approx)
No Compression	RGB	Explicit Little Endian	N/A
JPEG High Quality	YBR_FULL_422	JPEG Baseline (Process 1)	~9:1

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5 SOP CLASSES

5.1 SECONDARY CAPTURE IMAGE IOD

The s5 FFR system utilizes the Secondary Capture Image Storage as the primary SOP Class for network storage and archiving to exchange media.

Table 5-SC Image IOD Modules

IE	Module	Reference	Usage
Patient	Patient	Table 5-1	M
	Clinical Trial Subject	N/A	Not Used
Study	General Study	Table 5-2	M
	Patient Study	Table 5-3	U
	Clinical Trial Study	N/A	Not Used
Series	General Series	Table 5-4	M
	Clinical Trial Series	N/A	Not Used
Equipment	General Equipment	Table 5-5	U
	SC Equipment	Table 5-6	M
Image	General Image	Table 5-7	M
	Image Pixel	Table 5-8	M
	Device	Table 5-9	U
	SC Image	Table 5-10	M
	Overlay Plane	N/A	Not Used
	Modality LUT	N/A	Not Used
	VOI LUT	N/A	Not Used
	SOP Common	Table 5-11	M

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5.2 MODULE DEFINITIONS

This section defines the DICOM Modules used by the Volcano s5 FFR system. Attributes that are not listed in the module are not used:

Table 5-1 Patient Module Attributes

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	Patient's full name. ¹
Patient ID	(0010,0020)	2	Primary hospital identification number or code for the patient. ¹
Patient's Birth Date	(0010,0030)	2	Birth date of the patient. ¹
Patient's Sex	(0010,0040)	2	Sex of the named patient. ¹ Enumerated Values: M = male F = female Empty = default

Table 5-2 General Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	Unique identifier for the Study. ²
Study Date	(0008,0020)	2	Date the Study started.
Study Time	(0008,0030)	2	Time the Study started.
Referring Physician's Name	(0008,0090)	2	Name of the patient's referring physician. ³
Study ID	(0020,0010)	2	User or equipment generated Study identifier. ³
Accession Number	(0008,0050)	2	A RIS generated number that identifies the order for the Study. ³
Study Description	(0008,1030)	3	Institution-generated description or classification of the Study (component) performed. ³

Table 5-3 Patient Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Patient's Size	(0010,1020)	3	Length or size of the Patient, in meters. ³
Patient's Weight	(0010,1030)	3	Weight of the Patient, in kilograms. ³
Additional Patient's History	(0010,21B0)	3	Entered in s5 IVUS Patient dialog - History Checklist

¹ Comes from s5 IVUS DICOM Worklist when available. Otherwise entered by user. Values coming from s5 IVUS DICOM Worklist may not be modified by the user.

² Comes from s5 IVUS DICOM Worklist when available. Otherwise generated by the s5 FFR system.

³ Comes from s5 IVUS DICOM Worklist when available. Otherwise set to zero length or not sent.


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Table 5-4 General Series Module Attributes

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Set to HD.
Series Instance UID	(0020,000E)	1	Unique identifier of the Series.
Series Number	(0020,0011)	2	Set to 1
Series Date	(0008,0021)	3	Date the FFR Series was created.
Series Time	(0008,0031)	3	Time the FFR Series created.
Performing Physicians' Name	(0008,1050)	3	Name of the physician(s) performing the procedure. ²
Series Description	(0008,103E)	3	Set to "Intravascular FFR"
Operators' Name	(0008,1070)	3	Login name of the operator using the FFR system.

Table 5-5 General Equipment Module Attributes


Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	Set to "Volcano Corporation"
Institution Name	(0008,0080)	3	Set to the Hospital's name
Station Name	(0008,1010)	3	Set to the system hostname
Manufacturer's Model Name	(0008,1090)	3	Set to "s5 FFR"
Device Serial Number	(0018,1000)	3	Volcano serial number of the equipment that produced the composite instances.
Software Versions	(0018,1020)	3	Volcano designation of software version of the equipment that produced the composite instances.

Table 5-6 SC Equipment Module Attributes

Attribute Name	Tag	Type	Attribute Description
Conversion Type	(0008,0064)	1	Set to DI = Digital Interface

Table 5-7 General Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	Set from 1...n images in series, in order of acquisition.
Content Date	(0008,0023)	2C	The date the image pixel data creation started.
Content Time	(0008,0033)	2C	The time the image pixel data creation started.
Image Type	(0008,0008)	3	Set to ORIGINAL/PRIMARY
Acquisition DateTime	(0008,002A)	3	The date and time that the acquisition of data that resulted in this image started.

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			(FUTURE)
Derivation Description	(0008,2111)	3	Set to "JPEG Lossy". Only included if JPEG Lossy Compression is used
Image Comments	(0020,4000)	3	User-defined comments about the image
Lossy Image Compression	(0028,2110)	3	Set to 01. Only included if JPEG Lossy Compression has been applied to the image.
Lossy Image Compression Ratio	(0028,2112)	3	Only included if JPEG Lossy Compression has been applied to the image.
Lossy Image Compression Method	(0028,2114)	3	Set to ISO_10918_1. Only included if JPEG Lossy Compression has been applied to the image.

Table 5-8 Image Pixel Module Attributes

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	Set to 3.
Photometric Interpretation	(0028,0004)	1	See section 5.2.1.1.1
Rows	(0028,0010)	1	1024
Columns	(0028,0011)	1	1280
Bits Allocated	(0028,0100)	1	Set to 8
Bits Stored	(0028,0101)	1	Set to 8
High Bit	(0028,0102)	1	Set to 7
Pixel Representation	(0028,0103)	1	0000H = unsigned integer.
Pixel Data	(7FE0,0010)	1C	
Planar Configuration	(0028,0006)	1C	0 = color-by-pixel.

5.2.1.1.1 PHOTOMETRIC INTERPRETATION ATTRIBUTE

Photometric Interpretation is set to either RGB or YBR_FULL_422 based on transfer syntax used. See Table 4-3 Supported Photometric Interpretations.

Table 5-9 Device Module Attributes

Attribute Name	Tag	Type	Attribute Description
Device Sequence	(0050,0010)	3	Sequence of items describing devices.
>Code Value	(0008,0100)	1	R-00311
>Coding Scheme Designator	(0008,0102)	1	SRT
>Code Meaning	(0008,0104)	1	Intracoronary pressure guide wire
>Manufacturer	(0008,0070)	3	Set to "Volcano Corporation"
>Device Diameter	(0050,0016)	3	Set to ".014" inches.
>Device Diameter Units	(0050,0017)	2C	IN = Inch
>Device Description	(0050,0020)	3	Set to "FFR pressure wire"



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Table 5-10 SC Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
Date of Secondary Capture	(0018,1012)	3	The date the Secondary Capture Image was captured.
Time of Secondary Capture	(0018,1014)	3	The time the Secondary Capture Image was captured.

Table 5-11 SOP Common Module Attributes

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	Set to 1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	1	Uniquely identifies the SOP Instance.
Specific Character Set	(0008,0005)	1C	Set to ISO_IR 100

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6 SUPPORT OF EXTENDED CHARACTER SETS

The Volcano s5 FFR system supports the ISO 8859 Latin 1 (ISO-IR 100) character set family.