

Visage[®] 7

HL7 Interface Specification

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2. Introduction

2.1 Revision History

Document Version	Date	Description
01.00	2006-02-28	Release Version for Visage PACS 4.0
02.00	2006-06-22	Release Version for Visage PACS/CS 4.1
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09.00	2008-06-30	Release Version for Visage PACS/CS 6.0, 1 st version
10.00	2008-07-02	Release Version for Visage PACS/CS 6.0, 2 nd version
11.00	2009-08-28	Release Version for Visage PACS/CS 6.0, 3 rd version
12.00	2009-12-09	Release Version for Visage 7

2.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of HL7.

2.3 Remarks

This document is the HL7 Interface Specification for Visage 7.

HL7, by itself, does not guarantee interoperability. However, the Interface Specification facilitates a first-level validation for interoperability between different applications supporting the same HL7 functionality.

This Interface Specification is not intended to replace validation with other HL7 equipment to ensure proper exchange of information intended.

The scope of this Interface Specification is to facilitate communication between Visage 7 and other HL7 systems. The Interface Specification should be read and understood in conjunction with the HL7 Standard and the IHE Technical Framework Revision 7.0. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different Interface Specifications is the first step towards assessing interconnectivity between Visage 7 and other HL7 conformant equipment.
- Test procedures should be defined to validate the desired level of connectivity.

2.4 Abbreviations and Acronyms

ACK	Acknowledge
ADT	Admission, Discharge and Transfer
CS	Client/Server
DICOM	Digital Imaging and Communications in Medicine
DSS	Department System Scheduler
HL7	Health Level 7
IHE	Integrating the Healthcare Enterprise
IP	Internet Protocol
MLLP	Minimal Lower Layer Protocol
MSA	Message Acknowledgement (Segment)
MRG	Merge Patient Information (Segment)
MSH	Message Header (Segment)
LLP	Lower Layer Protocol
ORM	General Order Message
PACS	Picture Archiving and Communication System
PID	Patient Identification (Segment)
PIR	Patient Information Reconciliation
PV1	Patient Visit (Segment)
RIS	Radiology Information System
TCP	Transmission Control Protocol
UID	Unique Identifier
UTF	Unicode Transformation Format
VR	Value Representation

3. Functional Overview

3.1 General

The Visage 7 concept is based on a modular architecture for distributing medical images and reports within and outside of a clinical area. It allows external systems to send DICOM objects to it for temporary storage and long-term archiving.

This requires to provide mechanisms for patient information reconciliation. Therefore Visage 7 implements a HL7 Interface which supports a subset of HL7 messages defined by the IHE transaction 'Patient Update'.

The functionality which is provided with the HL7 module is:

- Reception of incoming HL7 trigger event messages.
- Converting information received with the HL7 messages into DICOM conform data sets.
- Performing patient information reconciliation processes by modifying DICOM objects stored within Visage 7 according to the HL7 requests.
- Sending appropriate response messages to the sender of the request message.

Additionally, Visage 7 implements functionality for quality assurance of incoming DICOM images: the data contained in images can be matched against HL7 messages defined by the IHE transaction 'Procedure Scheduled' / 'Procedure Updated'. In case differences are identified, those can be automatically corrected in the images, or they can be manually checked using the Quality Assistance function in the Visage Client.

The functionality which is provided by the HL7 module for this is:

- Reception of incoming HL7 order event messages.
- Converting these message and storing them locally in a data base.
- Sending appropriate response messages to the sender of the request message.
- Match procedures against images and perform the required updates in the images, if configured.

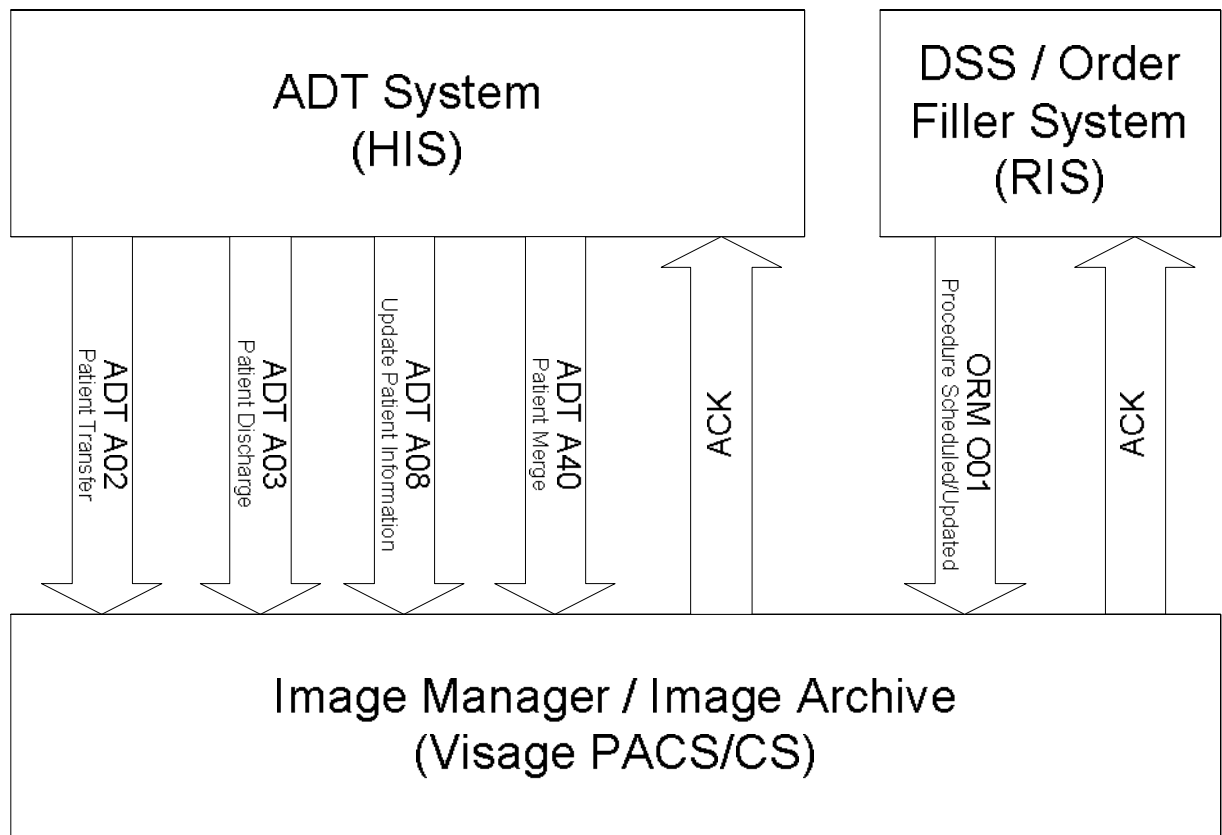
Additionally, the HL7 can report to the sender about unsupported messages (unsupported message types or HL7 versions)

3.2 Framework

The HL7 communication takes place between the ADT actor and Visage 7 which works as the Images Manager / Image Archive actor according to the IHE Standard. Actors are communication systems or components of information systems that produce, manage or act on information associated with operational activities in the enterprise. In the following the actors are described that are affected by the Visage 7 HL7 communication:

- ADT System:
A system responsible for adding and/or updating patient demographic and encounter information.
- Department System Scheduler / Order Filler:
A system that provides functions related to the management of orders received from external systems or through the departments system's user interface.
- Image Manager:
A system that provides functions related to safe storage and management of evidence objects.
- Image Archive:
A system that provides long term storage of evidence objects.

In the following diagram the data flow between the actors ADT and DSS / Order Filler and the Image Manager / Image Archive that is represented by Visage 7 is illustrated.



4. Communication Interface

The HL7 Standard recommends the Minimal Lower Layer Protocol (MLLP) for the communication between HL7 systems. For this purpose the HL7 Interface of Visage 7 provides a unidirectional TCP/IP socket interface. The Lower Layer Protocol defined by the HL7 Standard is implemented as follows:

- Message Start Character: 0x0B
- Segment End Character: 0x0D
- Message Stop Characters: 0x1C and 0x0D
- Character Encoding: UTF-8

Visage 7 allows to configure the character encoding of HL7 messages to UTF-8, ansi (code page 1252), Mac (code page 10000), and default (standard Microsoft Windows[®] encoding). The other parameters are not configurable within the Visage 7 implementation. The number of concurrent connections which can be handled by Visage 7 is not limited.

5. Message Description

5.1 Overview

Visage 7 is able to handle a subset of ADT messages which are used to transmit portions of the Patient Administration data from one system to another. Additionally received ORM messages are accepted and responded to satisfy the requirements of the IHE Scheduled Workflow Profile.

This chapter informs about the supported HL7 versions and message types and describes the expected message contents and in which way the received data is used for further processing.

5.1.1 Supported IHE Profile

The Visage 7 HL7 interface supports a subset of HL7 messages defined by following IHE profiles and transactions:

- **Scheduled Workflow (SWF)**
Procedure Scheduled
Procedure Updated
- **Patient Information Reconciliation (PIR)**
Patient Update

5.1.2 Supported HL7 Versions

The Visage 7 HL7 interface supports messages which conform to the subset of HL7 versions which is listed below. Visage 7 responds to received messages of a not supported version with an Application Reject Acknowledgement message (see 5.4).

- HL7 Version 2.3
- HL7 Version 2.3.1
- HL7 Version 2.4
- HL7 Version 2.5

5.1.3 Supported Message Types

The Visage 7 HL7 interface supports the reception of the subset of ADT and ORM message types which is listed below. Visage 7 responds to received messages of a not supported type with an Application Reject Acknowledgement message (see 5.4).

- ADT A02 (Transfer a Patient)
- ADT A03 (Discharge/End Visit)
- ADT A08 (Update Patient Information)
- ADT A40 (Merge Patient – Patient Identifier List)
- ORM O01 (Procedure Scheduled/Updated)

5.2 ADT Messages

5.2.1 ADT A02 - Patient Transfer

This message type is used to update the location of a specific patient.

5.2.1.1 Message Specification

The patient visit update request and acknowledgement is specified by following trigger event and message types:

Trigger Event:	A02
Type of Request Message:	ADT A02
Type of Acknowledge Message:	ACK

5.2.1.2 Segment Description

The message segments and elements in the following tables are necessary to perform the patient visit update process and to generate an appropriate acknowledge message. The last column of the tables specifies the expected values and their intended use.

MSH Segment

Item	Element Name	Data Type	Value
0001	Field Separator	ST	For this element ' ' is expected.
0002	Encoding Characters	ST	For this element '^~&' is expected.
0009	Message Type	CM	For this element 'ADT^A02' is expected.
0010	Message Control ID	ST	Used to fill the acknowledge message.
0011	Processing ID	PT	Used to fill the acknowledge message.
0012	Version ID	VIT	Used for HL7 version check and to fill the acknowledge message.

PID Segment

Item	Element Name	Data Type	Value
00106	Patient Identifier List	CX	Used to identify the patient for the update process. <u>Note:</u> If this field contains more than one identifier only the first one is used for patient

			identification.
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PV1 Segment

Item	Element Name	Data Type	Value
00133	Assigned Patient Location	PL	New assigned location for the specified patient.

Constraints:

- A PIR process can only be performed for patients with a valid Patient ID.
- PIR requests for patients which are not available in Visage PACS/CS are ignored
- Visage 7 cannot perform a PIR process if it results in two or more identical patients.
- For PIR jobs no retry and visualization mechanisms are provided.
- When a PIR process is performed HTML reports stored in Visage 7 are either deleted or a warning text is added to the document depending on the configuration settings.

5.2.1.3 Attribute Processing

The reception of an ADT A02 message results in a PIR process in order to update patient visit information. Therefore it is necessary to convert the HL7 elements contained in the request message into appropriate DICOM attributes. This mapping process is described in chapter 5.5.1.

5.2.1.4 Acknowledgement

Visage 7 sends the acknowledge message after the PIR job was initiated or it is certain that PIR processing could not be performed successfully. In case of an unrecognized patient specified by the 'Patient Identifier List' item Visage 7 ignores the request and responds with status 'Success'. See chapter 5.4 for a detailed acknowledge message description.

5.2.2 ADT A03 - Patient Discharge

This message type is used to signal the end of a patient's stay in a healthcare facility by updating the location of a specific patient.

5.2.2.1 Message Specification

The patient visit update request and acknowledgement is specified by following trigger event and message types:

Trigger Event:	A03
Type of Request Message:	ADT A03
Type of Acknowledge Message:	ACK

5.2.2.2 Segment Description

The message segments and elements in the following tables are necessary to perform the patient visit update process and to generate an appropriate acknowledge message. The last column of the tables specifies the expected values and their intended use.

MSH Segment

Item	Element Name	Data Type	Value
0001	Field Separator	ST	For this element ' ' is expected.
0002	Encoding Characters	ST	For this element '^~&' is expected.
0009	Message Type	CM	For this element 'ADT^A03' is expected.
0010	Message Control ID	ST	Used to fill the acknowledge message.
0011	Processing ID	PT	Used to fill the acknowledge message.
0012	Version ID	VIT	Used for HL7 version check and to fill the acknowledge message.

PID Segment

Item	Element Name	Data Type	Value
00106	Patient Identifier List	CX	Used to identify the patient for the update process. <u>Note:</u> If this field contains more than one identifier only the first one is used for patient identification.

PV1 Segment

Item	Element Name	Data Type	Value
00133	Assigned Patient Location	PL	New assigned location for the specified patient.

Constraints:

- A PIR process can only be performed for patients with a valid Patient ID.
- PIR requests for patients which are not available in Visage PACS/CS are ignored
- For PIR jobs no retry and visualization mechanisms are provided.
- When a PIR process is performed HTML reports stored in Visage 7 are either deleted or a warning text is added to the document depending on the configuration settings.

5.2.2.3 Attribute Processing

The reception of an ADT A03 message results in a PIR process in order to update patient visit information. Therefore it is necessary to convert the HL7 elements contained in the request message into appropriate DICOM attributes. This mapping process is described in chapter 5.5.1.

5.2.2.4 Acknowledgement

Visage 7 sends the acknowledge message after the PIR job was initiated or it is certain that PIR processing could not be performed successfully. In case of an unrecognized patient specified by the 'Patient Identifier List' item Visage 7 ignores the request and responds with status 'Success'. See chapter 5.4 for a detailed acknowledge message description.

5.2.3 ADT A08 - Update Patient Information

This message type is used to merge to update demographic and visit information of a specific patient.

5.2.3.1 Message Specification

The patient merge request and acknowledgement is specified by following trigger event and message types:

Trigger Event:	A08
Type of Request Message:	ADT A08
Type of Acknowledge Message:	ACK

5.2.3.2 Segment Description

The message segments and elements in the following tables are necessary to perform the patient update process and to generate an appropriate acknowledge message. The last column of the tables specifies the expected values and their intended use.

MSH Segment

Item	Element Name	Data Type	Value
0001	Field Separator	ST	For this element ' ' is expected.
0002	Encoding Characters	ST	For this element '^~&' is expected.
0009	Message Type	CM	For this element 'ADT^A08' is expected.
0010	Message Control ID	ST	Used to fill the acknowledge message.
0011	Processing ID	PT	Used to fill the acknowledge message.
0012	Version ID	VIT	Used for HL7 version check and to fill the acknowledge message.

PID Segment

Item	Element Name	Data Type	Value
00106	Patient Identifier List	CX	Used to identify the patient for the update process. <u>Note:</u> If this field contains more than one identifier only the first one is used for patient identification.
00108	Patient Name	XPN	New name for the specified patient. <u>Note:</u>

			If this field contains more than one name only the first one is used for the update process.
00110	Date/Time Of Birth	TS	New date/time of birth for the specified patient.
00111	Sex	IS	New sex for the specified patient.

PV1 Segment

Item	Element Name	Data Type	Value
00133	Assigned Patient Location	PL	New assigned location for the specified patient.

Note:

According to the IHE Standard patient location changes should be requested with an ADT A02 message (Patient Transfer). However Visage 7 provides the possibility to perform modifications of the patient location when a Patient Information Update is requested with an ADT A08 message.

Constraints:

- A PIR process can only be performed for patients with a valid Patient ID.
- PIR requests for patients which are not available in Visage PACS/CS are ignored.
- A PIR process cannot be performed if it affects two or more patients with identical Patient IDs.
- Visage 7 cannot perform a PIR process if it results in two or more identical patients.
- For PIR jobs no retry and visualization mechanisms are provided.
- When a PIR process is performed HTML reports stored in Visage 7 are either deleted or a warning text is added to the document depending on the configuration settings.

5.2.3.3 Attribute Processing

The reception of an ADT A08 message results in a PIR process in order to update patient information. Therefore it is necessary to convert the HL7 elements contained in the request message into appropriate DICOM attributes. This mapping process is described in chapter 5.5.1.

5.2.3.4 Acknowledgement

Visage 7 sends the acknowledge message after the PIR job was initiated or it is certain that PIR processing could not be performed successfully. In case of an unrecognized patient specified by the 'Patient Identifier List' item Visage 7 ignores the request and responds with status 'Success'. See chapter 5.4 for a detailed acknowledge message description.

5.2.4 ADT A40 - Merge Patient (Patient Identifier List)

This message type is used to merge two patients identified by the Patient ID or to modify the Patient ID value of a specific patient.

5.2.4.1 Message Specification

The patient merge request and acknowledgement is specified by following trigger event and message types:

Trigger Event:	A40
Type of Request Message:	ADT A40
Type of Acknowledge Message:	ACK

5.2.4.2 Segment Description

The message segments and elements in the following tables are necessary to perform the patient merge process and to generate an appropriate acknowledge message. The last column of the tables specifies the expected values and their intended use.

MSH Segment

Item	Element Name	Data Type	Value
0001	Field Separator	ST	For this element ' ' is expected.
0002	Encoding Characters	ST	For this element '^~\&' is expected.
0009	Message Type	CM	For this element 'ADT^A40' is expected.
0010	Message Control ID	ST	Used to fill the acknowledge message.
0011	Processing ID	PT	Used to fill the acknowledge message.
0012	Version ID	VIT	Used for HL7 version check and to fill the acknowledge message.

PID Segment

Item	Element Name	Data Type	Value
00106	Patient Identifier List	CX	Used to identify the resulting patient of the merge process.

MRG Segment

Item	Element Name	Data Type	Value
00211	Prior Patient Identifier List	CX	Used to identify the patient to be merged into the resulting patient.

Notes:

- Visage 7 can handle more than one merge requests contained in an ADT A40 message. These multiple requests are specified by separate PID and MRG segment pairs.
- The Patient ID of the patient specified by the 'Patient Identifier List' element of the PID segment is updated with the Patient ID of the patient specified by the 'Prior Patient Identifier List' element of the MRG segment if the 'Prior Patient' doesn't exist in Visage 7.
- The patient demographics (Patient's Name, Patient ID, Patient's Birth Date and Time, Patient's Sex) of the patient specified by the 'Prior Patient Identifier List' element of the MRG segment are updated if the patient specified by the 'Patient Identifier List' element of the PID segment doesn't exist in Visage 7.

Constraints:

- A PIR process can only be performed for patients with a valid Patient ID.
- PIR requests for patients which are not available in Visage 7 are ignored.
- A PIR process cannot be performed if it affects two or more patients with identical Patient IDs.
- Visage 7 cannot perform a PIR process if it results in two or more identical patients.
- A patient cannot be merged into another patient with the same Patient ID.
- For PIR jobs no retry and visualization mechanisms are provided.
- When a PIR process is performed HTML reports stored in Visage 7 are either deleted or a warning text is added to the document depending on the configuration settings.

5.2.4.3 Attribute Processing

The reception of an ADT A40 message results in a PIR process in order to merge two patients or to update the Patient ID of a patient. Therefore it is necessary to convert the HL7 elements contained in the request message into appropriate DICOM attributes. This mapping process is described in chapter 5.5.1.

5.2.4.4 Acknowledgement

Visage 7 sends the acknowledge message after the PIR job was initiated or it is certain that PIR processing could not be performed successfully. In case of an unrecognized patient specified by the 'Patient Identifier List' item Visage 7 ignores the request and responds with status 'Success'. See chapter 5.4 for a detailed acknowledge message description.

5.3 ORM Messages

5.3.1 ORM O01 – Procedure Scheduled/Updated

This message type is used to convey and update a scheduled procedure for a specific patient. Visage 7 only accepts ORM O01 messages without further processing to satisfy the requirements of the IHE Scheduled Workflow Profile.

5.3.1.1 Message Specification

The patient visit update request and acknowledgement is specified by following trigger event and message types:

Trigger Event:	O01
Type of Request Message:	ORM O01
Type of Acknowledge Message:	ACK

5.3.1.2 Segment Description

MSH Segment

Item	Element Name	Data Type	Value
0001	Field Separator	ST	For this element ' ' is expected.
0002	Encoding Characters	ST	For this element '^~\&' is expected.
0009	Message Type	CM	For this element 'ORM^O01' is expected.
0010	Message Control ID	ST	Used to fill the acknowledge message.
0011	Processing ID	PT	Used to fill the acknowledge message.
0012	Version ID	VIT	Used for HL7 version check and to fill the acknowledge message.

PID Segment

Item	Element Name	Data Type	Value
00106	Patient Identifier List	CX	Used to identify the patient for the scheduled procedure. <u>Note:</u> If this field contains more than one identifier only the first one is used for patient identification.
00108	Patient Name	XPN	Name of the patient. <u>Note:</u> If this field contains more than one name only

			the first one is used for the update process.
00110	Date/Time Of Birth	TS	Date/time of birth of the patient.
00111	Sex	IS	Sex of the specified patient.

PV1 Segment

Item	Element Name	Data Type	Value
00133	Assigned Patient Location	PL	Assigned location of the specified patient.
00137	Attending Doctor	XCN	Maps to DICOM Attending Physician
00138	Referring Doctor	XCN	Maps to DICOM Referring Physician
00145	Ambulatory Status	IS	
00149	Visit Number	CX	

ORC Segment

Item	Element Name	Data Type	Value
00215	Order Control	ID	Order Control code, which is one of <ul style="list-style-type: none"> • “NW” for scheduling new procedures • “CA” for canceled procedures • “XA” for updating procedures • “DC” for discontinuing procedures
00216	Placer Order Number	EI	
00217	Filler Order Number	EI	
00219	Order Status	ID	
00226	Ordering Provider	XCN	
00231	Entering Organization	CE	

OBR Segment

Item	Element Name	Data Type	Value
00238	Universal Service ID	CE	
00239	Priority	ID	
00251	Placer Field 1	ST	Maps to the DICOM Accession Number
00252	Placer Field 2	ST	Maps to the DICOM Requested Procedure ID
00253	Filler Field 1	ST	Maps to the DICOM Scheduled Procedure ID
00257	Diagnostic Serv Sect ID	ID	
00263	Reason For Study	CE	
00393	Procedure Code	CE	Maps to DICOM Study Description

ZDS Segment

Item	Element Name	Data Type	Value
Z0001	Study Instance UID	RP	Study Instance UID of the procedure, according to the IHE Technical Framework. The Study Instance UID is contained in the first component of the first field of the ZDS Segment actually.

Notes:

- Visage 7 can handle more than one merge requests contained in an ORM O01 message. These multiple requests are specified by separate ORC and OBR segment pairs.

Constraints:

- Scheduling a Procedure generally needs a valid Study Instance UID or alternatively a unique accession number. If any of these are available, Visage 7 can not process a procedure.

5.3.1.3 Attribute Processing

The information provided with ORM O01 is stored by Visage 7 for further processing. If DICOM images then are imported, their data is matched against the data from the scheduled procedures stored so far, in order to detect and correct inconsistencies in the images.

For this workflow, it is necessary to convert the HL7 elements contained in the request message into appropriate DICOM attributes. This mapping process is described in chapter 5.5.1 and 5.5.2.

5.3.1.4 Acknowledgement

Visage 7 sends the acknowledge message after the Procedure was initiated/updated or it is certain that it could not be performed successfully. See chapter 5.4 for a detailed acknowledge message description.

5.4 Acknowledge Messages

5.4.1 Message Contents

Visage 7 responds to each received HL7 message with an appropriate acknowledge message. Visage 7 generated acknowledge messages contain the segments whose contents are listed in the following tables.

MSH Segment

Item	Element Name	Data Type	Value
00001	Field Separator	ST	This element is always set to ' '.
00002	Encoding Characters	ST	This element is always set to '^~&'.
00007	Date/Time Of Message	TS	Current date and time when the acknowledge message is created.
00009	Message Type	CM	This element is always set to 'ACK'.
00010	Message Control ID	ST	Message Control ID value from the received message.
00011	Processing ID	PT	Processing ID value from the received message.
00012	Version ID	VIT	Version ID value from the received message.

MSA Segment

Item	Element Name	Data Type	Value
00018	Acknowledgement Code	ID	see section 5.4.2 for the used values.
00010	Message Control ID	ST	Message Control ID value from the received message.
00020	Text Message	ST	Detailed description of the occurred error (only present if Error Condition is not '0').
00023	Error Condition	CE	see section 5.4.2 for the used values.

5.4.2 Message Status

The acknowledge message tells the sender of the HL7 request message the final processing status of the message. For this the acknowledge message contains status information in form of an Acknowledge Code and an Error Condition. The values in the following table are used by the HL7 Interface of Visage 7.

Status	Acknowledge Code	Description	Error Condition
Success	AA	Message accepted	0
Error	AE	Segment sequence error (required segment is missing)	100
	AE	Required field is missing	101
Reject	CR	Unsupported Message Type	200
	CR	The Version ID is not supported	203
	CR	Duplicate key identifier (multiple patients are affected)	205
	AR	Application internal error (an error occurred which makes further processing with this message impossible)	207

5.5 Attribute Mapping

The attributes received with the HL7 messages are used to modify the DICOM objects which are stored within Visage 7. This requires the mapping of the HL7 attributes into DICOM conform data types. In this chapter all the attributes are listed which are converted for the patient information reconciliation process and/or for scheduling procedures.

If not mentioned otherwise, the following applied to all mappings: If the resulting value is longer than the maximum length allowed for the respective DICOM attribute, the value will be truncated.

5.5.1 Patient Information Reconciliation

Patient Identifier List / Prior Patient Identifier List

The HL7 'Patient Identifier' attributes are mapped to the DICOM attribute 'Patient ID'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00106	Patient Identifier List Prior Patient Identifier List	CX	0010,0020	Patient ID	LO

The resulting DICOM value contains the 'ID Number' part of the Patient Identifier List / Prior Patient Identifier List element.

If the resulting value is longer than the maximum length allowed for the DICOM attribute 'Patient ID' (max. 64 characters) the value will be truncated.

Patient Name

The HL7 'Patient Name' attribute is mapped to the DICOM attribute 'Patient's Name'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00108	Patient Name	XPN	0010,0010	Patient's Name	PN

The resulting DICOM value consists of the following parts of the Patient Name element. The character '^' is used as delimiter. Trailing delimiters will be deleted.

- Family Name
- Given Name
- Middle Initial Or Name
- Prefix

- Suffix

Example:

"Smith^John^J^III^DR

If the resulting value is longer than the maximum length allowed for the DICOM attribute 'Patient's Name' (max. 64 characters) the value will be truncated.

Note:

In HL7 messages of Version 2.4 and 2.5 for the Family Name an own component of type FN is provided. For the mapping the whole contents of this component is used. The surname is not extracted explicitly.

Date/Time Of Birth

The HL7 'Date/Time Of Birth' attribute is mapped to the DICOM attributes 'Patient's Birth Date' and 'Patient's Birth Time'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00110	Date/Time Of Birth	TS	0010,0030	Patient's Birth Date	DA
			0010,0032	Patient's Birth Time	TM

The resulting DICOM birth date value consists of year, month and day information in the format yyyymmdd. Following conditions must be kept to make further processing with this value possible:

- Year (yyyy) > 1752 (database constraint)
- Month (mm) between 1 and 12
- Day (dd) between 1 and 31

The resulting DICOM birth time value consists of hours, minutes, seconds and milliseconds information in the format hhmmss.frac. Following conditions must be kept to make further processing with this value possible:

- Hours (hh) between 0 and 23
- Minutes (mm) between 0 and 59
- Seconds (ss) between 0 and 59
- Milliseconds (frac) between 0 and 999

Sex

The HL7 'Sex' attribute is mapped to the DICOM attribute 'Patient's Sex'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00111	Sex	PL	0010,0040	Patient's Sex	CS

If the resulting value is longer than the maximum length allowed for the DICOM attribute 'Patient's Sex' (max. 16 characters) the value will be truncated.

Note:

The HL7 values will not be mapped to appropriate DICOM values if the HL7 element contains 'U', 'A' or 'N' which are not defined in the DICOM standard.

Assigned Patient Location

The HL7 'Assigned Patient Location' attribute is mapped to the DICOM attribute 'Current Patient Location'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00133	Assigned Patient Location	PL	0038,0300	Current Patient Location	LO

The resulting DICOM value consists of the following parts of the Assigned Patient Location element. Each value is preceded with the element name separated by a colon.

- Facility (contains NamespaceID, UniversalID, UniversalIDType separated by SPACE)
- Building
- Floor
- PointOfCare
- Room
- Bed

The actual mapping can be configured on the Visage 7 administration pages: the resulting DICOM Current Patient Location there is set in a configuration string containing wildcards for all the aforementioned fields.

If the resulting value is longer than the maximum length allowed for the DICOM attribute 'Current Patient Location' (max. 64 characters) the value will be truncated.

5.5.2 Scheduling/Updating Procedures

Study Instance UID

The IHE 'Study Instance UID' attribute is mapped to the DICOM attribute 'Study Instance UID'. Note the ZDS Segment is not described in the HL7 specification, but is an enhancement of the IHE technical framework.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
Z0001	Study Instance UID	RP	0020,000	Study Instance UID	UI

			D		
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The resulting DICOM value contains the 'Reference Pointer' (Component 1) part of the Study Instance UID element.

If the resulting value is longer than the maximum length allowed for the DICOM attribute 'Study Instance UID' (max. 64 characters), the HL7 message is rejected.

Accession Number

The HL7 'Placer Field 1' attribute is mapped to the DICOM attribute 'Referring Physicians Name'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00251	Placer Field 1	ST	0008,0050	Accession Number	LO

If the resulting value is longer than the maximum length allowed for the DICOM attribute 'Accession Number' (max. 16 characters), the HL7 message is rejected.

Requested Procedure ID

The HL7 'Placer Field 2' attribute is mapped to the DICOM attribute 'Requested Procedure ID'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00252	Placer Field 2	ST	0040,1001	Requested Procedure ID	SH

Scheduled Procedure Step ID

The HL7 'Filler Field 1' attribute is mapped to the DICOM attribute 'Scheduled Procedure Step ID'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00253	Filler Field 1	ST	0040,0009	Scheduled Procedure Step ID	SH

Referring Physicians Name

The HL7 'Procedure Code' attribute is mapped to the DICOM attribute 'Referring Physicians Name'.

HL7			DICOM		
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Item	Element Name	Type	Tag	Attribute Name	VR
00138	Referring Doctor	XCN	0008,0090	Referring Physicians Name	PN

The resulting DICOM value consists of the following parts of the Referring Doctor element. The character '^' is used as delimiter. Trailing delimiters will be deleted.

- Family Name
- Given Name
- Middle Initial Or Name
- Prefix
- Suffix

Study Description

The HL7 'Procedure Code' attribute is mapped to the DICOM attribute 'Study Description'.

HL7			DICOM		
Item	Element Name	Type	Tag	Attribute Name	VR
00393	Procedure Code	CE	0008,1030	Study Description	LO

The resulting DICOM value contains the 'Alternate Text' component of the Procedure Code.

5.5.3 Configuration

Visage 7 provides an administration interface for configuring the HL7 Interface. The parameters listed in the following table can be changed by the administrator to integrate Visage 7 properly in the HL7 network environment.

Parameter	Description	Default Value
HL7 Interface enabled	Enables/Disables the HL7 Network Interface	Disabled
TCP/IP Port	The HL7 Interface listens on this port number for incoming HL7 messages.	2020
Timeout [sec]	Time span (in sec) to wait for an incoming message after a connection was initiated or a previous message was received (inactivity timeout).	60
HL7 Character Encoding	Character encoding of incoming / outgoing HL7 messages. One of UTF-8, ansi (code page 1252), Mac (code page 10000), and default (standard Microsoft Windows® encoding)	UTF-8
DICOM Current Patient Location String	Describes the mapping of HL7 Assigned Patient Location to the DICOM Current Patient Location. See section 5.5.1.	\$PointOfCare{, Room \$Room{, Bed \$Bed}}
Always Update DICOM Files	Allows to enable or disable updating the DICOM files for Patient Information Reconciliation if the values in database are already up-to-date.	Disabled
Update Current Patient Location in DICOM Files	Allows to enable or disable the patient location in the DICOM files.	Disabled
Delete Private DICOM Attributes Delete Overlays Delete Curves Delete HTML Reports	These parameters specify how non-changeable DICOM elements and HTML reports are handled when a PIR process is performed.	Enabled Enabled Enabled Enabled