

# STORZ

**KARL STORZ — ENDOSKOPE**

en

**HL7 Conformance Statement**  
**SCENARA .procedures Version 3 - WS11120**



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# 1 Important information for use of HL71

## 1.1 General

This document describes the HL7 structures and processing rules, which are important for the receipt and dispatch of messages via the HL7 Server.

In practice, HL7 messages and their fields are often customized to varying degrees. This document describes our default settings. For detailed inquiries about custom adjustments please contact [technicalsupport@karlstorz.com](mailto:technicalsupport@karlstorz.com).

## 1.2 Encoding of messages

The encoding is subject to HL7 rules. When receiving and sending messages, escape sequences are taken into account. The interpretation of ASCII codes above the value 128 ("8 bit ASCII") correlates to the configured encoding in the according receiver/provider. By default UTF-8 is used.

## 1.3 Dependency of versions

The HL7 Server is able to receive and send messages from HL7 versions 2.x. The present documentation uses HL7 v2.5. The data fields, which are relevant for working with the system, can be read from virtually any HL7 version.

## 1.4 Context of patients and cases

A message always refers to a single order/procedure for a single patient visit.

## 2 Transport layer

### 2.1 TCP/IP interface

The system offers a TCP/IP server for receiving and sending HL7 messages over MLLP (Minimal Lower Layer Protocol).

MLLP guarantees In Order delivery of HL7 content. MLLP supports all single-byte character encodings (e. g. iso-8859-x, cp1252) as well as UTF-8.

According message format characters (Begin of message, End of Message and Segment terminator) are configurable.

### 2.2 File transfer interface

While not enabled by default, the system can be configured to receive and send messages through text files.

When receiving and sending, either every message can be transmitted in a separate file or several messages can be transmitted in one single file.

### 3 HL7 import

For adopting patients and case data, the following HL7 message types can be processed by the system:

- ADT^A01 – Admit / Visit Notification
- ADT^A02 – Transfer a Patient
- ADT^A03 – Discharge / End Visit
- ADT^A04 – Register a Patient
- ADT^A05 – Pre-Admit a Patient
- ADT^A06 – Change an Outpatient to an Inpatient
- ADT^A07 – Change an Inpatient to an Outpatient
- ADT^A08 – Update Patient Information
- ADT^A34 – Merge Patient Information – Patient ID only
- ADT^A40 – Merge Patient – Patient Identifier List
- ORM^O01 – General Order Message

Apart from identifiers (patient, case), also name, first name and date of birth are transferred into system database and carried along in order to ensure a precise allocation. These values are also sent back during export, e.g. with ORU messages.

The HL7 Server reports an Accept Acknowledge (ACK) after receiving and successfully transforming the message. Negative Acknowledges (NACK) will be sent if the message type is unsupported or the content could not be transformed. Any failures after the initial message transformation (e.g. during further transmission) will not be propagated to the sending system.

All expected message segments and evaluated fields are described in the following chapters, based on HL7 version 2.5.

Legend of the table columns:

SEQ	Position of field in pertinent segment
LEN	Maximum field length
DT	Data type of field
OPT	Optionality – R=essential, X=not used, B=included for backward compatibility, O=optional
RP/#	Repetition allowed
TBL#	List of values, reference to HL7-table with vocabularies for the field
ITEM#	Clear ID of this field in HL7-standard
ELEMENT NAME	Description of field

ID fields are required to be filled, so that the affiliated data can be properly stored, e.g. a patient will not be stored without a patient ID. If such fields are optional or not is than dependent on further information.

### 3.1 MSH – message header

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME
1	1	ST	R			00001	Field Separator
2	4	ST	R			00002	Encoding Characters
3	227	HD	O		0361	00003	Sending Application
4	227	HD	O		0362	00004	Sending Facility
5	227	HD	O		0361	00005	Receiving Application
6	227	HD	O		0362	00006	Receiving Facility
7	24	DTM	R			00007	Date/Time of Message
8	40	ST	O			00008	Security
9	15	MSG	R			00009	Message Type
10	199	ST	R			00010	Message Control ID
11	3	PT	R			00011	Processing ID
12	60	VID	R			00012	Version ID
13	15	NM	O			00013	Sequence Number
14	180	ST	O			00014	Continuation Pointer
15	2	ID	O		0155	00015	Accept Acknowledgment Type
16	2	ID	O		0155	00016	Application Acknowledgment Type
17	3	ID	O		0399	00017	Country Code
18	16	ID	O	Y	0211	00692	Character Set
19	250	CWE	O			00693	Principal Language Of Message
20	20	ID	ID		0356	01317	Alternate Character Set Handling Scheme
21	427	EI	O	Y		01598	Message Profile Identifier
22	567	XON	O			01823	Sending Responsible Organization
23	567	XON	O			01824	Receiving Responsible Organization
24	227	HD	O			01825	Sending Network Address
25	227	HD	O			01826	Receiving Network Address

Fields marked as optional in the table are not evaluated.

### 3.2 EVN – event type

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	3	ID	B		0003	00099	Event Type Code
2	24	DTM	R			00100	Recorded Date/Time
3	24	DTM	O			00101	Date/Time Planned Event
4	3	IS	O		0062	00102	Event Reason Code
5	250	XCN	O	Y	0188	00103	Operator ID
6	24	DTM	O			01278	Event Occurred
7	241	HD	O			01534	Event Facility

Fields marked as optional in the table are not evaluated.



### 3.3 PID – patient identification

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00104	Set ID - PID
2	20	CX	B			00105	Patient ID
3	250	CX	R	Y		00106	Patient Identifier List
4	20	CX	B	Y		00107	Alternate Patient ID - PID
5	250	XPN	R	Y	0200	00108	Patient Name
6	250	XPN	O	Y		00109	Mother's Maiden Name
7	24	DTM	O			00110	Date/Time of Birth
8	1	IS	O		0001	00111	Administrative Sex
9	250	XPN	B	Y		00112	Patient Alias
10	705	CWE	O	Y	0005	00113	Race
11	250	XAD	O	Y		00114	Patient Address
12	4	IS	B		0289	00115	County Code
13	250	XTN	O	Y		00116	Phone Number - Home
14	250	XTN	O	Y		00117	Phone Number - Business
15	705	CWE	O		0296	00118	Primary Language
16	705	CWE	O		0002	00119	Marital Status
17	705	CWE	O		0006	00120	Religion
18	250	CX	O			00121	Patient Account Number
19	16	ST	B			00122	SSN Number - Patient
20	25	DLN	B			00123	Driver's License Number - Patient
21	250	CX	O	Y		00124	Mother's Identifier
22	705	CWE	O	Y	0189	00125	Ethnic Group
23	250	ST	O			00126	Birth Place
24	1	ID	O		0136	00127	Multiple Birth Indicator
25	2	NM	O			00128	Birth Order
26	705	CWE	O	Y	0171	00129	Citizenship
27	705	CWE	O		0172	00130	Veterans Military Status
28	705	CWE	B		0212	00739	Nationality
29	24	DTM	O			00740	Patient Death Date and Time
30	1	ID	O		0136	00741	Patient Death Indicator
31	1	ID	O		0136	01535	Identity Unknown Indicator
32	20	IS	O	Y	0445	01536	Identity Reliability Code
33	24	DTM	O			01537	Last Update Date/Time
34	241	HD	O			01538	Last Update Facility
35	705	CWE	C		0446	01539	Species Code

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
36	705	CWE	C		0447	01540	Breed Code
37	80	ST	O			01541	Strain
38	705	CWE	O	2	0429	01542	Production Class Code
39	705	CWE	O	Y	0171	01840	Tribal Citizenship

Transferred into system database:

PID-3	Patient-ID
PID-5	Patient name (name^first name^middle names^suffix^prefix)
PID-7	Date of birth
PID-8	Gender
PID-11	Address (Street^^City^State^Postal Code)
PID-12	Country
PID-19	Social Security Number

### 3.4 PV1 – patient visit

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00131	Set ID - PV1
2	1	IS	R		0004	00132	Patient Class
3	80	PL	O			00133	Assigned Patient Location
4	2	IS	O		0007	00134	Admission Type
5	250	CX	O			00135	Preadmit Number
6	80	PL	O			00136	Prior Patient Location
7	250	XCN	O	Y	0010	00137	Attending Doctor
8	250	XCN	O	Y	0010	00138	Referring Doctor
9	250	XCN	B	Y	0010	00139	Consulting Doctor
10	3	IS	O		0069	00140	Hospital Service
11	80	PL	O			00141	Temporary Location
12	2	IS	O		0087	00142	Preadmit Test Indicator
13	2	IS	O		0092	00143	Re-admission Indicator
14	6	IS	O		0023	00144	Admit Source
15	2	IS	O	Y	0009	00145	Ambulatory Status
16	2	IS	O		0009	00146	VIP Indicator
17	250	XCN	O	Y	0010	00147	Admitting Doctor
18	2	IS	O		0018	00148	Patient Type
19	250	CX	O			00149	Visit Number
20	50	FC	O	Y	0064	00150	Financial Class
21	2	IS	O		0032	00151	Charge Price Indicator
22	2	IS	O		0045	00152	Courtesy Code
23	2	IS	O		0046	00153	Credit Rating
24	2	IS	O	Y		00154	Contract Code
25	8	DT	O	Y		00155	Contract Effective Date
26	12	NM	O	Y		00156	Contract Amount
27	3	NM	O	Y		00157	Contract Period
28	2	IS	O		0073	00158	Interest Code
29	4	IS	O		0110	00159	Transfer to Bad Debt Code
30	8	DT	O			00160	Transfer to Bad Debt Date
31	10	IS	O		0021	00161	Bad Debt Agency Code
32	12	NM	O			00162	Bad Debt Transfer Amount
33	12	NM	O			00163	Bad Debt Recovery Amount
34	1	IS	O		0111	00164	Delete Account Indicator
35	8	DT	O			00165	Delete Account Date

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
36	3	IS	O		0112	00166	Discharge Disposition
37	47	DLD	O		0113	00167	Discharged to Location
38	705	CWE	O		0114	00168	Diet Type
39	2	IS	O		0115	00169	Servicing Facility
40	1	IS	B		0116	00170	Bed Status
41	2	IS	O		0117	00171	Account Status
42	80	PL	O			00172	Pending Location
43	80	PL	O			00173	Prior Temporary Location
44	24	DTM	O			00174	Admit Date/Time
45	24	DTM	O			00175	Discharge Date/Time
46	12	NM	O			00176	Current Patient Balance
47	12	NM	O			00177	Total Charges
48	12	NM	O			00178	Total Adjustments
49	12	NM	O			00179	Total Payments
50	250	CX	O		0203	00180	Alternate Visit ID
51	1	IS	O		0326	01226	Visit Indicator
52	250	XCN	B	Y	0010	01274	Other Healthcare Provider

Transferred into system database:

PID-2	Patient classification (I/O/B/E/R/P)
PID-3	Assigned Room (name^^^^^^^comment^identifier) – only on ADT
PID-7	Attending doctor (ID^name^first name^middle names^suffix^prefix^^^^^^^^^^street^- postal^city^country^state)
PID-8	Referring doctor (ID^name^first name^middle names^suffix^prefix^^^^^^^^^^street^- postal^city^country^state)
PID-9	Consulting Doctor (ID^name^first name^middle names^suffix^prefix^^^^^^^^^^street^- postal^city^country^state)
PID-19	Visit Number
PID-44	Date of admission
PID-45	Date of discharge

Addresses are included in the PV1 segment by default, but many systems have their own way of utilizing these fields. This can be configured individually for each system.

### 3.5 ORC – common order

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	2	ID	R		0119	00215	Order Control
2	427	EI	C			00216	Placer Order Number
3	427	EI	C			00217	Filler Order Number
4	22	EI	O			00218	Placer Group Number
5	2	ID	O		0038	00219	Order Status
6	1	ID	O		0121	00220	Response Flag
7	705	TQ	B	Y		00221	Quantity/Timing
8	200	EIP	O			00222	Parent
9	24	DTM	O			00223	Date/Time of Transaction
10	3220	XCN	O	Y		00224	Entered By
11	250	XCN	O	Y		00225	Verified By
12	3220	XCN	O	Y		00226	Ordering Provider
13	80	PL	O			00227	Enterer's Location
14	250	XTN	O	Y/2		00228	Call Back Phone Number
15	24	DTM	O			00229	Order Effective Date/Time
16	250	CWE	O		9999	00230	Order Control Code Reason
17	250	CWE	O		9999	00231	Entering Organization
18	250	CWE	O		9999	00232	Entering Device
19	250	XCN	O	Y		00233	Action By
20	250	CWE	O		0339	01310	Advanced Beneficiary Notice Code
21	250	XON	O	Y		01311	Ordering Facility Name
22	250	XAD	O	Y		01312	Ordering Facility Address
23	250	XTN	O	Y		01313	Ordering Facility Phone Number
24	250	XAD	O	Y		01314	Ordering Provider Address
25	250	CWE	O		9999	01473	Order Status Modifier
26	60	CWE	C		0552	01641	Advanced Beneficiary Notice Override Reason
27	24	DTM	O			01642	Filler's Expected Availability Date/ Time
28	250	CWE	O		0177	00615	Confidentiality Code
29	250	CWE	O		0482	01643	Order Type
30	250	CNE	O		0483	01644	Enterer Authorization Mode
31	250	CWE	O			02287	Parent Universal Service Identifier

Transferred into system database:

ORC-1	Order Control (NW, IP, OC, CA, CM, SC, XO)
ORC-2	Order number
ORC-7.3	Planned duration (optional, if set overrides OBR-8, use of both OBR-7 and OBR-8 is suggested)
ORC-1	Assigned Room (identifier^name) – only on ORM

### 3.6 OBR – observation request

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00237	Set ID – OBR
2	427	EI	C			00216	Placer Order Number
3	427	EI	C			00217	Filler Order Number
4	705	CWE	R		9999	00238	Universal Service Identifier
5	2	ID	B			00239	Priority
6	24	DTM	B			00240	Requested Date/Time
7	24	DTM	C			00241	Observation Date/Time #
8	24	DTM	O			00242	Observation End Date/Time #
9	722	CQ	O			00243	Collection Volume *
10	3220	XCN	O	Y		00244	Collector Identifier *
11	1	ID	O		0065	00245	Specimen Action Code *
12	705	CWE	O		9999	00246	Danger Code
13	300	ST	O			00247	Relevant Clinical Information
14	24	DTM	B			00248	Specimen Received Date/Time *
15	300	SPS	B			00249	Specimen Source
16	3220	XCN	O	Y		00226	Ordering Provider
17	2743	XTN	O	Y/2		00250	Order Callback Phone Number
18	199	ST	O			00251	Placer Field 1
19	199	ST	O			00252	Placer Field 2
20	199	ST	O			00253	Filler Field 1 +
21	199	ST	O			00254	Filler Field 2 +
22	24	DTM	C			00255	Results Rpt/Status Chng - Date/Time +
23	504	MOC	O			00256	Charge to Practice +
24	10	ID	O		0074	00257	Diagnostic Serv Sect ID
25	1	ID	C		0123	00258	Result Status +
26	977	PRL	O			00259	Parent Result +
27	705	TQ	B	Y		00221	Quantity/Timing
28	3220	XCN	O	Y		00260	Result Copies To
29	855	EIP	O			00261	Parent
30	20	ID	O		0124	00262	Transportation Mode
31	705	CWE	O	Y	9999	00263	Reason for Study
32	831	NDL	B			00264	Principal Result Interpreter +
33	831	NDL	B	Y		00265	Assistant Result Interpreter +
34	831	NDL	B	Y		00266	Technician +

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
35	831	NDL	B	Y		00267	Transcriptionist +
36	24	DTM	O			00268	Scheduled Date/Time +
37	16	NM	O			01028	Number of Sample Containers *
38	705	CWE	O	Y	9999	01029	Transport Logistics of Collected Sample *
39	705	CWE	O	Y	9999	01030	Collector's Comment *
40	705	CWE	O		9999	01031	Transport Arrangement Responsibility
41	30	ID	O		0224	01032	Transport Arranged
42	1	ID	O		0225	01033	Escort Required
43	705	CWE	O	Y	9999	01034	Planned Patient Transport Comment
44	705	CNE	O		0088	00393	Procedure Code
45	705	CNE	O	Y	0340	01316	Procedure Code Modifier
46	705	CWE	O	Y	0411	01474	Placer Supplemental Service Information
47	705	CWE	O	Y	0411	01475	Filler Supplemental Service Information
48	705	CWE	C		0476	01646	Medically Necessary Duplicate Procedure Reason
49	2	IS	O		0507	01647	Result Handling
50	705	CWE	O			02286	Parent Universal Service Identifier

Transferred into system database:

OBR-4	Type of procedure (code^text)
OBR-7	Start of procedure (date)
ORC-8	End of procedure (date) (suggested, only used if ORC 7.3 is empty)
OBR-12	Danger/Risk Information (free text, no subsegments)
OBR-13	Additional Information
OBR-18	Additional Information
OBR-19	Additional Information
OBR-20	Assigned Room comment (free text) – only on ORM
OBR-32	Additional involved personnel (ID^name^first name^middle names^suffix^prefix^^^^^^^^^^street^- postal^city^country^state)
OBR-33	Additional involved personnel (ID^name^first name^middle names^suffix^prefix^^^^^^^^^^street^- postal^city^country^state)
OBR-34	Additional involved personnel (ID^name^first name^middle names^suffix^prefix^^^^^^^^^^street^- postal^city^country^state)



The roles performed by the additional personnel in OBR 32-34 can be customized per installation (one role per field). In OBR-20 a character sequence may be used to signify a line break in displays. This sequence is configurable.

## 4 HL7 export

The system sends an export message when a report is generated or updated.

The message types below are used for exporting by default:

- ORU^R01 – transmit result

The following chapters list all fields that are filled in export messages by default.

### 4.1 MSH – message header

MSH-3	Sending App
MSH-5	Receiving App
MSH-7	Date/Time of message
MSH-9	Message Type
MSH-11	Processing ID
MSH-12	Version ID

### 4.2 PID – patient identification

PID-2	Patient-ID
PID-5	Patient name (name^first name^middle names^suffix^prefix)
PID-7	Date of birth
PID-8	Gender

### 4.3 PV1 – patient visit

PV1-2	Patient classification (I/O/E/P/U)
PV1-19	Visit Number
PV1-44	Date of admission
PV1-45	Date of discharge

### 4.4 ORC – common order

ORC-2	Order number
ORC-5	Order status

### 4.5 OBR – observation request

OBR-2	Order number
OBR-4	Type of procedure (code^text)
OBR-7	Start of procedure
OBR-8	End of procedure
OBR-25	Result status

## 5 Example messages

### 5.1 ORM

**MSH|^~\&|HL7\_SENDING\_APP|HL7\_RECEIVING\_APP|20200519152216||ORM^O01||P|2.5|**  
**EVN|O01|20200519152216**  
**PID||PATIENT\_1234567||Henry^Barbier^Christian^^Mr.||19530215000000|M||**  
**Street^^City^State^00000|DE|||||SSN|||||**  
**PV1|||||DN13579^Miller^J.^M.D.|DN12368^Smith^R.^M.D.|||||**  
**CASE\_302010|||||20200510095841|20200519150000|||||**  
**ORC|SC|O20200511095841|||||0100|||||R0.10^OR 010 (OP 10)|||**  
**OBR|||SURG^Surgery||20200510103000|20200510113000|||||Location**  
**Information|||||DN02468^Johnson^L.^M.D.|||||**

Note that all data in this message is fictional. Some fields have been left empty intentionally (e.g. address information for practitioners).

For better recognition HL7 line beginnings have been marked in bold font.

### 5.2 ADT

**MSH|^~\&|HL7\_SENDING\_APP|HL7\_RECEIVING\_APP|20200519152216||ADT^A01||P|2.5|**  
**EVN|A01|20200519152216**  
**PID||PATIENT\_1234567||Henry^Barbier^Christian^^Mr.||19530215000000|M||**  
**Street^^City^State^00000|DE|||||SSN|||||**  
**PV1|||OR 010 (OP 10)^^^^^^^Location**  
**Information^R0.10|||||DN13579^Miller^J.^M.D.|DN12368^Smith^R.^M.D.|||||**  
**CASE\_302010|||||20200510095841|20200519150000|||||**

Note that all data in this message is fictional. Some fields have been left empty intentionally (e.g. address information for practitioners).

For better recognition HL7 line beginnings have been marked in bold font.

### 5.3 ADT (Merge)

**MSH|^~\&|HL7\_SENDING\_APP|HL7\_RECEIVING\_APP|20200519152216||ADT^A34||P|2.5|**  
**EVN|A34|20200519152216**  
**PID||PATIENT\_1234567||Henry^Barbier^Christian^^Mr.||19530215000000|M||**  
**Street^^City^State^00000|DE|||||SSN|||||**  
**MRG|PATIENT\_1234555|**

Note that all data in this message is fictional. Some fields have been left empty intentionally (e.g. address information for practitioners).

For better recognition HL7 line beginnings have been marked in bold font.

### 5.4 ORU

**MSH|^~\&|HL7\_SENDING\_APP|HL7\_RECEIVING\_APP|20200519152216||ORU^R01||P|2.5|**  
**PID|1|PATIENT\_1234567||Henry^Barbier^Christian^^Mr.||19530215000000|M|**  
**PV1|1|CASE\_302010|||||20200510095841|20200519150000|**  
**ORC|1|O20200511095841||CM|**  
**OBR|1|O20200511095841||SURG^Surgery||20200510103202|20200510114500|||||F|**

Note that all data in this message is fictional.

For better recognition HL7 line beginnings have been marked in bold font.

## 6 Additional hints

The received information will be used in other systems and protocols as well. Those may imply additional restrictions on certain values, such as identifiers or codes. The most notable of such protocols is the DICOM protocol.

It is suggested, to restrict identifiers and codes to no more than 16 characters, to not use whitespaces or special characters of any kind and at least for codes to use only uppercase characters of the ASCII set.

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