

SwissVision TR4000

DICOM Conformance Statement
Print Services

Program Version 9.3 or later
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Document Revision History

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0 Introduction

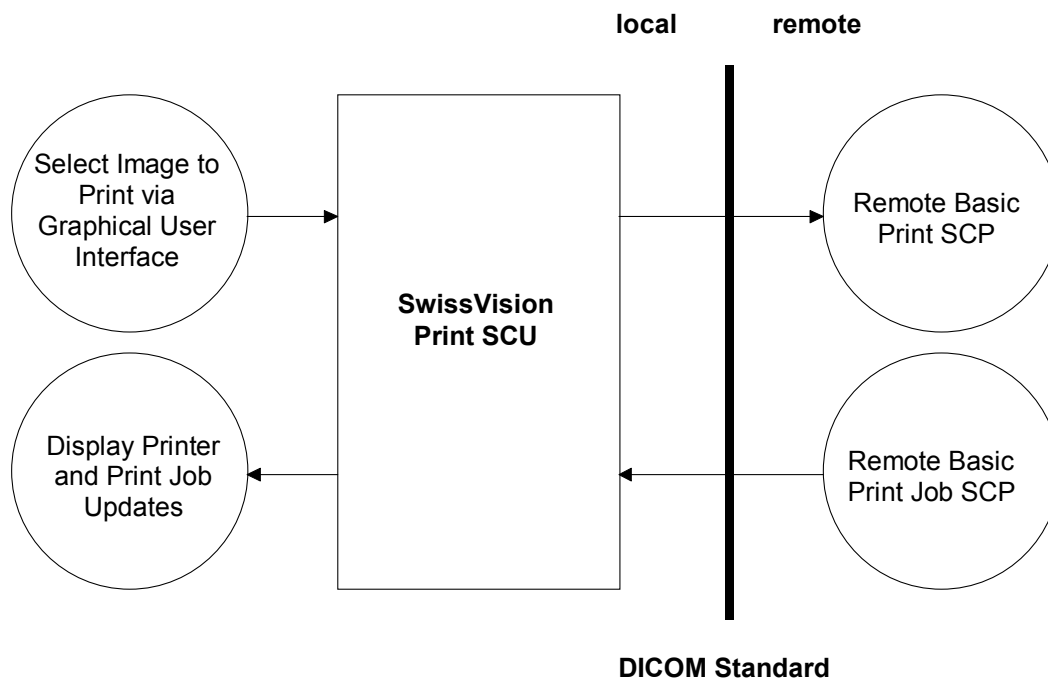
This is the conformance statement for the SwissVision "Print" application which supports DICOM 3.0 Print Services as a Service Class User (SCU). This conformance statement is valid for the SwissVision V 9.3 and higher.

1 Implementation Model

The SwissVision "Print" application is an implementation of a DICOM Basic Print User (SCU) which can send DICOM images to a DICOM Basic Print Provider (SCP). It is realized using the MergeCOM-3 Advanced Integrator's Tool Kit from Merge Technologies Inc.

1.1 Application Data Flow Diagram

Figure 1: SwissVision "Print" application data flow diagram:



1.2 Functional Definition of Application Entity (AE)

The SwissVision "Print" application allows to send DICOM CR and DX images to a DICOM printer. It allows the user to select the images to be printed, the print format and layout and the print provider with the graphical user interface.

The application establishes an association with the selected print provider just prior to sending a print request to that AE. Afterwards it can receive printer and print job updates at any time.

All communication and image with the remote application is accomplished utilizing the DICOM protocol over a network using the TCP/IP protocol stack.

1.3 Sequencing of real-world Activities

Not applicable.

2 AE Specifications

2.1 SwissVision “Print”

The SwissVision “Print” application provides standard conformance to the DICOM Basic Grayscale Print Management Meta SOP class and Print Job SOP class as a DICOM Basic Print User (SCU).

Table 1: Valid SOP Classes for the SwissVision “Print” application

SOP Class Name	SOP Class UID
Basic Grayscale Print Management (META)	1.2.840.10008.5.1.1.9
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16
Print Job	1.2.840.10008.5.1.1.14

2.1.1 Association Establishment Policies

2.1.1.1 General

The SwissVision “Print” application initiates an association as an SCU of Print Services when the local operator requests to print images over the network to a remote DICOM Print provider. The maximum PDU size is 28’672 bytes.

2.1.1.2 Number of Associations

The SwissVision “Print” application only opens one association at a time. There is one film with one to four images printed per association.

2.1.1.3 Asynchronous Nature

The SwissVision “Print” application does not support asynchronous communication (multiple outstanding transactions over a single association).

2.1.1.4 Implementation identifying Information

The implementation class unique identifier (UID) for the SwissVision “Print” application is:

2.16.840.1.113929.1.9.980811

The Implementation version name for the SwissVision “Print” application is:

SwissVision_1.0

2.1.2 Association Initiation by real-world Activity

The SwissVision “Print” application initiates an association for the appropriate Print Service Class that corresponds to the image to be printed. The association is normally closed when the image has been printed and the print job has completed. Optionally, if the user does not want to monitor the print job, the association is closed directly after sending the image to the SCP. The association is aborted when an error or timeout occurs.

2.1.2.1 Real-world Activity for Print Image Operations

The SwissVision “Print” application initiates associations for the printing of images to a Basic Print SCP.

2.1.2.1.1 Associated real-world Activity for Print Image Operations

Once the Print Image association has been established, the SwissVision “Print” application sends a Basic Film Session N-CREATE message to the Basic Print SCP. This is followed by a Basic Film Box N-CREATE message. The SwissVision “Print” application then sends one to four Basic Grayscale Image Box N-SET messages. Finally, a N-ACTION message is sent to instruct the Basic Print SCP to print at the Basic Film Box level.

2.1.2.1.2 Proposed Presentation Contexts for Print Image Operations

The presentation contexts that are proposed by the SwissVision "Print" application for the Print Image operation are specified in Table 2. All these SOP classes conform to the standard Print Services as specified in the DICOM Standard.

Table 2: Print Image Presentation Contexts of the SwissVision "Print" application

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management (META)	1.2.840.10008.5.1.1.9	DICOM Implicit VT Little Endian DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none
Print Job	1.2.840.10008.5.1.1.14	DICOM Implicit VT Little Endian DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.1.2.1.3 SOP Specific Conformance

Attribute values for SOP classes proposed by the SwissVision "Print" application are specified in Table 3.

Table 3: Attribute values for supported SOP Classes

SOP Class Name	Command	Attribute Name	Valid Range	Default Value
Basic Film Session	N-CREATE	Number of Copies	1-99	1
		Print Priority	LOW, MEDIUM, HIGH	LOW
		Medium Type	BLUE FILM, CLEAR FILM, PAPER	0
		Film Destination	not used	-
		Film Session Label	not used	-
		Memory Allocation	not used	-

SOP Class Name	Command	Attribute Name	Valid Range	Default Value
Basic Film Box	N-CREATE	Image Display Format	STANDARD\1,1, STANDARD\2,1, STANDARD\1,2, STANDARD\2,2	STANDARD \1,1
		Film Orientation	not used or PORTRAIT LANDSCAPE	not used
		Film Size ID	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM	-

SOP Class Name	Command	Attribute Name	Valid Range	Default Value
		Magnification Type	NONE, REPLICATE, BILINEAR, CUBIC	NONE
		Max Density	not used	-
		Configuration Information	not used	-
		Smoothing Type	not used	-
		Border Density	not used	-
		Empty Image Density	not used	-
		Min Density	not used	-
		Trim	not used	-
Basic Film Box	N-ACTION	Ref. Print Job Seq.		
Basic Grayscale Image Box	N-SET	Image Position	1 - 4	1
		Samples per Pixel	1	1
		Photometric Interpr.	MONOCHROME2	MONOCHR.2
		Rows	any integer	all rows
		Columns	any integer	all columns
		Pixel Aspect Ratio	1/1	1/1
		Bits Allocated	8 or 16	16
		Bits Stored	8 or 12	12
		High Bit	7 or 11	11
		Pixel Representation	0000	0
		Polarity	not used	-
		Magnification Type	not used	-
		Smoothing Type	not used	-
		Requested Image Size	optional *)	-

*) Requested Image Size is supplied if "Print with Original Size" is selected.

SOP Class Name	Command	Attribute Name	Valid Range	Default Value
Printer	N-GET/ N-EVENT-REPORT	Printer Status	displayed	-
		Printer Status Info	displayed	-
		Printer Name	displayed	-
		Manufacturer	displayed	-
		Model Name	displayed	-
		Software Version	ignored	-
Print Job	N-EVENT-REPORT	Execution Status	displayed	-

SOP Class Name	Command	Attribute Name	Valid Range	Default Value
		Execution Status Info	displayed	-
		Print Priority	ignored	-
		Creation Date + Time	ignored	-
		Printer Name	ignored	-
		Originator	ignored	-

3 Communication Profiles

The SwissVision "Print" application provides TCP/IP network communication support as defined by PS 3.8, on any physical medium supporting the TCP/IP (e.g. Ethernet, etc.).

4 Extension / Specialization / Privatization

4.1 Standard extended /specialized / private SOP's

None supported.

4.2 Private Transfer Syntax

None supported.

5 Configuration

5.1 Local Settings

The Local Application Title and the Response Timeout can be entered during setup using the graphical user interface. Default values are "SVISION_PR" for the AE title and 30 seconds for the response timeout.

Optional composition of all images into one image box can be selected during setup if the printer does not support printing of multiple images with different sizes on one film.

Optional addition of black borders to original size images can be selected during setup if the printer does not support addition of black borders to original size images smaller than the film size.

Anonymous Print

With the checkmark "Use Only Initials" only the patient's initial will be sent to the printer.

5.2 Host Properties

The Remote Application Title, Host Name and Remote Port Number of one or more print providers can be entered during setup using the graphical user interface.

5.3 Printer Properties

The allocated bits/pixel (8 or 16) required by the printer and the film size, supported formats, printable box size and resolution of the printer can be entered during setup using the graphical user interface.

Printable box size and resolution will be used to crop the image if the requested image size exceeds the printer limits for original size printing.

The optimal setting for the resolution for 16 bit images is 8 Bit.

6 Support of Extended Character Sets

The SwissVision "Print" application supports the following character sets:

- ISO_IR_100 Latin 1
- ISO_IR_101 Latin 2 / Eastern Europe
- ISO_IR_109 Latin 3 / Turkish
- ISO_IR_110 Latin 4 / Baltic
- ISO_IR_126 Greek
- ISO_IR_127 Arabic
- ISO_IR_138 Hebrew
- ISO_IR_144 Cyrillic