HORIBA Medical

Yumizen P8000

Multi Connection System from V1.6.x

Output Format for Host Connection

Ref: RAA088BEN

Output Format for Host Connection

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Output Format for Host Connection
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Contents

1. Foreword

1.1. Document Update

1.1.1. Revisions

Internal Reference	Software Version used for Documentation	Document Date Issued
RAA088AEN	1.6.x	03/2023
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This document applies to the latest software version listed and higher versions.

When a subsequent software version changes the information in this document, a new electronic edition is released and supplied by HORIBA Medical.

This document is only available online at www.horiba-abx.com/documentation.

1.1.2. What's New?

Update	Chapter
Parameter added: ESR	■ Parameters ■ OBR - Observation Request Segment
Control added: ESRtrol	■ OBR - Observation Request Segment ■ OBX - Observation Result Segment
New comments list updated	Suspected Pathologies

2. HL7 Format

2.1. Protocol Description

2.1.1. Overview

This document is intended as a guide for software developers responsible for creating the interface between a hospital (or laboratory) information system (LIS/LIMS/EMR) application and Yumizen P8000. It is assumed that these software developers are familiar with the HL7 standard and have the HL7 specification documents available for reference.

Message structure

The following table briefly describes concepts used when describing the HL7 high level protocol. For further details refer to the original HL7 standard specification.

Concept	Definition
Message	A complete, self-contained entity of data. An example of a message is a complete patient test result including patient identification, order information, parameter values and error messages.
Segment	A message is composed with segments each containing related elements of data (attributes). Examples of segments are the patient information segment keeping all the patient data that is common to all tests and the order segment keeping data that is common for the individual test.
Field	Each segment has a number of fields each holding one or more data elements (attributes). For instance, the patient information segment has a field containing the patients name and a field holding the patients birth date.
Component field	A field may be divided into several component fields. The name field of the patient information segment has the components last name, first name and middle initials.

Messages consist of segments of various types that are listed in the table below:

Segment Type	Name
MSH	Message Header Segment
MSA	Message Acknowledgement Segment
PID	Patient Identification Segment
PV1	Patient Visit Segment
ORC	Common Request Segment
TQ1	Timing/Quantity Segment
OBR	Observation Request Segment
SPM	Specimen Segment
OBX	Observation Result Segment
NTE	Notes and Comments Segment
SAC	Specimen Container Segment

To report results Yumizen P8000 sends messages to the LIMS as a sequence of segments.

Delimiters

Delimiters are used to separate the segment into fields and field components. Delimiters may vary from implementation to implementation, and are defined as part of the header segment.

The following delimiters are used in Yumizen P8000:

Delimiter	Name	Dec. Code	Hex. Code
|	Field Delimiter	124	7C
~	Repeat field delimiter	126	7E
^	Component field delimiter	94	5E
&	Sub component delimiter	38	26
|	Escape character	91	5C

Fields

A field is a string of characters.

HL7 does not take into account how systems store data within an application.

When fields are transmitted, they are sent as character strings.

Whether the field is required, optional, or conditional in a segment, this information is provided in the column labeled OPT.

The designations are:

Designation	Description
R	Required
RE	Required but may be Empty: The field or data type component description must stipulate when the field or data type component may be empty.
O	Optional
C	Conditional on the triggered event or on some other field(s). The field definitions following the segment attribute table should specify the algorithm that defines the conditionality for this field.
X	Not used with this triggered event
B	Left in for backward compatibility with previous versions of HL7. The field definitions following the segment attribute table should denote the optionality of the field for prior versions.
W	Withdrawn
CE	Conditional but it may be empty

Date Format

Dates are always sent as: YYYYMMDD.

Times are always sent as: HHMMSS.

Dates and Times together are sent as: YYYYMMDDHHMMSS. When Yumizen P8000 receives a Date or Date/Time, the following formats are allowed: YYYYMMDD, YYYYMMDDHHMM and YYYYMMDDHHMMSS.

Decimal values are transmitted with a “.” character as the decimal separator.

2.1.2. Interface Description

Yumizen P8000 needs to populate its own database with data regarding samples worked by laboratory instruments.

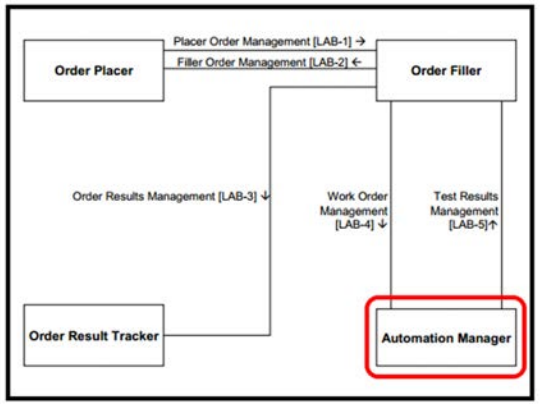
This information is usually received from an external system.

The Yumizen P8000 HL7 interface provides a correct data flow from that system to Yumizen P8000 database.

- The external system must encapsulate requests information in an HL7 message and send it to Yumizen P8000 HL7 interface.
  This process is called *requests downloading* in the Yumizen P8000 worklist.
- Yumizen P8000 is capable to send results regarding samples to an external system when result information is ready.
  The Yumizen P8000 HL7 interface encapsulates sample results data in HL7 messages and sends the messages to the external system.
  This process is called *results uploading*' in the Yumizen P8000 workflow.
- The charset settings available are:
  - UTF-8 (used by default)
  - windows-1252
  - ISO-8859-15
- LIS must communicate with two lines (the connection remains after each result sent to LIS):
  - Port 10001 as client for requests sent from LIS to Yumizen P8000. The communication closes after the end of the message.
  - Port 10002 as server for results sent from Yumizen P8000 to LIS.

2.1.3. Automation Manager Scenario

This integration scenario applies when Yumizen P8000 plays the role of the Automation Manager. The connected external system (usually a LIS) is an Order Filler, as shown in the following diagram.



The transactions supported for this scenario are:

- The external system sends orders to Yumizen P8000 (requests downloading): the interaction is similar to one described in the transaction *"Work Order Management (LAB-4)"* of IHE Laboratory Technical Framework. As stated in the IHE document *"This transaction is used if the Order Filler issues a new order to the Automation Manager"*.
- Yumizen P8000 sends results to the external system (results uploading): the interaction is similar to one described in the transaction *"Test Results Management (LAB-5)"* of IHE Laboratory Technical Framework. As stated in the IHE document *"This transaction is used when Automation Manager transmits test results to Order Filler"*.

2.1.4. Message Structure

The following table lists the message types supported by Yumizen P8000 for the laboratory testing workflow transactions:

Message	Description
OML^O33 Laboratory order for multiple order related to a single specimen	Specimen oriented order information used to send request from an external system to Yumizen P8000 (requests downloading).
ORL^O34 Laboratory order response	Application Acknowledgement/Rejection of an request message send from Yumizen P8000 to an external system.
OUL^R22 Unsolicited Specimen Observation Message	Specimen oriented result values used to send results from Yumizen P8000 to an external system (results uploading).
ORU^R01 Unsolicited Observation Message	Specimen oriented QC result values used to send QC results from Yumizen P8000 to an external system (QC results uploading).
ACK Generic Acknowledgement Message	Commit Acknowledgement/Rejection of a message used for both request and result message.

2.1.4.1. OML^O33^OML_O33

The following table lists the detailed structure for message OML^O33 used to send request from an external system to Yumizen P8000:

Segment	Meaning	Usage	Card.
MSH	Message Header	R	[1..1]
[	--- PATIENT begin	R	[1..1]
PID	Patient Identification	R	[1..1]
PV1	Patient Visit	RE	[0..1]
]	--- PATIENT end		
{	--- SPECIMEN begin	R	[1..*]

Segment	Meaning	Usage	Card.
SPM	Specimen	R	[1..1]
{	--- ORDER begin		
ORC	Common Order	R	[1..1]
[{TQ1}]	Timing Quantity	R	[0..1]
[	--- OBSERVATION_REQUEST begin	O	[0..*]
OBR	Observation Request	R	[1..1]
[{OBX}]	Observation Request Result (Clinical Info)	O	[0..*]
[{	--- PRIOR_RESULT begin	O	[0..*]
PV1	Patient Visit - previous result	R	[1..1]
[ORC]	Common Order - previous result	R	[1..1]
OBR	Order Detail - previous result	R	[1..1]
[OBX]	Observation Result - previous result	R	[1..*]
[{ NTE }]	Notes and Comments - previous result	C	[0..*]
}]	--- PRIOR_RESULT end		
]	--- OBSERVATION_REQUEST end		
}	--- ORDER end		
}	--- SPECIMEN end		

2.1.4.2. OUL^R22^OUL_R22

The following table lists the detailed structure for message OUL^R22 used to send results from Yumizen P8000 to an external system.

Segment	Meaning	Usage	Card.
MSH	Message Header	R	[1..1]
[PID]	Patient Identification	R	[1..1]
PV1	Patient Visit	R	[0..1]
{	--- SPECIMEN begin	R	[1..*]
SPM	Specimen information	R	[1..1]
[{OBX}]	Observation Result (for Specimen)	O	[0..*]
{	--- ORDER begin	R	[1..*]
OBR	Observation order	R	[1..1]
ORC	Common order	R	[1..1]
[{	--- RESULT begin	R	[0..*]
OBX	Observation Result	R	[1..1]
[{NTE}]	Notes and Comments	O	[0..*]
}]	--- RESULT end		
}	--- ORDER end		
}	--- SPECIMEN end		

2.1.4.3. ORU^R01

The following table lists the detailed structure for message ORU^R01 used to send QC results from Yumizen P8000 to an external system.

Segment	Meaning	Usage	Card.
MSH	Message Header	R	[1..1]
{	--- ORDER begin	R	[1..*]
OBR	Observation order	R	[1..1]
[{	--- RESULT begin	R	[0..*]
OBX	Observation Result	R	[1..1]
}]	--- RESULT end		
}	--- ORDER end		

2.1.4.4. ACK / ORL^O34^ORL_O34

The following table lists the detailed structure for message ACK used to acknowledge message reception by both Yumizen P8000 and an external system:

Segment	Meaning	Usage	Card.
MSH	Message Header	R	[1..1]
MSA	Message Acknowledgement	R	[1..1]
[ERR]	Error	O	[0..1]

2.2. OUL and OML Messages Segments

2.2.1. MSH - Message Header Segment

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message.

The Message Header segment contains general information and identifies the sender. The Message Header segment is always the first record in a transmission.

2.2.1.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**MSH**
1	1	R	[1..1]	Field Separator	| (Pipe)
2	4	R	[1..1]	Encoding characters	**^~\&** ^: sub field delimiter ~: repeat sub field delimiter \: ESCAPE sequence &: sub filed component delimiter
3	20	R	[1..1]	Sending Application	**LIS** NameSpace ID: LIS
4		R	[1..1]	Sending Facility	**LIS** NameSpace ID: LIS
5		R	[1..1]	Receiving Application	**YP8K** NameSpace ID: YP8K
6		R	[1..1]	Receiving Facility	**YP8K** NameSpace ID: YP8K
7	14	R	[1..1]	Date/Time of message	**20160416090430**
8		X		Security	
9		R	[1..1]	Message Type	**OML^O33^OML_O33**: request Message code ID: OML Trigger event ID: 033 Message structure ID: OML_033
10		R	[1..1]	Message Control ID	**18698910009**
11	1	R	[1..1]	Processing ID	**P** P (Production) D (Debugging) Default setting depending on user profile: ■ Tech: D ■ Others: P
12		R	[1..1]	Version ID	**2.5**
13		X		Sequence number	

SEQ	LEN	OPT	Card.	Element name	Example
14		X		Continuation Pointer	
15		X		Accept Acknowledgment Type	
16		X		Application Acknowledgment Type	
17		X		Country Code	
18		X		Character Set	UNICODE UTF-8
19		X		Principal language of message	
20		X		Alternate Character Set Handling Scheme	
21		X		Message Profile Identifier	

Example of a message sent by LIS:
MSH|^~\&|LIS|LIS|YP8K|YP8K|20160416090430||OML^O33^OML_O33|18698910009|P|2.5|||||||

2.2.1.2. From Yumizen P8000 to LIS

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**MSH**
1	1	R	[1..1]	Field Separator	| (Pipe)
2	4	R	[1..1]	Encoding characters	**^~\&**
					^: sub field delimiter
					~: repeat sub field delimiter
					\: ESCAPE sequence
					&: sub filed component delimiter
3	20	R	[1..1]	Sending Application	**YP8K**
					NameSpace ID: YP8K
4		R	[1..1]	Sending Facility	NameSpace ID : Empty
5		R	[1..1]	Receiving Application	NameSpace ID: Empty
6		R	[1..1]	Receiving Facility	NameSpace ID: Empty
7	14	R	[1..1]	Date/Time of message	**20160705100955**
8		X		Security	
9		R	[1..1]	Message Type	**OUL^R22^OUL_R22**: results
					Message code ID: OUL
					Trigger event ID: R22
					Message structure ID: OUL_R22
10		R	[1..1]	Message Control ID	**YP8K20160705100955**
11	1	R	[1..1]	Processing ID	**P** P (Production) D (Debugging) Default setting depending on user profile: ■ Tech: D ■ Others: P
12		R	[1..1]	Version ID	**2.5**
13		X		Sequence number	
14		X		Continuation Pointer	
15		X		Accept Acknowledgment Type	
16		X		Application Acknowledgement Type	
17		X		Country Code	
18		X		Character Set	UNICODE UTF-8
19		X		Principal language of message	
20		X		Alternate Character Set Handling Scheme	
21		X		Message Profile Identifier	

Example of a message sent by Yumizen P8000:
MSH|^~\&|YP8K|^^|^^|^^|20160705100955||OUL^R22^OUL_R22|
YP8K20160705100955|P|2.5|||||||

2.2.2. PID - Patient Identification Segment

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information.

2.2.2.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**PID**
1		X		Set ID - PID	
2		X		Patient ID	
3	34	R	[1..*]	Patient Identifier List	**P0002^^^LIS^PI**
	25				ID number: P0002
					Check Digit: empty
					Check Digit Scheme: empty
	3				Assigning authority: LIS
	2				Identifier Type Code: PI
4		X		Alternate Patient ID - PID	
5		O	[1..1]	Patient Name	**DOE^JOHN^^**
	30				Family Name: DOE
	30				Given Name: JOHN
					Second and Further Given Names or Initials Thereof: empty
					Suffix: empty
6		X		Mother's maiden name	
7	8	R	[0..1]	Date/Time of Birth	**19601206** Date of Birth Format = YYYYMMDD
8	1	R	[1..1]	Administrative Sex	**M** M : Male F: Female U: Unknown
9		X		Patient Alias	
10		X		Race	
11		O	[0..*]	Patient Address	**Main Street^^Springfield^NY^65466^USA^ATC1**
	120				Street address: Main Street
					Other designation: empty
	100				City: Springfield
	50				State or province: NY
	20				Zip or postal code: 65466
	15				Country: USA
	5				Address type: ATC1
12		X		Country Code	
13	50	O	[0..1]	Phone Number - Home	**0033412364567**
14		X		Phone Number - Business	
15		X		Primary Language	
16		X		Marital Status	

SEQ	LEN	OPT	Card.	Element name	Example
17		X		Religion	
18		X		Patient Account Number	
19		X		SSN Number Patient	
20		X		Driver License Number Patient	
21		X		Mother's Identifier	
22		X		Ethnic Group	
23		X		Birth Place	
24		X		Multiple Birth Indicator	
25		X		Birth Order	
26		X		Citizenship	
27		X		Veterans Military Status	
28		X		Nationality	
29		X		Patient Death Date and Time	
30		X		Patient Death Indicator	
31	1	R	[0..1]	Identity Unknown Indicator	**N**
32	2	R	[0..*]	Identity Reliability Code	**AL**
33		X		Last Update Date/Time	
34		X		Last Update facility	
35		X		Species Code	
36		X		Breed Code	
37		X		Strain	
38		X		Production Class Code	
39		X		Tribal Citizenship	

Example of a patient identification segment sent by LIS:
PID|||P0002^^^LIS^PI||DOE^JOHN^^||19601206|M|||Main Street^^Springfield^NY^65466^USA^ATC1||0033412364567|||||||||||||||N|AL

2.2.2.2. From Yumizen P8000 to LIS

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**PID**
1		X		Set ID - PID	
2		X		Patient ID	
3	34	R	[1..*]	Patient Identifier List	**P0002^^^LIS^PI**
	25				ID number: P0002
					Check Digit: empty
					Check Digit Scheme: empty
	3				Assigning authority: LIS
	2				Identifier Type Code: PI
4		X		Alternate Patient ID - PID	
5		O	[1..1]	Patient Name	**DOE^JOHN^^**
	30				Family Name: DOE
	30				Given Name: JOHN
					Second and Further Given Names or Initials Thereof: empty
					Suffix: empty
6		X		Mother's maiden name	
7	8	R	[0..1]	Date/Time of Birth	**19601206** Date of Birth Format = YYYYMMDD
8	1	R	[1..1]	Administrative Sex	**M** M: Male F: Female U: Unknown
9		X		Patient Alias	
10		X		Race	

SEQ	LEN	OPT	Card.	Element name	Example
11		O	[0..*]	Patient Address	**Main Street^^Springfield^NY^ 65466^USA^ATC1**
	120				Street address: Main Street
					Other designation: empty
	100				City: Springfield
	50				State or province: NY
	20				Zip or postal code: 65466
	15				Country: USA
	5				Address type: ATC1
12		X		Country Code	
13	50	O	[0..1]	Phone Number - Home	
14		X		Phone Number - Business	
15		X		Primary Language	
16		X		Marital Status	
17		X		Religion	
18		X		Patient Account Number	
19		X		SSN Number Patient	
20		X		Driver License Number Patient	
21		X		Mother's Identifier	
22		X		Ethnic Group	
23		X		Birth Place	
24		X		Multiple Birth Indicator	
25		X		Birth Order	
26		X		Citizenship	
27		X		Veterans Military Status	
28		X		Nationality	
29		X		Patient Death Date and Time	
30		X		Patient Death Indicator	
31	1	RE	[0..1]	Identity Unknown Indicator	**Y**
32	2	CE	[0..*]	Identity Reliability Code	
33		X		Last Update Date/Time	
34		X		Last Update facility	
35		X		Species Code	
36		X		Breed Code	
37		X		Strain	
38		X		Production Class Code	
39		X		Tribal Citizenship	

Example of a patient identification segment sent by Yumizen P8000:
PID|||P0002^^^LIS^PI||DOE^JOHN^^^^^||19601206|M|||Main Street^^Springfield^NY^65466^USA^ATC1||||||ABC123||||||||||||Y

2.2.3. PV1 - Patient Visit Segment

This segment is used to communicate the location and requestor.

2.2.3.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	O		Segment ID	**PV1**
1		X		Set ID - PV1	
2	1	RE	[1..1]	Patient Class (to categorize patients by site)	**N** E: Emergency I: Inpatient N: Not applicable U: Unknown

SEQ	LEN	OPT	Card.	Element name	Example
3		X		Assigned Patient Location	
4		X		Admission Type	
5		X		Preadmit Number	
6		X		Prior Patient Location	
7		X		Attending Doctor	
8		X		Referring Doctor	
9		X		Consulting Doctor	
10		X		Hospital Service	
11		X		Temporary Location	
12		X		Preadmit Test Indicator	
13		X		Remission Indicator	
14		X		Admit Source	
15		X		Ambulatory Status	
16		X		VIP Indicator	
17		X		Admitting Doctor	
18		X		Patient Type	
19		X		Visit Number	
20		X		Financial Class	
21		X		Charge Price Indicator	
22		X		Courtesy Code	
23		X		Credit Rating	

SEQ	LEN	OPT	Card.	Element name	Example
24		X		Contract Code	
25		X		Contract Effective	
26		X		Contract Effective	
27		X		Contract Period	
28		X		Interest Code	
29		X		Transfer to Bad Debt Code	
30		X		Transfer to Bad Debt Date	
31		X		Bad Debt Agency Code	
32		X		Bad Debt Transfer Amount	
33		X		Bad Debt Recovery Amount	
34		X		Delete Account Indicator	
35		X		Delete Account Date	
36		X		Discharge Disposition	
37		X		Discharged to Location	
38		X		Diet Type	
39		X		Servicing Facility	
40		X		Bed Status	
41		X		Account Status	
42		X		Pending Location	
43		X		Prior Temporary Location	
44	14	RE	[0..*]	Admit Date/Time	**20160416090430**
45	14	RE	[0..*]	Discharge Date/Time	**20160416090430**
46		X		Current Patient Balance	
47		X		Total Charges	
48		X		Total Adjustments	
49		X		Total Payments	
50		X		Alternate Visit ID	
51		X		Visit Indicator	
52		X		Other Healthcare Provider	

Example of a patient visit segment sent by LIS:
PV1||N||||||||||||||||||||||||||||||||||||||||||20160416090430|20160416090430

2.2.3.2. From Yumizen P8000 to LIS

This segment is used to communicate the location and requestor.

SEQ	LEN	OPT	Card.	Element name	Example
0	3	O		Segment ID	**PV1**
1		X		Set ID - PV1	
2	1	R	[1..1]	Patient Class (to categorize patients by site)	**N** E: Emergency I: Inpatient N: Not applicable U: Unknown
3		X		Assigned Patient Location	
4		X		Admission Type	
5		X		Preadmit Number	
6		X		Prior Patient Location	
7		X		Attending Doctor	
8		X		Referring Doctor	
9		X		Consulting Doctor	
10		X		Hospital Service	
11		X		Temporary Location	
12		X		Preadmit Test Indicator	
13		X		Remission Indicator	
14		X		Admit Source	
15		X		Ambulatory Status	
16		X		VIP Indicator	
17		X		Admitting Doctor	
18		X		Patient Type	
19		X		Visit Number	
20		X		Financial Class	
21		X		Charge Price Indicator	
22		X		Courtesy Code	
23		X		Credit Rating	
24		X		Contract Code	
25		X		Contract Effective	
26		X		Contract Effective	
27		X		Contract Period	
28		X		Interest Code	
29		X		Transfer to Bad Debt Code	
30		X		Transfer to Bad Debt Date	
31		X		Bad Debt Agency Code	
32		X		Bad Debt Transfer Amount	
33		X		Bad Debt Recovery Amount	
34		X		Delete Account Indicator	
35		X		Delete Account Date	
36		X		Discharge Disposition	
37		X		Discharged to Location	
38		X		Diet Type	
39		X		Servicing Facility	
40		X		Bed Status	
41		X		Account Status	
42		X		Pending Location	
43		X		Prior Temporary Location	

SEQ	LEN	OPT	Card.	Element name	Example
44	14	RE	[0..*]	Admit Date/Time	**20160416090430**
45	14	RE	[0..*]	Discharge Date/Time	**20160416090430**
46		X		Current Patient Balance	
47		X		Total Charges	
48		X		Total Adjustments	
49		X		Total Payments	
50		X		Alternate Visit ID	
51		X		Visit Indicator	
52		X		Other Healthcare Provider	

Example of a patient visit segment sent by Yumizen P8000:
PV1||N|||||||||||||||||||||||||||||||||||||||||||||||||||20160416090430|20160416090430

2.2.4. SPM - Specimen Segment

The intent of this segment is to describe the characteristics of a specimen.
It contains information about the sample.

2.2.4.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**SPM**
1	1	R	[1..1]	Set ID - SPM	**1**
2	16	R	[0..1]	Sample ID	**201604163002**
3		X		Specimen Parent IDs	
4	15	R	[1..1]	Specimen Type	**BLOOD** or **BODY FLUID** (editable)
5		X		Specimen Type Modifier	
6		X		Specimen Additives	
7		X		Specimen Collection Method	
8	20	RE	[0..1]	Specimen Source Site	**MAIN LAB**
9		X		Specimen Source Site Modifier	
10		X		Specimen Collection Site	
11		X		Specimen Role	
12		X		Specimen Collection Amount	
13		X		Grouped Specimen Count	
14		X		Specimen Description	
15		X		Specimen Handling Code	
16		X		Specimen Risk Code	
17	14	R	[0..1]	Specimen Collection Date/Time	**201604160904**
18	14	R	[0..1]	Specimen Received Date/Time	**201604160904**
19		X		Specimen Expiration Date/Time	
20		X		Specimen availability	
21		X		Specimen Reject Reason	
22		X		Specimen Quality	
23		X		Specimen Appropriateness	
24		X		Specimen Condition	
25		X		Specimen Current Quantity	
26		X		Number of Specimen Containers	
27		X		Container Type	
28		X		Container Condition	
29		X		Specimen Child Role	

Example of a specimen segment sent by LIS:
SPM|1|201604163002||BLOOD||||MAIN LAB|||||||20160416090430|201604160904|||||

2.2.4.2. From Yumizen P8000 to LIS

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**SPM**
1	1	R	[1..1]	Set ID - SPM	**1**
2	16	R	[0..1]	Sample ID	**201604163002**
3		X		Specimen Parent IDs	
4	15	R	[1..1]	Specimen Type	**BLOOD** or **BODY FLUID** (editable)
5		X		Specimen Type Modifier	
6		X		Specimen Additives	
7		X		Specimen Collection Method	
8	20	RE	[0..1]	Specimen Source Site	**MAIN LAB**
9		X		Specimen Source Site Modifier	
10		X		Specimen Collection Site	
11		X		Specimen Role	
12		X		Specimen Collection Amount	
13		X		Grouped Specimen Count	
14		X		Specimen Description	
15		X		Specimen Handling Code	
16		X		Specimen Risk Code	
17	14	X	[0..1]	Specimen Collection Date/Time	
18	14	X	[0..1]	Specimen Received Date/Time	
19		X		Specimen Expiration Date/Time	
20		X		Specimen availability	
21		X		Specimen Reject Reason	
22		X		Specimen Quality	
23		X		Specimen Appropriateness	
24		X		Specimen Condition	
25		X		Specimen Current Quantity	
26		X		Number of Specimen Containers	
27		X		Container Type	
28		X		Container Condition	
29		X		Specimen Child Role	

Example of a specimen segment sent by Yumizen P8000:
SPM|1|201604163002||BLOOD||||MAIN LAB

2.2.5. OBR - Observation Request Segment

In the reporting of clinical data, the OBR serves as the report header. It identifies the observation set represented by the following atomic observations. It includes the relevant ordering information when that applies. It contains many of the attributes that usually apply to all of the included observations.

The Universal Service Identifier field corresponds to any parameters or compatible panels:

CBC
DIF
RET
SLIDE
CBF
RBC_PLTO
ESR

- To request a CBR, send CBC in one group of ORC, TQ1 and OBR frames and RET in another group of ORC, TQ1 and OBR frames.
- To request a DIR, send CBC in one group of ORC, TQ1 and OBR frames, a DIF in another group of ORC, TQ1 and OBR frames and RET in another group of ORC, TQ1 and OBR frames.

2.2.5.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**OBR**
1	1	R	[0..1]	Set ID - OBR	**1**
2	20	R	[0..1]	Placer Order Number (RequestID)	**L604163002**
3	20	R	[0..1]	Filler Order Number (RequestID)	**L604163002**
4		R	[1..1]	Universal Service Identifier	**CBC^CBC profile^YP8K**
	31				Code: CBC
					Name: CBC profile
					Sending application: YP8K
5		X		Priority	
6		X		Requested Date/Time	
7		X		Observation Date/Time #	
8		X		Observation End Date/Time #	
9		X		Collection Volume	
10		X		Collector Identifier	
11		R		Specimen Action Code	**BLOOD** or **BODY FLUID**
12		X		Danger Code	
13		X		Relevant Clinical Information	
14		X		Specimen Received Date/ Time	
15		X		Specimen Source	
16	20	O	[0..1]	Ordering Provider	**DR HOUSE**
17		X		Order Callback Phone Number	
18		X		Placer Field 1	
19		X		Placer Field 2	
20		X		Filler Field 1	
21		X		Filler Field 2	
22		X		Results Rpt/Status Chng Date/Time	
23		X		Charge to practice	
24		X		Diagnostic Serv Sect ID	
25	1	R	[1..1]	Results Status	**P**
26		X		Parent Result	
27		X		Quantity/Timing	
28		X		Result Copies To	
29		X		Parent	
30		X		Transportation Mode	
31		X		Reason for Study	
32		X		Principal Results Interpreter	
33		X		Assistant Results Interpreter	
34		X		Technician	
35		X		Transcriptionist	
36		X		Scheduled Date / Time	
37		X		Number of Sample Container	
38		X		Transport Logistics of Collected Sample	
39		X		Collector Comment	
40		X		Transport Arrangement Responsibility	
41		X		Transport Arranged	
42		X		Escort Required	
43		X		Planned Patient Transport Comment	
44		X		Procedure Code	
45		X		Procedure Code Modifier	
46		X		Placer Supplemental Service Information	

SEQ	LEN	OPT	Card.	Element name	Example
47		X		Filler Supplemental Service Information	
48		X		Medically Necessary Duplicate Procedure Reason	
49		X		Result Handling	
50		X		Parent Universal Service Identifier	

SEQ 2 & 3 fields cannot be empty and must be unique.

Example of an observation result segment sent by LIS:
OBR|1|L604163002|L604163002|CBC^CBC profile^YP8K|||||||BLOOD|||||DR HOUSE|||||||||P

2.2.5.2. From Yumizen P8000 to LIS

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**OBR**
1	1	O	[0..1]	Set ID - OBR	**1**
2	20	RE	[0..1]	Placer Order Number	**L604163002**
3	20	RE	[0..1]	Filler Order Number	**L604163002**
4	31	R	[1..1]	Universal Service Identifier	**RDW-SD^RDW-SD^YP8K**
					Code: RDW-SD
					Name: RDW-SD profile
					Sending application: YP8K
5		X		Priority	
6		X		Requested Date/Time	
7		R		Observation Date/Time #	**20160416090400**
8		X		Observation End Date/Time #	
9		X		Collection Volume	
10		X		Collector Identifier	
11		X		Specimen Action Code	
12		X		Danger Code	
13		X		Relevant Clinical Information	
14		X		Specimen Received Date/ Time	
15		X		Specimen Source	
16	20	RE	[0..1]	Ordering Provider	**DR HOUSE**
17		X		Order Callback Phone Number	
18		X		Placer Field 1	
19		X		Placer Field 2	
20		X		Filler Field 1	
21		X		Filler Field 2	
22		X		Results Rpt/Status Chng Date/Time	
23		X		Charge to practice	
24		X		Diagnostic Serv Sect ID	
25	1	RE	[1..1]	Results Status	**F**
26		X		Parent Result	
27		X		Quantity/Timing	
28		X		Result Copies To	
29		X		Parent	
30		X		Transportation Mode	
31		X		Reason for Study	
32		RE		Principal Results Interpreter	**ruleResult**
33		X		Assistant Results Interpreter	
34		X		Technician	

SEQ	LEN	OPT	Card.	Element name	Example
35		X		Transcriptionist	
36		X		Scheduled Date / Time	
37		X		Number of Sample Container	
38		X		Transport Logistics of Collected Sample	
39		X		Collector Comment	
40		X		Transport Arrangement Responsibility	
41		X		Transport Arranged	
42		X		Escort Required	
43		X		Planned Patient Transport Comment	
44		X		Procedure Code	
45		X		Procedure Code Modifier	
46		X		Placer Supplemental Service Information	
47		X		Filler Supplemental Service Information	
48		X		Medically Necessary Duplicate Procedure Reason	
49		X		Result Handling	
50		X		Parent Universal Service Identifier	

Example of an observation result segment from:
OBR|1|L604163002|L604163002|RDW-SD^RDW-SD^YP8K|||20160416090400|||||||DR HOUSE|||||||F|||||||ruleResult

Example of a comment linked to the sample:
OBR|1|000004|000004|ORDER_COMMENT^Request comment^HALIA|||
20191023104806|||||||Dr Dree|||||||F|||||||

2.2.5.3. OBR - Segment Specifities for Order Comments

OBR segment is different depending on type of information sent:

- order comments
- test code results

The **OBR 4** field contains different data according to the type of information sent.

Order comments are always sent first, then the test codes values are sent.

First order comment	OBR|1|0007954944|0007954944|**^Commentaire de la demande^HALIA**|||20221008085830||||||||INC||||||||F<CR>
	ORC|SC|0007954944|0007954944|0007954944|A|||| 20221008101514<CR>
	TQ1||||||20221008085833||S<CR>
	OBX|1|ST|ORDER_COMMENT^Commentaire de la demande|| Slide done||||||F|||20221008101514<CR>
Second order comment	OBR|2|0007954944|0007954944|**^Commentaire de la demande^HALIA**|||20221008085830||||||||INC||||||||F<CR>
	ORC|SC|0007954944|0007954944|0007954944|A|||| 20221008101514<CR>
	TQ1||||||20221008085833||S<CR>
	OBX|1|ST|ORDER_COMMENT^Commentaire de la demande||Manual count||||||F|||20221008101514<CR>
First result value	OBR|3|0007954944|0007954944|**MCV^VGM^HALIA**||| 20221008085830||||||||INC||||||||F|||||||SARAH<CR>
	ORC|SC|0007954944|0007954944|0007954944|A|||| 20221008101547<CR>
	TQ1||||||20221008085833||S<CR>
	OBX|1|NM|MCV^VGM||87.4|fL|82.0 - 98.0||||F|||20221008091605|||| Yumizen H1500-1<CR>

2.2.6. ORC - Common Order Segment

The Common Order segment (ORC) is used to transmit fields that are common to all orders.

2.2.6.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**ORC**
1	2	R	[1..1]	Order Control	**NW**: New order. Event request in OML message sent by the order placer in transaction LAB-1 or in OML message sent by the order filler in transaction LAB-4. **PR**: Previous values. **RF**: Rerun
2	20	R	[0..1]	Placer Order Number (RequestID)	**L604163002**
3	20	R	[0..1]	Filler Order Number (RequestID)	**L604163002**
4	20	R	[0..1]	Placer Group Number	**L604163002**
5		X		Order Status	
6		X		Response Flag	
7		X		Quantity/Timing	
8		X		Parent	
9	14	R	[0..1]	Date/Time of Transaction	**20160416090430**
10		X		Entered By	
11		X		Verified By	
12		X		Ordering Provider	
13		RE		Enterer's Location (WardID)	**ward01**
14		X		Call Back Phone Number	
15		X		Order Effective Date/Time	
16		X		Order Control Code Reason	
17		X		Entering Organization	
18		X		Entering Device	
19		X		Action By	
20		X		Advanced Beneficiary Notice Code	
21	129	RE		Ordering Facility Name (Ward ID and Wardname)	**hematology^^^^^^^^^ward01**
	100				Ward Name: hematology
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	20				Ward ID: ward01
22		X		Ordering Facility Address	
23		X		Ordering Facility Phone Number	
24		X		Ordering Provider Address	
25		X		Order Status Modifier	
26		X		Advanced Beneficiary Notice Override Reason	
27		X		Filler's Expected Availability Date/Time	
28		X		Confidentiality Code	
29		X		Order Type	
30		X		Enterer Authorization Mode	
31		X		Parent Universal Service Identifier	

SEQ 2, 3 & 4 fields cannot be empty and must be unique.
Ward can be automatically learned from Yumizen P8000. ORC.13 and ORC.21 are required in that case.

Example of a common order segment:
ORC|NW|L604163002|L604163002|L604163002||||20160416090430||||ward01|||||||| hematology^^^^^^^^^ward01

2.2.6.2. From Yumizen P8000 to LIS

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**ORC**
1	2	R	[1..1]	Order Control	From Yumizen to LIS: only **SC**: Status changed
2	20	R	[0..1]	Placer Order Number (RequestID)	**L604163002**
3	20	R	[0..1]	Filler Order Number (RequestID)	**L604163002**
4	20	R	[0..1]	Placer Group Number (RequestID)	**L604163002**
5		R		Order Status	**A**
6		X		Response Flag	
7		X		Quantity/Timing	
8		X		Parent	
9	14	R	[0..1]	Date/Time of Transaction	**20160705100647**
10		X		Entered By	
11		X		Verified By	
12		X		Ordering Provider	
13		X		Enterer's Location	
14		X		Call Back Phone Number	
15		X		Order Effective Date/Time	
16		X		Order Control Code Reason	
17		X		Entering Organization	
18		X		Entering Device	
19		X		Action By	
20		X		Advanced Beneficiary Notice Code	
21	129	RE		Ordering Facility Name (Ward ID and Wardname)	**hematology^^^^^^^^^ward01**
	100				Ward Name: hematology
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	1				not used
	20				Ward ID: ward01
22		X		Ordering Facility Address	
23		X		Ordering Facility Phone Number	
24		X		Ordering Provider Address	
25		X		Order Status Modifier	
26		X		Advanced Beneficiary Notice Override Reason	
27		X		Filler's Expected Availability Date/Time	
28		X		Confidentiality Code	
29		X		Order Type	

SEQ	LEN	OPT	Card.	Element name	Example
30		X		Enterer Authorization Mode	
31		X		Parent Universal Service Identifier	

Example of a common order segment from Yumizen P8000:
ORC|SC|L604163002|L604163002|L604163002|A||||20160705100647||||||||||^^^^^^^^^

2.2.7. TQ1 - Time/Quantity Segment

The timing/quantity segment contains information about the priority and timing of an order.

2.2.7.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**TQ1**
1		X		Set ID - TQ1	
2		X		Quantity	
3		X		Repeat Pattern	
4		X		Explicit Time	
5		X		Relative Time and Units	
6		X		Service Duration	
7	14	R	[0..1]	Start date/time	**20160416090430**
8		X		End date/time	
9	1	R	[0..*]	Priority	**S** S: urgent R: normal
10		X		Condition text	
11		X		Text instruction	
12		X		Conjunction	
13		X		Occurrence duration	
14		X		Total occurrence's	

Example of a timing/quantity segment from LIS:
TQ1||||||20160416090430||S

2.2.7.2. From Yumizen P8000 to LIS

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**TQ1**
1		X		Set ID - TQ1	
2		X		Quantity	
3		X		Repeat Pattern	
4		X		Explicit Time	
5		X		Relative Time and Units	
6		X		Service Duration	
7	14	R	[0..1]	Start date/time	**20160416090430**
8		X		End date/time	
9	1	R	[0..*]	Priority	**S** S: urgent R: normal
10		X		Condition text	
11		X		Text instruction	
12		X		Conjunction	
13		X		Occurrence duration	
14		X		Total occurrence's	

Example of a timing/quantity segment from Yumizen P8000:
TQ1||||||20160416090430||S

2.2.8. NTE - Notes and Comments Segment

The NTE segment is defined here for inclusion in messages defined in other chapters. It is commonly used for sending notes and comments.

NTE segment is always and exclusively linked to a parameter numerical value.

2.2.8.1. From Yumizen P8000 to LIS

The instrument flag linked to a parameter is sent with the possible following values:

- *: if suspected
- X: if rejected
- Characters string

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**NTE**
1		R	[1..1]	Set ID - NTE	**1**
2		X		Source of Comment	
3		RE	[0..1]	Comment	**Lymphoproliferative disorder or viral infection suspicion**
4		X		Comment Type	

Example of a comment linked to a parameter:
OBX|1|NM|HGB^HGB||12.4|g/L|130.0 - 170.0|L~LL|||F|||20180827160639||||Yumizen 1

NTE|1||*<CR>

NTE|2||Anemia<CR>

NTE|3||Panic value<CR>

2.2.9. OBX - Observation Result Segment

The OBX segment is used to transmit a single observation or observation fragment. It represents the smallest indivisible unit of a report.

The LIS can transmit clinical information and/or previous values (according on the ORC.1) using the OBX segment.

2.2.9.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**OBX**
1		R	[1..1]	Set ID - OBX	**1**
2	2	C	[0..1]	Value Type	**CE** NM = Numeric Results CE = Coded Entry SN = Structured Numeric ST = String Data
3		RE	[1..1]	Observation Identifier	**CLL**
	31				Code: CLL
					Name: empty
4		X		Observation Sub-ID	
5	50	C	[0..1]	Observation Value	**Clinical comment.**
6	20	C	[0..1]	Units	
7		X		References Range	
8		X		Abnormal Flags	
9		X		Probability	
10		X		Nature of Abnormal Test	
11	1	R	[1..1]	Observation Result Status	**F**

SEQ	LEN	OPT	Card.	Element name	Example
12		X		Effective Date of Reference Range	
13		X		User Defined Access Checks	
14	14	R	[0..1]	Date/Time of the Observation	**20160728150751**
15		X		Producer's ID	
16		X		Responsible Observer	
17		X		Observation Method	
18		X		Equipment Instance Identifier	
19		X		Date/Time of the Analysis	
20		X			
21		X			
22		X			
23		X		Performing Organization Name	
24		X		Performing Organization Address	
25		X		Performing Organization Medical Director	

For field 3 and 5, the LIS must only send one type of element at the same time: comment code or free text.

- To apply rules on the clinical comments, send a comment code in field 3 and let field 5 empty.
- To have free comment, send free text in field 5 and let field 3 empty.

Example for clinical information:

Used for rules (with code only)

OBX|1|CE|CLL|||||||F|||20180827160639||||

Used without rules (freetext only)

OBX|1|CE|||Clinical information||||||F|||20180827160639||||

Example for previous value:

ORC|PR|L503111235|L503111235|L503111235|||||20150311110927||||ward01|||||||
hematology^^^^^^^^^ward01<CR>

OBR|1|L503111235|L503111235|WBC^^P8000|||||||BLOOD|||||DR HOUSE|
0033412364566|||||||P<CR>

OBX|1|ST|WBC||35|s|||||F|||20150311121323|||||||<CR>

2.2.9.2. From Yumizen P8000 to LIS

The OBX segment can be used to transmit a result and/or a comment linked to the sample.

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Sement ID	**OBX**
1		R	[1..1]	Set ID - OBX	**1**
2	2	C	[0..1]	Value Type	**NM** NM = Numeric Results CE = Coded Entry SN = Structured Numeric ST = String Data ED = Encapsulated Data
3	31	R	[1..1]	Observation Identifier	**RDW-SD^RDW-SD**
					Code: RDW-SD
					Name: RDW-SD
					ORDER_COMMENT^Request comment
4		X		Observation Sub-ID	
5	50	C	[0..1]	Observation Value	**45.0**
					Delta-Run
					^IM^PNG^Base64^Hexadecimal_Image
6	20	C	[0..1]	Units	**fl**

SEQ	LEN	OPT	Card.	Element name	Example
7		X		References Range	
8		X		Abnormal Flags	
9		X		Probability	
10		X		Nature of Abnormal Test	
11	1	RE	[1..1]	Observation Result Status	**F**
12		X		Effective Date of Reference Range	
13		X		User Defined Access Checks	
14	14	R	[0..1]	Date/Time of the Observation	**20160705100630**
15		X		Producer's ID	
16		X		Responsible Observer	
17		X		Observation Method	
18		C	[0..1]	Equipment Instance Identifier	**Yumizen H2500-SPS**
19		X		Date/Time of the Analysis	
20		X			
21		X			
22		X			
23		X		Performing Organization Name	
24		X		Performing Organization Address	
25		X		Performing Organization Medical Director	

Example of a generic observation/result segment from Yumizen P8000:
OBX|1|NM|RDW-SD^RDW-SD||45.0|fl|||||F|||20160705100630||||Yumizen H2500-SPS

Example of a comment linked to the sample:
OBR|1|34534534589|34534534589|ORDER_COMMENT^Request comment^P8000|||
20191113110805|||||||||||||||||F|||||||<CR>

ORC|SC|34534534589|34534534589|34534534589|A||||20191114114332||||
WardCode|||||||Wardname^^^^^^^^^WardCode<CR>

TQ1|||||||20191114110805||R<CR>

OBX|1|ST|ORDER_COMMENT^Request comment||Delta-Run MPV|||||F|||
20191023144806||||<CR>

Images are also sent using PNG format with base64 encoding.

Code (see OBX.3)	Description
RBC	Red blood cells histogram
PLT	Platelets histogram
BAS%	White blood cells histogram
NEU%	LMNE matrix
PLT-Ox	Optical platelets matrix
BFMN%	Body fluid matrix
BFRBC	Body fluid red blood cells histogram

Example of a BASO curve from Yumizen P8000:
OBX|1|ED|BAS%||
^IM^PNG^Base64^iVBORw0KGgoAAAANSUhEUgAAAQQAAAB2CAIAAACh93ojAAAH
mklEQVR42u2d208UVxyA980H46sPPhjjm0/1T8CYiNwUixcILgi7Ui/
V1jatynJZUcplpVZl1WJLja3bsq7YqnRBI1CsXKUgKJRSbWLUB2LbTTRFJbo9YXDcrrhsl
Zk5u35fJpthmLjMmd/n7/xmzpwx
+QFgHBNNAIAMAMgAgAwAyACADADIAIAMAMgAgAwAyAAgkwwlpWVfHneFucTExIS/
M0uELgaeZfHVzc3Nhslw0Hnk/KWuMBeTyRT+zhaLxRpAQkKC9b+85pbE5SvC/
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oBbN1PbLtT179mgtw9ZtH567eJnwRQapM0NL2xWn06m1DG5PrWP/
YcIXGaSuGerON7pcLq1l+POvv7NyNhG+yCB1Zjj1/Tmv16vDfZb4ZcmELzJIXTMc

+9rV3t6ugwzWdzYTvsggdWaoPHRkaGhIBxk2bN5K
+CKD1DVDSWn5yMiIDjLk23efPHueCEYGeTODLS9/
bGxMBxmOVh87VP0NEYwM8tYMO3Nz9Rmo2HChcVdJBRGMDBJnBluePjIM3/
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9nzTUobrlYPMmUFPGegmIYPUNQMyIAOZARmQgZoBGZCBzGC4DMwMgAzUDBMw
MwAykBnUm9DMDIAM1AzPYGYAZCAzTMDMAMhAzTABMwMgA5IhAmYGQAZqhufEJ
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ZdJh1Olih4RvvbvuYUEaGV5dBi8ygw8sZXuTRo8dr11kJZWR4Hvfi35o/f/
7MmTOrq6vVjXV1dWLjjBkzkpKS7t27p3XNoMPLGV5yQYkRe8gQIENKSsrt27eHhoZmz5
6tbty4cePdu3fFutfrzcnJ0TozdPQO6F9AC9ZzQQkZAmW4f/
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y+Hy
+txYuZloAZJDieYbtO3b6DYUpApBBlsyQa7P5jYYpApBBippBtzeVhlApApBBisyg25tKQs
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rZZGhq74mqzJCba/
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+o9iHDX0IcvhpCBsuQnW3JXJe11mwW/RzxmZqapq4r21NSUtT1mJiYF/
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CQAQAZAJABABkAkAEAGQCQAQAZAJABABkAkAEgevgX4Tpp/u
+X2ikAAAAASUVORK5CYII=|||N|||F|||20170328101027||||702M2SH00019

2.2.10. MSA - Message Acknowledgment Segment

The MSA segment contains information sent while acknowledging another message.

Acknowledgment codes explanation

Value	Description
AA	Application Accept - Enhanced mode: Application acknowledgment: Accept
AE	Application Error - Enhanced mode: Application acknowledgment: Error
AR	Application Reject - Enhanced mode: Application acknowledgment: Reject

2.2.10.1. From LIS to Yumizen P8000

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**MSA**
1	2	R	[1..1]	Acknowledgment Code	**AA**
2		R	[1..1]	Message Control ID	**YP8K20160705100955**
3		X		Text Message	
4		X		Expected Sequence Number	
5		X		Delayed Acknowledgment Type	
6		X		Error Condition	

Example of a message acknowledgment segment from LIS:
MSA|AA|YP8K20160705100955

2.2.10.2. From Yumizen P8000 to LIS

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**MSA**
1	2	R	[1..1]	Acknowledgment Code	**AA**
2		R	[1..1]	Message Control ID	**18698910009**
3		X		Text Message	
4		X		Expected Sequence Number	
5		X		Delayed Acknowledgment Type	
6		X		Error Condition	

Example of a message acknowledgment segment from Yumizen P8000:
MSA|AA|18698910009

2.2.11. SAC - Specimen Container Segment

2.2.11.1. From Yumizen P8000 to Host

The goal of this segment is to inform that the sample is currently in analysis inside the instrument.

To configure this segment, refer to the RAS1117 - Configuring the LIS Connection procedure.

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	SAC
7	14	R		Event date	20170725121422
8		R		Event code [a]	CHECK_IN
		R		Event description [a]	CheckIn / Manual CheckIn
		R		User or device that triggered the event	YH2500-YH2500
10	6	C		Rack number	748565
11	2	C		Position in rack	7

[a]: This field is configurable by user.

Example of an automatic check in:
SAC||||||20220516143527|CHECK_IN^CheckIn^YH2500 - YH2500||748265|7

Example of a manual check in:
SAC||||||20220613103833|CHECK_IN^Manual CheckIn^SUPPORT

2.2.12. Special Characteristics for HORIBA Medical Data

2.2.12.1. Parameters

LOINC Code: Logical Observation Identifiers Names & Codes

CBC Codes	LOINC Code	Definition
RBC	789-8	Red Blood Cells
HGB	718-7	Hemoglobin Concentration
HCT	4544-3	Hematocrit
MCV	787-2	Mean Corpuscular Volume
MCH	785-6	Mean Corpuscular Hemoglobin
MCHC	786-4	Mean Corpuscular Hemoglobin Concentration
RDW-SD	21000-5	Red Distribution Width Standard Deviation

CBC Codes	LOINC Code	Definition
RDW-CV	788-0	Red Distribution Width
MIC	X-MIC	Microcytic Red Blood Cells percentage (versus RBC)
MAC	X-MAC	Macrocytic Red Blood Cells percentage (versus RBC)
PLT	777-3	Platelets
PCT	51637-7	Plateletcrit
PDW	51631-0	Platelets Distribution Width
MPV	32623-1	Mean Platelet Volume
P-LCC	96354-6	Platelets - Large Cell Count
P-LCR	48386-7	Platelets - Large Cell Ratio
WBC	6690-2	White Blood Cells
NRBC#	771-6	Nucleated Red Blood Cells absolute value
NRBC%	58413-6	Nucleated Red Blood Cells percentage
TNC	50774-9	Total Nucleated cells

RBC_PLTO Codes	LOINC Code	Definition
PLT-Ox	97995-5	Platelets from optical channel
LPF	97994-8	Large Platelet Fraction

DIF Codes	LOINC Code	Definition
LYM#	731-0	Lymphocytes absolute value
LYM%	736-9	Lymphocytes percentage
MON#	742-7	Monocytes absolute value
MON%	5905-5	Monocytes percentage
NEU#	751-8	Neutrophils absolute value
NEU%	770-8	Neutrophils percentage
EOS#	711-2	Eosinophils absolute value
EOS%	713-8	Eosinophils percentage
BAS#	704-7	Basophils absolute value
BAS%	706-2	Basophils percentage

DIF Codes	LOINC Code	Definition
IMG#	53115-2	Immature Granulocytic cells absolute value
IMG%	71695-1	Immature Granulocytic cells percentage
IMM#	X-IMM#	Immature Monocytic cells absolute value
IMM%	X-IMM%	Immature Monocytic cells percentage
IML#	X-IML#	Immature Lymphocytic cells absolute value
IML%	X-IML%	Immature Lymphocytic cells percentage
ALY#	43743-4	Atypical Lymphocytes absolute value
ALY%	42250-1	Atypical Lymphocytes percentage
LIC#	55432-9	Large Immature Cells absolute value
LIC%	55433-7	Large Immature Cells percentage

RET Codes	LOINC Code	Definition
RET#	14196-0	Reticulocytes absolute value
RET%	17849-1	Reticulocytes percentage
RET-L	X-RET-L	Reticulocytes with a low RNA content
RET-M	X-RET-M	Reticulocytes with a medium RNA content
RET-H	X-RET-H	Reticulocytes with a high RNA content
CRC	X-CRC	Corrected Reticulocyte Count
MRV	48706-6	Mean Reticulocyte Volume
RHCC	X-RHCC	Reticulocyte Hemoglobin Cellular Content
IRF	X-IRF	Immature Reticulocyte Fraction

Extended DIF Codes	LOINC Code	Definition
Blast#	X-BLAST#	Blasts absolute value
Blast%	X-BLAST%	Blasts percentage
Other#	X-OTHER#	Other cells absolute value
Other%	X-OTHER%	Other cells percentage
Band Cel#	X-BANDNEU#	Bands absolute value
Band Cel%	X-BANDNEU%	Bands percentage
VarLym#	X-VARLYM#	Variant lymphocytes absolute value

Extended DIF Codes	LOINC Code	Definition
VarLym%	X-VARLYM%	Variant lymphocytes percentage
LGLym#	X-LGLYM#	Large granular lymphocytes absolute value
LGLym%	X-LGLYM%	Large granular lymphocytes percentage
Hairy cell#	X-HAIRY#	Hairy cells absolute value
Hairy cell%	X-HAIRY%	Hairy cells percentage
Sezary Cel#	X-SEZARY#	Sezary cells absolute value
Sezary Cel%	X-SEZARY%	Sezary cells percentage
Plasma cell#	X-PLASMA#	Plasma cells absolute value
Plasma cell%	X-PLASMA%	Plasma cells percentage
ProLympho#	X-PROLYM#	Prolymphocytes absolute value
ProLympho%	X-PROLYM%	Prolymphocytes percentage
Promonocyte#	X-PROMON#	Promonocytes absolute value
Promonocyte%	X-PROMON%	Promonocytes percentage
Promyelo#	X-PROMYE#	Promyelocytes absolute value
Promyelo%	X-PROMYE%	Promyelocytes percentage
Myelocyte#	X-MYELO#	Myelocytes absolute value
Myelocyte%	X-MYELO%	Myelocytes percentage
Metamyelo#	X-METAMYE#	Metamyelocytes absolute value
Metamyelo%	X-METAMYE%	Metamyelocytes percentage
IMMEos#	X-IMEOS#	Immature eosinophils absolute value
IMMEos%	X-IMEOS%	Immature eosinophils percentage
IMMBas#	X-IMBAS#	Immature basophils absolute value
IMMBas%	X-IMBAS%	Immature basophils percentage
TAG	-	Thrombocyte aggregates
GT	-	Giant thrombocytes
SMU	-	Smudge cells
Artefact	-	Artefact
Not Classed%	-	Not classed

CBF Codes	LOINC Code	Definition
BFRBC	X-BFRBC	Red Blood Cells absolute value
BFWBC	X-BFWBC	White Blood Cells absolute value
BFMN#	X-BFMN#	Mononuclear absolute value
BFMN%	X-BFMN%	Mononuclear percentage
BFPN#	X-BFPN#	Polymorphonuclear absolute value
BFPN%	X-BFPN%	Polymorphonuclear percentage
BFOther%	X-BFOTHER#	Other BF percentage
BFOther#	X-BFOTHER%	Other BF absolute value

ESR Codes	LOINC Code	Definition
ESR	82477-1	Erythrocyte Sedimentation Rate

2.2.12.2. Suspected Pathologies

Suspected pathologies are transmitted through one Comment record located after the corresponding Result record. If several pathologies are suspected, they are transmitted through several NTE frames.

Refer to NTE - Notes and Comments Segment.

Here is the full list of comments:

Full comments list

Here are the new comments added in this version:

New comments list

2.3. Laboratory Testing Workflow Examples

2.3.1. LIS to Yumizen P8000 standard test request

<VT>

MSH|^~\&|LIS|LIS|YP8K|YP8K|20160416090430||OML^O33^OML_O33|18698910009|P|2.5|||||| <CR>

PID|||P0002^^^LIS^PI||DOE^JOHN^^||19601206|M|||Main Street^^Springfield^NY^65466^USA^ATC1||0033412364567|||||ABC123^^LIS||||||||||||N|AL<CR>

PV1||N||||||||||||||||||||||||||||||||||||||||||||20160416090430|20160416090430<CR>

SPM|1|201604163002||BLOOD||||MAIN LAB||||||||201604160904|201604160904|||||<CR>

ORC|NW|L604163002|L604163002|L604163002|||||20160416090430|||ward01|||||||| hematology^^^^^^^^^ward01<CR>

TQ1||||||20160416090430||S<CR>

OBR|1|L604163002|L604163002|CBC^CBC profile^YP8K|||||||||||DR HOUSE|||||||P<CR>

OBX|1|CE|CLL||Clinical comment.||||||F|||20160728150751||<CR>

ORC|NW|L604163002|L604163002|L604163002|||||20160416090430|||ward01|||||||| hematology^^^^^^^^^ward01<CR>

TQ1||||||20160416090430||S<CR>

OBR|1|L604163002|L604163002|DIF^DIF profile^YP8K|||||||||||DR HOUSE|||||||P<CR>

<FS>

<CR>

2.3.2. LIS to Yumizen P8000 standard test request with previous results

<VT>

MSH|^~\&|LIS|LIS|YP8K|YP8K|20160416090430||OML^O33^OML_O33|18698910009|P|2.5|||||| <CR>

PID|||P0002^^^LIS^PI||DOE^JOHN^^||19601206|M|||Main Street^^Springfield^NY^65466^USA^ATC1||0033412364567|||||ABC123^^LIS||||||||||||N|AL<CR>

PV1||N||||||||||||||||||||||||||||||||||||||||||||20160416090430|20160416090430<CR>

SPM|1|201604163002||BLOOD||||MAIN LAB||||||||201604160904|201604160904|||||<CR>

ORC|NW|L604163002|L604163002|L604163002|||||20160416090430|||ward01|||||||| hematology^^^^^^^^^ward01<CR>

TQ1||||||20160416090430||S<CR>

OBR|1|L604163002|L604163002|CBC^CBC profile^YP8K|||||||BLOOD|||||DR HOUSE|||||||P<CR>

OBX|1|CE|CLL||Clinical comment.||||||F|||20160728150751||<CR>

ORC|NW|L604163002|L604163002|L604163002|||||20160416090430|||ward01|||||||| hematology^^^^^^^^^ward01<CR>

TQ1||||||20160416090430||S<CR>

OBR|1|L604163002|L604163002|DIF^DIF profile^YP8K|||||||||||DR HOUSE|||||||P<CR>

PV1||N||||||||||||||||||||||||||||||||||||||||||||20150131110927|20150131110927<CR>

ORC|PR|L503111235|L503111235|L503111235|||||20150311110927|||ward01|||||||| hematology^^^^^^^^^ward01<CR>

OBR|1|L503111235|L503111235|WBC^^P8000|||||||BLOOD|||||DR HOUSE|0033412364566|||||||P<CR>

OBX|1|ST|WBC||35|s|||||F|||20150311121323|||||||<CR>

<FS>

<CR>

2.3.3. Yumizen P8000 to LIS acknowledgment

<VT>

MSH|^~\&|YP8K|^^|^^|^^|20160705095243||ORL^O34^ORL_O34|YP8K20160705095243|P|2.5|||||| <CR>

MSA|AA|18698910009

2.3.4. Yumizen P8000 to LIS standard result

<VT>

MSH|^~\&|YP8K||LIS||20220330094150||OUL^R22^OUL_R22|18344563693096|P|2.5<CR>

PID|||0002^^^LIS^PI||PATIENT 2^TEST^^^^^|^^^^^^|19260607|F|||Main Street^^Springfield^NY^65466^USA^ATC1||||||ABC123||||||||||Y<CR>

PV1||N|WARD00002^^||||ATD^|||||||||ADD^||ABC123|||||||||||||||||||||||20220330114144|20220330114144<CR>

SPM|1|202203300002||BLOOD||||MAIN LAB<CR>

OBR|1|2203300002|2203300002|^Commentaire de la demande^HALIA|||20220330113916||||||||||||||||F<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330054620||||W00002|||||||WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|ST|ORDER_COMMENT^Commentaire de la demande||Woman: >21|||||F|||20220330054620<CR>

OBR|2|2203300002|2203300002|PCT^PCT^HALIA|||20220330113916||||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|PCT^PCT||0.179|%|0.15 - 0.4||||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

OBR|3|2203300002|2203300002|IMG%^IMG%^HALIA|||20220330113916||||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|IMG%^IMG%||0.1|%|0.0 - 2.0||||F|||20220330114559||||H2500ID<CR>

OBR|4|2203300002|2203300002|MCV^MCV^HALIA|||20220330113916||||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MCV^MCV||104.1|fL|78.0 - 100.0|H|||F|||20220330152729||||H2500ID<CR>

OBR|5|2203300002|2203300002|NEU#^NEU#^HALIA|||20220330113916||||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|NEU#^NEU#||2.34|1E09/L|1.5 - 7.0||||F|||20220330114559||||H2500ID<CR>

OBR|6|2203300002|2203300002|P-LCR^P-LCR^HALIA|||20220330113916||||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|P-LCR^P-LCR||49.4|%|18.0 - 50.0||||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

OBR|7|2203300002|2203300002|IMG#^IMG#^HALIA|||20220330113916||||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|IMG#^IMG#||0.00|1E09/L|0.0 - 999.9||||F|||20220330114559||||H2500ID<CR>

OBR|8|2203300002|2203300002|LPF^LPF^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|LPF^LPF||7.3|%|0.0 - 99.9||||F|||20220330152729||||H2500ID<CR>

OBR|9|2203300002|2203300002|NEU%^NEU%^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|NEU%^NEU%||50.9|%|40.0 - 75.0||||F|||20220330114559||||H2500ID<CR>

OBR|10|2203300002|2203300002|PLT-Ox^PLT-Ox^HALIA|||20220330113916|||||||||||||||
F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|PLT-Ox^PLT-Ox||131|1E09/L|150.0 - 400.0|L|||F|||20220330152729||||
H2500ID<CR>

NTE|1||Heterogeneous run<CR>

OBR|11|2203300002|2203300002|RDW-CV^RDW-CV^HALIA|||
20220330113916|||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|RDW-CV^RDW-CV||15.8|%|12.0 - 18.0||||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

OBR|12|2203300002|2203300002|TNC^TNC^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|TNC^TNC||4.59|1E09/L|3.5 - 10.0||||F|||20220330114559||||H2500ID<CR>

OBR|13|2203300002|2203300002|ALY%^ALY%^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|ALY%^ALY%||0.5|%|0.0 - 2.5||||F|||20220330114559||||H2500ID<CR>

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SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

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OBR|15|2203300002|2203300002|NRBC#^NRBC#^HALIA|||20220330113916|||||||||||||||
F|||||||SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|NRBC#^NRBC#||0.00|1E09/L|0.0 - 0.15||||F|||20220330114559||||
H2500ID<CR>

OBR|16|2203300002|2203300002|MPV^MPV^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MPV^MPV||11.8|fL|7.4 - 12.0||||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

OBR|17|2203300002|2203300002|RBC^RBC^HALIA|||20220330113916||||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|RBC^RBC||4.22|1E12/L|3.8 - 5.8||||F|||20220330152729||||H2500ID<CR>

OBR|18|2203300002|2203300002|P-LCC^P-LCC^HALIA|||20220330113916||||||||||||||||
F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|P-LCC^P-LCC||75|1E09/L|44.0 - 140.0||||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

OBR|19|2203300002|2203300002|MON#^MON#^HALIA|||20220330113916||||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MON#^MON#||0.41|1E09/L|0.2 - 0.8||||F|||20220330114559||||H2500ID<CR>

OBR|20|2203300002|2203300002|PLT^PLT^HALIA|||20220330113916||||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|PLT^PLT||152|1E09/L|150.0 - 400.0||||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

NTE|2||SLIDE: Schistocytes suspicion optical PLT<CR>

NTE|3||Large Platelets suspicion<CR>

NTE|4||PLT abn. histogram - Large PLT?<CR>

NTE|5||PLTO abn. matrix - Schistocyte?<CR>

OBR|21|2203300002|2203300002|IML#^IML#^HALIA|||20220330113916||||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|IML#^IML#||0.00|1E09/L|0.0 - 0.05||||F|||20220330114559||||H2500ID<CR>

OBR|22|2203300002|2203300002|WBC^WBC^HALIA|||20220330113916||||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|WBC^WBC||4.59|1E09/L|3.5 - 10.0||||F|||20220330114559||||H2500ID<CR>

OBR|23|2203300002|2203300002|LIC%^LIC%^HALIA|||20220330113916||||||||||||||||F|||||||
SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|LIC%^LIC%||0.1|%|0.0 - 3.0||||F|||20220330114559||||H2500ID<CR>

OBR|24|2203300002|2203300002|MON%^MON%^HALIA|||20220330113916||||||||||||||||
F|||||||SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MON%^MON%||8.8|%|4.0 - 13.0||||F|||20220330114559||||H2500ID<CR>

OBR|25|2203300002|2203300002|LIC#^LIC#^HALIA|||20220330113916||||||||||||||||F|||||||
SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|LIC#^LIC#||0.00|1E09/L|0.0 - 0.2||||F|||20220330114559||||H2500ID<CR>

OBR|26|2203300002|2203300002|IML%^IML%^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|IML%^IML%||0.0|%|0.0 - 0.2||||F|||20220330114559||||H2500ID<CR>

OBR|27|2203300002|2203300002|LYM#^LYM#^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|LYM#^LYM#||1.73|1E09/L|1.0 - 4.0||||F|||20220330114559||||H2500ID<CR>

OBR|28|2203300002|2203300002|HGB^HGB^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|HGB^HGB||156|g/L|120.0 - 160.0||||F|||20220330152729||||H2500ID<CR>

OBR|29|2203300002|2203300002|PDW^PDW^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|PDW^PDW||24.6|fL|11.0 - 20.0|H~HH|||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

OBR|30|2203300002|2203300002|SLIDE^SLIDE^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|ST|SLIDE^SLIDE||SLIDE_EJECTED|-|||||F|||20220330152740||||H2500ID<CR>

NTE|1||Slide Count Expected<CR>

OBR|31|2203300002|2203300002|MIC^MIC^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MIC^MIC||0.7|%|0.0 - 20.0||||F|||20220330152729||||H2500ID<CR>

OBR|32|2203300002|2203300002|LYM%^LYM%^HALIA|||20220330113916|||||||||||||||
F|||||||SUPPORT<CR>

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WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|LYM%^LYM%||37.8|%|15.0 - 45.0||||F|||20220330114559||||H2500ID<CR>

OBR|33|2203300002|2203300002|RDW-SD^RDW-SD^HALIA|||
20220330113916|||||||||||||||F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|RDW-SD^RDW-SD||49.0|fL|37.0 - 56.0||||F|||20220330152729||||H2500ID<CR>

NTE|1||*<CR>

NTE|2||RBC abn. histogram - Abnormal distribution<CR>

OBR|34|2203300002|2203300002|MAC^MAC^HALIA|||20220330113916|||||||||||||||F|||||||
SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MAC^MAC||6.8|%|2.0 - 10.0||||F|||20220330152729||||H2500ID<CR>

OBR|35|2203300002|2203300002|BAS%^BAS%^HALIA|||20220330113916|||||||||||||||
F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|BAS%^BAS%||1.2|%|0.0 - 2.0||||F|||20220330114559||||H2500ID<CR>

OBR|36|2203300002|2203300002|BAS#^BAS#^HALIA|||20220330113916|||||||||||||||||F||||||| SUPPORT<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|NM|BAS#^BAS#||0.05|1E09/L|0.0 - 0.2||||F|||20220330114559||||H2500ID<CR>

OBR|37|2203300002|2203300002|NRBC%^NRBC%^HALIA|||20220330113916|||||||||||||||| F|||||||SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002||||||| WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|NRBC%^NRBC%||0.0|%|0.0 - 2.0||||F|||20220330114559||||H2500ID<CR>

OBR|38|2203300002|2203300002|MCH^MCH^HALIA|||20220330113916|||||||||||||||F||||||| SUPPORT<CR>

ORC|SC|2203300002|2203300002|2203300002|A||||20220330094130||||W00002||||||| WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MCH^MCH||37.1|pg|25.0 - 32.0|H~HH|||F|||20220330152729||||H2500ID<CR>

OBR|39|2203300002|2203300002|MCHC^MCHC^HALIA|||20220330113916|||||||||||||||| F|||||||SUPPORT<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|NM|MCHC^MCHC||356|g/L|320.0 - 350.0|H|||F|||20220330152729||||H2500ID<CR>

OBR|40|2203300002|2203300002|HCT^HCT^HALIA|||20220330113916|||||||||||||||F||||||| SUPPORT<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|NM|HCT^HCT||0.439|L/L|0.36 - 0.48||||F|||20220330152729||||H2500ID<CR>

OBR|41|2203300002|2203300002|IMM#^IMM#^HALIA|||20220330113916|||||||||||||||F||||||| SUPPORT<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|NM|IMM#^IMM#||0.00|1E09/L|0.0 - 0.1||||F|||20220330114559||||H2500ID<CR>

OBR|42|2203300002|2203300002|EOS#^EOS#^HALIA|||20220330113916|||||||||||||||F||||||| SUPPORT<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|NM|EOS#^EOS#||0.06|1E09/L|0.0 - 0.5||||F|||20220330114559||||H2500ID<CR>

OBR|43|2203300002|2203300002|EOS%^EOS%^HALIA|||20220330113916|||||||||||||||| F|||||||SUPPORT<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|NM|EOS%^EOS%||1.3|%|0.5 - 7.0||||F|||20220330114559||||H2500ID<CR>

OBR|44|2203300002|2203300002|IMM%^IMM%^HALIA|||20220330113916|||||||||||||||| F|||||||SUPPORT<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|NM|IMM%^IMM%||0.0|%|0.0 - 0.5||||F|||20220330114559||||H2500ID<CR>

OBR|45|2203300002|2203300002|^BAS%^HALIA|||20220330113916|||||||||||||||F<CR>

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TQ1|||||||20220330113916||R<CR>

OBX|1|ED|BAS%^BAS%||
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OBR|49|2203300002|2203300002|^PLT-Ox^HALIA|||20220330113916|||||||||||||||||F<CR>

ORC|SC|2203300002|2203300002|2203300002|A|||||||W00002|||||||
WARD00002^^^^^^^^^W00002<CR>

TQ1|||||||20220330113916||R<CR>

OBX|1|ED|PLT-Ox^PLT-Ox||
^IM^PNG^Base64^iVBORw0KGgoAAAANSUhEUgAAAQAAAAEACAIAAADTED8xAAAS
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q4Nv1Osbjr8GfU1BFPsw+zFP/9p8ZgNg/PU//WDc4OJPcg/A9dfH02o+QItdn2/9kCdp/
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<FS>

<CR>

2.3.5. LIS to Yumizen P8000 acknowledgment

<VT>
MSH|^~\&|^|^|YP8K|^|20170626173511||ACK|83990442966255|P|2.5||||||<CR>
MSA|AA|83990442966255<CR>
<FS>
<CR>

2.3.6. Automatic and Manual Check-in Examples

Automatic check-in

MSH|^~\&|YP8K||LIS||20220516143539||OUL^R22^OUL_R22|274846414128113|P|2.5<CR>

PID|1||00000001^^^^PI||PATIENT 1^TEST||19740705000000|M<CR>

SPM|1|2022051300000101^2022051300000101||BLOOD||||MAIN

LAB||||||||20220513135352<CR>

SAC|||||||20220516143527|CHECK_IN^Automatic CheckIn^YH2500 - YH2500||748265|7<CR>

OBR|1|1151||2022051300000101<CR>

ORC|SC|1151||22051300000101|||||20220513135352<CR>

Manual check-in

MSH|^~\&|YP8K||LIS||20220613103837||OUL^R22^OUL_R22|1641198913631860|P|2.5<CR>

PID|1||00000011^^^^PI||PATIENT 11^TEST||19831211000000|M<CR>

SPM|1|2022060700000011^2022060700000011||BLOOD||||MAIN

LAB||||||||20220607094433<CR>

SAC|||||||20220613103833|CHECK_IN^Manual CheckIn^SUPPORT<CR>

OBR|1|1381||2022060700000011<CR>

ORC|SC|1381||22060700000011|||||20220607094433||||||||||1<CR>

2.4. Patient Detailed Structure

MSH - Message Header Segment	Segment ID .SEQ	Field name	Example
MSH|^~\&|YP8K||LIS|| 20210413112501|| ORU^R01| 1873659553185571|Q| 2.5<CR>	MSH .0	Segment ID	MSH
	MSH .1	Field Separator	|
	MSH .2	Encoding characters	^~\&
	MSH .3	Sending Application	YP8K
	MSH .5	Receiving Application	LIS
	MSH .7	Date/Time of message	20220408121010
	MSH .10	Message Control ID	1317701668710
	MSH .11	Processing ID	P

PID - Patient Identification Segment	Segment ID .SEQ	Field name	Example
PID|||0002^^^LIS^PI|| PATIENT 2^TEST^^^^^|^^^^^^| 19830421|F|||Main Street^^Springfield^N Y^65466^USA^ATC1|||| |||ABC123|||||||||||Y<CR>	PID .0	Segment ID	PID
	PID .3	Patient Identifier List	0002^^^LIS^PI
	PID .5	Patient Name	PATIENT 2^TEST^^^^^
	PID .7	Date/Time of Birth	19830421
	PID .8	Administrative Sex	F
	PID .11	Patient Address	Main Street^^Springfield^N Y^65466^USA^ATC1
	PID .18	Patient Account Number	ABC123
	PID .31	Identity Unknown Indicator	Y

PV1 - Patient Visit Segment	Segment ID .SEQ	Field name	Example
SPM|1|202204081014|| BLOOD||||MAIN LAB<CR>	PV1 .0	Segment ID	PV1
	PV1 .2	Patient Class	N
	PV1 .3	Assigned Patient Location	WARD00004^^
	PV1 .7	Attending Doctor	ATD^
	PV1 .17	Admitting Doctor	ADD^
	PV1 .19	Visit Number	ABC123
	PV1 .44	Admit Date/Time	20220408115540
	PV1 .45	Discharge Date/Time	20220408115540

SPM - Specimen Segment	Segment ID .SEQ	Field name	Example
SPM|1|202204081014|| BLOOD||||MAIN LAB<CR>	SPM .0	Segment ID	SPM
	SPM .1	Set ID - SPM	1
	SPM .2	Sample ID	202204081014
	SPM .4	Specimen Type	BLOOD
	SPM .8	Specimen Source Site	MAIN LAB

The next 4 segments (OBR, ORC, TQ1, OBX) is a group linked to the comment of the sample order.

Data linked to the result of parameters are given in the following groups.

Data type is differentiated by OBX Value Type (OBX .2), ST stands for String Data.

OBR - Observation Request Segment	Segment ID .SEQ	Field name	Example
OBR|1|2204081014| 2204081014| ORDER_COMMENT^R equestcomment^HALI A||| 20220408115540|||||||||| |||||F<CR>	OBR .0	Segment ID	OBR
	OBR .1	Set ID - OBR	1
	OBR .2	Placer Order Number	2204081014
	OBR .3	Filler Order Number	2204081014
	OBR .4	Universal Service Identifier	ORDER_COMMENT^R equestcomment^HALI A
	OBR .7	Observation Date/Time	20220408115540
	OBR .25	Results Status	F

ORC - Common Order Segment	Segment ID .SEQ	Field name	Example
ORC|SC|2204081014| 2204081014| 2204081014|A|||| 20220408121004|||| W00004|||||||| WARD00004^^^^^^^^ ^W00004<CR>	ORC .0	Segment ID	ORC
	ORC .1	Order Control	SC
	ORC .2	Placer Order Number	2204081014
	ORC .3	Filler Order Number	2204081014
	ORC .4	Placer Group Number	2204081014
	ORC .5	Order Status	A
	ORC .9	Date/Time of Transaction	20220408121004
	ORC .13	Enterer's Location (Ward name)	W00004
	ORC .21	Ordering Facility Name (Ward ID^^^^^^^^^Wardname)	WARD00004^^^^^^^^ ^W00004

TQ1 - Time/Quantity Segment	Segment ID .SEQ	Field name	Example
TQ1||||||| 20220408115540|| R<CR>	TQ1 .0	Segment ID	TQ1
	TQ1 .7	Start date/time	20220408115540
	TQ1 .9	Priority	R

OBX - Observation Result Segment	Segment ID .SEQ	Field name	Example
OBX|1|ST| ORDER_COMMENT^Commentaire de la demande||Woman: >21||||||F||| 20220408121004<CR>	OBX .0	Segment ID	OBX
	OBX .1	Set ID - OBX	1
	OBX .2	Value Type	ST
	OBX .3	Observation Identifier	ORDER_COMMENT^Commentaire de la demande
	OBX .5	Observation Value	Woman: >21
	OBX .11	Observation Result Status	F
	OBX .14	Date/Time of the observation	20220408121004

Next 4 segments (OBR, ORC, TQ1, OBX) is a group linked to the result of one parameter - 'n' groups (= "n" parameters) are sent all containing OBR, ORC, TQ1, OBX segments.

OBR set ID (OBR.1) is incremented at each parameter.

Data type is differentiated by OBX Value Type (OBX .2) - NM stands for Numeric Results.

OBR - Observation Request Segment	Segment ID .SEQ	Field name	Example
OBR|2|2204081014| 2204081014| MCV^MCV^HALIA||| 20220408115540||||||||||| ||||||F|||||||ruleResult<CR>	OBR .0	Segment ID	OBR
	OBR .1	Set ID - OBR	2
	OBR .2	Placer Order Number	2204081014
	OBR .3	Filler Order Number	2204081014
	OBR .4	Universal Service Identifier	MCV^MCV^HALIA
	OBR .7	Observation Date/Time	20220408115540
	OBR .25	Results Status	F
	OBR .32	Principal Results Interpreter	ruleResult

ORC - Common Order Segment	Segment ID .SEQ	Field name	Example
ORC|SC|2204081014| 2204081014| 2204081014|A|||| 20220408121004|||| W00004||||||| WARD00004^^^^^^^^ ^W00004<CR>	ORC .0	Segment ID	ORC
	ORC .1	Order Control	SC
	ORC .2	Placer Order Number	2204081014
	ORC .3	Filler Order Number	2204081014
	ORC .4	Placer Group Number	2204081014
	ORC .5	Order Status	A
	ORC .9	Date/Time of Transaction	20220408121004
	ORC .13	Enterer's Location (Ward name)	W00004
	ORC .21	Ordering Facility Name (Ward ID^^^^^^^^^Wardname)	WARD00004^^^^^^^^ ^W00004

TQ1 - Time/Quantity Segment	Segment ID .SEQ	Field name	Example
TQ1||||||| 20220408115540|| R<CR>	TQ1 .0	Segment ID	TQ1
	TQ1 .7	Start date/time	20220408115540
	TQ1 .9	Priority	R

OBX - Observation Result Segment	Segment ID .SEQ	Field name	Example
OBX|1|NM|MCV^MCV|| 101.8|fL|75.0 - 97.0|H||| F|||20220408120943|||| YH1500 - YH2500<CR>	OBX .0	Segment ID	OBX
	OBX .1	Set ID - OBX	1
	OBX .2	Value Type	NM
	OBX .3	Observation Identifier	MCV^MCV
	OBX .5	Observation Value	101.8
	OBX .6	Units	fL
	OBX .7	References range	75.0 - 97.0
	OBX .8	Abnormal Flags	H
	OBX .11	Observation Result Status	F
	OBX .14	Date/Time of the observation	20220408120943
	OBX .18	Equipment Instance Identifier	YH1500 - YH2500

Next 4 segments (OBR, ORC, TQ1, OBX) is a group linked to the result of 1 kind of graphic (LMNE,RET, etc) - 'n' groups (=n graphics) are sent all containing OBR, ORC, TQ1, OBX segments.

OBR set ID (OBR.2) is incremented at each graph.

Data type is differentiated by OBX Value Type (OBX .2) - ED stands for Encapsulated Data

OBR - Observation Request Segment	Segment ID .SEQ	Field name	Example
OBR|52|2204081014| 2204081014|^RET %^HALIA||| 20220408115540|||||||||| ||||||F<CR>	OBR .0	Segment ID	OBR
	OBR .1	Set ID - OBR	52
	OBR .2	Placer Order Number	2204081014
	OBR .3	Filler Order Number	2204081014
	OBR .4	Universal Service Identifier	^RET%^HALIA
	OBR .7	Observation Date/Time	20220408115540
	OBR .25	Results Status	F

ORC - Common Order Segment	Segment ID .SEQ	Field name	Example
ORC|SC|2204081014| 2204081014| 2204081014|A||||||| W00004||||||| WARD00004^^^^^^^^ ^W00004<CR>	ORC .0	Segment ID	ORC
	ORC .1	Order Control	SC
	ORC .2	Placer Order Number	2204081014
	ORC .3	Filler Order Number	2204081014
	ORC .4	Placer Group Number	2204081014
	ORC .5	Order Status	A
	ORC .13	Enterer's Location (Ward name)	W00004
	ORC .21	Ordering Facility Name (Ward ID^^^^^^^^^Wardname)	WARD00004^^^^^^^^ ^W00004

TQ1 - Time/Quantity Segment	Segment ID .SEQ	Field name	Example
TQ1||||||| 20220408115540|| R<CR>	TQ1 .0	Segment ID	TQ1
	TQ1 .7	Start date/time	20220408115540
	TQ1 .9	Priority	R

OBX - Observation Result Segment	Segment ID .SEQ	Field name	Example
OBX|1|ED|RET%^RET %|| ^IM^PNG^Base64^iVB ORw0KGgoAAAANSUh EUgAAAQAAAAEACAI AAADTED8xAAAHbElE QVR42u3dO3LcRhRAU a3EsWOtyWtQpCptxYt w5NShdzSRKdFFjQaN 1w +NbnwP6gYUSY3m0w dofGb06VPT8nh87xrLl 6/...|||N|||F||| 20220408120949|||| YH1500 - YH2500<CR>[a]	OBX .0	Segment ID	OBX
	OBX .1	Set ID - OBX	1
	OBX .2	Value Type	ED
	OBX .3	Observation Identifier	RET%^RET%
	OBX .5	Observation Value	^IM^PNG^Base64^iVB ORw0KGgoAAAANSUh EUgAAAQAAAAEACAI AAADTED8xAAAHbElE QVR42u3dO3LcRhRAU a3EsWOtyWtQpCptxYt w5NShdzSRKdFFjQaN 1w +NbnwP6gYUSY3m0w dofGb06VPT8nh87xrLl 6/...
	OBX .8	Abnormal Flags	N
	OBX .11	Observation Result Status	F
	OBX .14	Date/Time of the Observation	20220408120949
	OBX .18	Equipment Instance Identifier	YH1500 - YH2500

[a]: This example is not exhaustive as there are too many characters to display.

2.5. Minimal Lower Layer Protocol

This section describes a minimal HL7 lower level protocol to be used in a pure network environment. It is an adaptation of the hybrid lower layer protocol. It is assumed that this HL7 protocol is used only in a network environment. Most of the details of error detection and correction are handled by the lower levels of any reasonable network protocol and do not require any supplementation.

The goal of this lower level protocol (LLP) is to provide an interface between HL7 and the network that uses minimal overhead while remaining compatible with other LLPs.

Other types of links, such as RS-232 to a communication server, require another protocol to guarantee their integrity. This version of the lower LLP differs significantly from other lower level protocols in that it has only a single byte to signal the start of a message and two bytes to signal the end of a message. There is no other lower level header or trailer information. There are no other characters added to the HL7 message.

Notation conventions:

1. Single ASCII characters are enclosed in single quotes.
2. Special characters or non-printing ASCII characters are enclosed in angle brackets, <>.

Special characters are the LLP Start Block and End Block characters.

Non-printing ASCII characters may be written as their abbreviation, e.g., ESC for the Escape character. They also may be written as their hex value in the form 0xXX where X is a hexadecimal digit.

For example in Standard ASCII, <ESC> is <0x1B>.

BLOCK FORMAT

HL7 messages are enclosed by special characters to form a block. The format is as follows:

<SB>dddd<EB><CR>

<SB>

Start Block character (1 byte)

ASCII <VT>, i.e., <0x0B>.

This should not be confused with the ASCII characters SOH or STX.

dddd

Data (variable number of bytes)

This is the HL7 data content of the block.

The data can contain any displayable ASCII characters and the carriage return character, <CR>.

<EB>

End Block character (1 byte)

ASCII <FS>, i.e., <0x1C>.

This should not be confused with the ASCII characters ETX or EOT.

<CR>

Carriage Return (1 byte)

The ASCII carriage return character, i.e., <0x0D>.

2.6. References

Title	Version	Date	Author
HL7 Messaging Standard	2.5	2013	HL7 Int.
IHE Laboratory (LAB) Technical Framework	5.0	2013	IHE Int.
IHE IT Infrastructure (ITI) Technical Framework	10.1	2013	IHE Int.

3. QC to LIS

3.1. Overview

The YumizenLis driver can send QC results on the same channel as patient results among which:

- QC sample ID
- QC LIS test code
- QC result value
- QC result date and time
- QC result units
- QC result device/instrument ID

Detailed information is sent to LIS, such as:

- Comments
- Target values
- Deviations
- Violated rules
- Laboratory's technician user ID validator

By default, all those information is sent.
A detailed structure is available, refer to the *QC to LIS - Detailed Structure* chapter.
To deactivate this function, refer to the technical manual.

Message structure

The following table lists the detailed structure for QC message from Yumizen P8000 to the LIS:

Segment	Meaning	Usage	Card.
MSH	Message Header	R	[1..1]
OBR	Observation Order	R	[1..1]
OBX .1	Observation Result (first parameter)	R	[1..n]
OBX .2	Observation Result (second parameter)	R	[1..n]
OBX .n	Observation Result (n parameter)	R	[1..n]
FS	File Separator	R	[1..1]
CR	Carriage return	R	[1..1]

QC can be resent to LIS.
In case of resending, only controlled parameters are resent to LIS.

3.2. LIS to Yumizen P8000 ACK / NAK

The reply expected from the LIS in response to a QC result message is the standard HL7.

The reply must be sent by the LIS on the same channel used by the Yumizen P8000 to send QC result messages (standard results channels).
The LIS can accept or refuse the QC result message. This data is saved on the Yumizen P8000 so that the QC result will no longer be sent to the LIS.

Message structure

The following table lists the ACK structure for a message from the LIS to the Yumizen P8000:

Segment	Meaning	Usage	Card.
MSH	Message Header	R	[1..1]
MSA	Message Acknowledgment	R	[1..1]
[ERR]	Error	R	[0..1]
FS	File Separator	R	[1..1]
CR	Carriage return	R	[1..1]

Example of a reply from the LIS:
MSH|^~\&|^|^|YP8K|^|20170626173511||ACK|1873659553185571|P|2.5|||||<CR>

MSA|AA|1873659553185571<CR>

<FS>

<CR>

3.3. MSH - Message Header Segment

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R	[1..1]	Segment ID	**MSH**
1	1	R	[1..1]	Field Separator	**|** (Pipe)
2	4	R	[1..1]	Encoding characters	**^~\&**
					^: sub field delimiter
					~: repeat sub field delimiter
					\: ESCAPE sequence
					&: sub filed component delimiter
3	20	R	[1..1]	Sending Application	**YP8K**
					NameSpace ID: YP8K
4		R	[1..1]	Sending Facility	NameSpace ID: Empty
5		R	[1..1]	Receiving Application	**LIS**
					NameSpace ID: Empty
6	14	R	[1..1]	Receiving Facility	NameSpace ID: Empty
7		R	[1..1]	Date/Time of message	**20210413112501**
8		X		Security	
9		R	[1..1]	Message Type	**ORU^R01**
					Message code ID: ORU
					Trigger event ID: R01
					Message structure ID: ORU_R01
10		R	[1..1]	Message Control ID	**1873659553185570**
11	1	R		Processing ID	**Q**
12		R		Version ID	**2.5**

Example of a QC message sent to the LIS:
MSH|^~\&|YP8K||LIS||20210413112501||ORU^R01|1873659553185571|Q|2.5

3.4. OBR - Observation Request Segment

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**OBR**
1	1	R	[0..1]	Set ID - OBR	**1**

SEQ	LEN	OPT	Card.	Element name	Example
2		RE	[0..1]	Placer Order Number	
3	9	R	[1..1]	Filler Order Number	**PX416H**
4		R	[1..1]	Universal Service Identifier	**QC**
5		X		Priority	
6		X		Requested Date/Time	
7		X		Observation Date/Time	
8	14	R		Observation End Date/Time	**20210413112453**
9		X		Collection Volume	
10		X		Collector Identifier	
11		X		Specimen Action Code	
12		X		Danger Code	
13		X		Relevant Clinical Information	
14		X		Specimen Received Date/ Time	
15		R	[1..1]	Specimen Source	**^^^^^^Q**

Example of a QC message sent to the LIS:
OBR|1||PX416H|QC||||20210413112453|||||||^^^^^^Q

OBR .3 field: description of control sample tube as follows:

1. Two or three letters for the QC control type: PX (ABX Difftrol), RX (ABX Minotrol Retic), BFI (BFTROL), SX (ESRtrol).
2. A series of numbers for the QC lot number.
3. The last characters give the QC level: L or -1 (Low), N or -2 (Medium), H or -3 (High).

Examples:

OBR .3	Control Type	Lot Number	Level	Description
PX114L	ABX Difftrol	114	Low	ABX Difftrol 114 level Low.
PX114N	ABX Difftrol	114	Normal	ABX Difftrol 114 level Normal
PX114H	ABX Difftrol	114	High	ABX Difftrol 114 level High
RX115-1	ABX Minotrol Retic	115	Low	ABX Minotrol Retic 115 level Low
RX115-2	ABX Minotrol Retic	115	Normal	ABX Minotrol Retic 115 level Normal
RX115-3	ABX Minotrol Retic	115	High	ABX Minotrol Retic 115 level High
BFI0095-2	BFTROL	0095	Normal	BFTROL 0095 level Normal
BFI0095-3	BFTROL	0095	High	BFTROL 0095 level High
SX123N	ESRtrol	123	Normal	ESRtrol 123 level Normal
SX123H	ESRtrol	123	High	ESRtrol 123 level High

3.5. OBX - Observation Result Segment

SEQ	LEN	OPT	Card.	Element name	Example
0	3	R		Segment ID	**OBX**
1	1	R	[1..1]	Set ID - OBX	**2**
2	2	C	[0..1]	Value Type	**NM**
3		R	[1..1]	Observation Identifier	**HGB**
4		X		Observation Sub-ID	
5		C	[0..1]	Observation Value	**165.2001**
6		C	[0..1]	Units	**g/L**

SEQ	LEN	OPT	Card.	Element name	Example
7		X		References Range	
8		X		Abnormal Flags	
9		X		Probability	
10		X		Nature of Abnormal Test	
11	1	RE	[1..1]	Observation Result Status	**F**
12		X		Effective Date of Reference Range	
13		X		User Defined Access Checks	
14	14	RE	[0..1]	Date/Time of the Observation	**20210413104907**
15		X		Producer's ID	
16		X		Responsible Observer	
17		X		Observation Method	
18		C		Equipment Instance Identifier	**Yumizen 1**

Example of a QC message sent to the LIS:
OBX|2|NM|HGB||165.2001|g/L|||||F|||20210413104907||||Yumizen 1<CR>

QC result is sent to the LIS as soon as it is considered as valid or confirmed when the user has taken a decision (accepted, rejected or ignored), see details below.

Three OBX segments follow the OBX segments linked to the n parameters.

They describe the status of the QC results as in Yumizen P8000 software:

- QC_RESULT_STATUS
- QC_RESULT_IN_STATISTICS
- LOT_DESCRIPTION

QC result conditions	QC_RESULT_STATUS	QC_RESULT_IN_STATISTICS
All parameters are within tolerance ranges or comply with Westgard rules	VALID	TRUE
A failed QC has been accepted by the user	ACCEPTED	TRUE
A failed QC has been rejected by the user	REJECTED	TRUE or FALSE depending on user decision
A failed QC has been ignored by the user	IGNORED	FALSE

	Values	Note
LOT_DESCRIPTION	DiffTrol	-
	Minotrol Retic	-
	BFTrol	-
	ESRTrol	-
	UNKNOWN	If the lot is not defined in the Yumizen P8000

Example of VALID result

OBX|42|ST|QC_RESULT_STATUS||VALID|||||F<CR>

OBX|43|ST|QC_RESULT_IN_STATISTICS||TRUE|||||F<CR>

OBX|44|ST|LOT_DESCRIPTION||DiffTrol|||||F<CR>

3.6. ORU^R01

The following tables illustrate the structure for message ORU^R01 (compliant with HL7) used to send QC results from the Yumizen P8000 to the LIS:

MSH - Message Header Segment: Date, Time / Message Control ID / Processing ID		Example
MSH|^~\&|YP8K||LIS|| 20210413112501||ORU^R01| 1873659553185571|Q|2.5<CR>	MSH .7 Date/Time of message	**20210413112501**
	MSH .10 Message Control ID	**1873659553185571**
	MSH .11 Processing ID	**Q**

OBR - Observation Request Segment: QC Lot Number / Sample Type / Observ. Date, Time / Specimen Source		Example
OBR|1||PX416H|QC|||| 20210413112453||||||| ^^^^^^Q<CR>	OBR .3 Filler Order Number: QC lot number	**PX416H**
	OBR .4 Universal Service Identifier: Result type	**QC**
	OBR .8 Observation Date/time	**20210413112453**
	OBR .15 Specimen source	**^^^^^^Q**

(from 1 to n parameter) OBX segments including for each: parameters / value / unit / QC run date and time / Device		Example
OBX|1|NM|MPV||10.50001| fL||||F|||20210413104907|||| Yumizen 1<CR>	OBX .2 Value Type: Numeric result	**NM**
	OBX .3 Observation Identifier: QC parameter	**MPV**
	OBX .5 Observation Value: QC parameter value	**10.5**
	OBX .6 Unit	**fL**
	OBX .14 Date/Time of the Observation: Date/ time of device QC run	**20210413104907**
	OBX 18 Equipment Instance Identifier: Device name that ran QC	**Yumizen 1**

(from 1 to n parameter) OBX segments including for each: parameters / value / unit / QC run date and time / Device		Example
OBX|2|NM|HGB||165.2001|g/ L||||F|||20210413104907|||| Yumizen 1<CR>		
OBX|3|NM|RDW-CV||12.3| %||||F|||20210413104907|||| Yumizen 1<CR>		
OBX|4|NM|PLTO||500.00001| 1E09/L||||F||| 20210413104907||||Yumizen 1<CR>		
OBX|5|NM|MCV||89.00001| fL||||F|||20210413104907|||| Yumizen 1<CR>		
OBX|6|NM|LYM#||1.97001| 1E09/L||||F||| 20210413104907||||Yumizen 1<CR>		
OBX|7|NM|PCT||0.066|%|||| F|||20210413104907|||| Yumizen 1<CR>		
OBX|8|NM|BAS#||0.81101| 1E09/L||||F||| 20210413104907||||Yumizen 1<CR>		
OBX|9|NM|EOS#||1.0|1E09/ L||||F|||20210413104907|||| Yumizen 1<CR>		
OBX|10|NM|IMG%||2.4|%|||| F|||20210413104907|||| Yumizen 1<CR>		
OBX|11|NM|PLT||520.00001| 1E09/L||||F||| 20210413104907||||Yumizen 1<CR>		
OBX|12|NM|LIC%||3.3|%|||| F|||20210413104907|||| Yumizen 1<CR>		

(from 1 to n parameter) OBX segments including for each: parameters / value / unit / QC run date and time / Device		Example
OBX|13|NM|EOS%||5.35|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|14|NM|NRBC#||0.845|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|15|NM|MON%||9.37001|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|16|NM|NEU#||11.04|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|17|NM|NEU%||70.9|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|18|NM|MIC||2|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|19|NM|ALY%||2|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|20|NM|MON#||1.54001|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|21|NM|BAS%||4.33|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|22|NM|LIC#||0.05|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|23|NM|HCT||0.4725|L/L|||||F|||20210413104907||||Yumizen 1<CR>		

(from 1 to n parameter) OBX segments including for each: parameters / value / unit / QC run date and time / Device		Example
OBX|24|NM|ALY#||0.25|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|25|NM|NRBC%||5.15001|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|26|NM|IMG#||0.04|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|27|NM|RDW-SD||43.8|fL|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|28|NM|MCHC||352.0001|g/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|29|NM|MAC||2.7|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|30|NM|WBC||17.54|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|31|NM|IMM#||0.00|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|32|NM|IML%||0.6|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|33|NM|TNC||18.90|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		

(from 1 to n parameter) OBX segments including for each: parameters / value / unit / QC run date and time / Device		Example
OBX|34|NM|IML#||0.01|1E09/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|35|NM|RBC||5.285|1E12/L|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|36|NM|IMM%||0.3|%|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|37|NM|PDW||17.6|fL|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|38|NM|MCH||31.25|pg|||||F|||20210413104907||||Yumizen 1<CR>		
OBX|39|NM|LYM%||11.90001|%|||||F|||20210413104907||||Yumizen 1<CR>		

(n+1 … n+3) OBX segments including for each: QC status / QC in statistics / QC material description		Example
OBX|40|ST|QC_RESULT_STATUS||VALID||||||F<CR>	OBX .2 String Data	**ST**
	OBX .3 Observation Identifier	**QC_RESULT_STATUS**
	OBX .5 Observation Value	**VALID**
OBX|41|ST|QC_RESULT_IN_STATISTICS||TRUE||||||F<CR>	OBX .2 String Data	**ST**
	OBX .3 Observation Identifier	**QC_RESULT_IN_STATISTICS**
	OBX .5 Observation Value	**TRUE**
OBX|42|ST|LOT_DESCRIPTION||DiffTrol||||||F<CR>	OBX .2 String Data	**ST**
	OBX .3 Observation Identifier	LOT_DESCRIPTION
	OBX .5 Observation Value	**ABX Difftrol**

(n+1 … n+3) OBX segments including for each: QC status / QC in statistics / QC material description		Example
<FS>		
<CR>		

ACK / NACK message from the LIS to the Yumizen P8000		Example
MSH|^~\&|^|^|YP8K|^|20210413112501||ACK|1873659553185571|P|2.5||||||<CR>	MSH.2 Encoding Characters	^~\&
	MSH.5 Receiving Application	YP8K
	MSH.7 Date/Time Of Message	20210413112501
	MSH.9 Message type	ACK
	MSH.10 Message control id	1873659553185571
	MSH.11 Processing id, always P	P
	MSH.12 Version id	2.5
MSA|AA|1873659553185571<CR>	MSA.1 Acknowledgment code (AA\AE\CA\CE)	AA
	MSA.2 Message Control id related to the ACK/NAK	1873659553185571
<FS>		
<CR>		

3.7. QC to LIS - Detailed Structure

Detailed structure

MSH|^~\&|YP8K||LIS||20221219174423||ORU^R01|873930713772998|Q|2.5<CR>

OBR|1||PX914H|QC||||20221219174422||||||^^^^^^Q<CR>

NTE|0|P||ACCEPTED^ACCEPTED<CR>

OBX|1|NM|ALY%||2|%|||||F|||20221209111602||SUPPORT||YH500 - YH550<CR>

OBX|2|NM|RBC||5.485|1E12/L| **5.3**; **0.08333**| **1:2s,2:2s**|||F|||20221209111602|| **SUPPORT**||
YH500 - YH550<CR>

OBX|3|NM|EOS%||9.35|%|5.9;1.96667|4:1s|||F|||20221209111602||SUPPORT||YH500 -
YH550<CR>

OBX|4|NM|PDW||17.6|fL|||||F|||20221209111602||SUPPORT||YH500 - YH550<CR>

…

OBX|37|NM|NRBC%||6.15001|%|4.0;0.5|1:2s,1:3s|||F|||20221209111602||SUPPORT||
YH500 - YH550<CR>

OBX|38|ST|QC_RESULT_STATUS||ACCEPTED||||||F<CR>

OBX|39|ST|QC_RESULT_IN_STATISTICS||TRUE||||||F<CR>

OBX|40|ST|LOT_DESCRIPTION||DiffTrol||||||F<CR>

<FS>

<CR

Outline

OBX|1|NM|MCV||80|mg/dl|**expected_value**;**deviation**|**rule_alarm**|||F|||20191028145728||
user||Yumizen 1

4. QC Export

4.1. QC Results Availability

Specific settings must be done in Yumizen P8000 to setup the QC export functionality, RAS1115 - Configuring the Application procedure.

Contact your HORIBA Medical technical representative if necessary.

To share QC results with external systems (like LIS or QC expert system), the Yumizen P8000 is generating csv (or xml) files with all results send by the instruments.

The files are available through a FTP connection, on the Yumizen P8000 Server.

The name of the user for the FTP server is **qc_p8000**. The password is **123456789**.

For each export, one or several files are available in CSV or XML format.

As soon as the file has been downloaded, the external system deletes automatically the CSV or XML file.

4.1.1. CSV - File Example (Semicolon Separated) – Used by Default

Qc Sample Id;QC Yumizen P8000 Level;Lot Id;Device Id;Instrument Id;Yumizen P8000 Test Code;Result;Qualitative Result;Reagent;Units;Note;Coded Comment Text;Result Date;Expected Value;Deviation

PX412L;1;PX412;Proto03;Proto03;HGB;69;;;g/L;;;2018-07-04 11:14:37;69.0;1.33333

PX412L;1;PX412;Proto03;Proto03;WBC;2.06;;;1E09/L;;;2018-07-04 11:14:37;2.1;0.13333

PX412L;1;PX412;Proto03;Proto03;NRBC#;0.30;;;1E09/L;;;2018-07-04 11:14:37;0.27;0.04333

PX412L;1;PX412;Proto03;Proto03;NRBC%;14.8;;;%;;;2018-07-04 11:14:37;13.0;1.33333

PX412L;1;PX412;Proto03;Proto03;IMG#;0.01;;;1E09/L;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;IMG%;0.4;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;IMM#;0.00;;;1E09/L;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;ALY#;0.13;;;1E09/L;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;ALY%;6.3;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;BAS#;0.10;;;1E09/L;;;2018-07-04 11:14:37;0.1;0.03333

PX412L;1;PX412;Proto03;Proto03;MCHC;327;;;g/L;;;2018-07-04 11:14:37;351.0;10.0

PX412L;1;PX412;Proto03;Proto03;IMM%;0.0;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;IML#;0.00;;;1E09/L;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;IML%;0.1;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;BAS%;4.7;;;%;;;2018-07-04 11:14:37;4.6;1.53333

PX412L;1;PX412;Proto03;Proto03;EOS#;0.17;;;1E09/L;;;2018-07-04 11:14:37;0.13;0.04333

PX412L;1;PX412;Proto03;Proto03;EOS%;8.1;;;%;;;2018-07-04 11:14:37;6.2;2.06667

PX412L;1;PX412;Proto03;Proto03;MCV;84.2;;;fL;;;2018-07-04 11:14:37;82.0;1.66667

PX412L;1;PX412;Proto03;Proto03;MIC;4.2;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;MAC;2.2;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;RDW-SD;41.7;;;fL;;;2018-07-04 11:14:37;37.0;1.33333

PX412L;1;PX412;Proto03;Proto03;RDW-CV;13.1;;;%;;;2018-07-04 11:14:37;14.0;1.33333

PX412L;1;PX412;Proto03;Proto03;NEU#;0.99;;;1E09/L;;;2018-07-04 11:14:37;1.25;0.11667

PX412L;1;PX412;Proto03;Proto03;NEU%;48.5;;;%;;;2018-07-04 11:14:37;59.4;3.33333

PX412L;1;PX412;Proto03;Proto03;TNC;2.36;;;1E09/L;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;LIC#;0.01;;;1E09/L;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;LIC%;0.5;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;PDW;22.8;;;fL;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;PCT;0.098;;;%;;;2018-07-04 11:14:37;;

PX412L;1;PX412;Proto03;Proto03;MPV;11.9;;;fL;;;2018-07-04 11:14:37;10.5;0.66667

PX412L;1;PX412;Proto03;Proto03;PLT;83;;;1E09/L;;;2018-07-04 11:14:37;70.0;6.66667

PX412L;1;PX412;Proto03;Proto03;MCH;27.5;;;pg;;;2018-07-04 11:14:37;28.8;0.66667

PX412L;1;PX412;Proto03;Proto03;HCT;0.210;;;L/L;;;2018-07-04 11:14:37;0.197;0.005

PX412L;1;PX412;Proto03;Proto03;RBC;2.49;;;1E12/L;;;2018-07-04 11:14:37;2.4;0.05333

PX412L;1;PX412;Proto03;Proto03;MON#;0.18;;;1E09/L;;;2018-07-04 11:14:37;0.14;0.03

PX412L;1;PX412;Proto03;Proto03;MON%;8.6;;;%;;;2018-07-04 11:14:37;6.5;1.43333

PX412L;1;PX412;Proto03;Proto03;LYM#;0.61;;;1E09/L;;;2018-07-04 11:14:37;0.49;0.11

PX412L;1;PX412;Proto03;Proto03;LYM%;29.6;;;%;;;2018-07-04 11:14:37;23.3;4.0

4.1.2. XML File Example

<?xml version="1.0" encoding="UTF-8"?>

<!DOCTYPE qcdata PUBLIC "qcdataid" "qcdata.dtd">

<qcdata xmlns="http://www.isotech.com/2007/qcdata" version="0.2" domain="hematology" created="2018-07-06 12:07:11">

<labinfo>

<instrument manufacturerid="Horiba Medical" instrumentid="Yumizen H2500" serialnumber="M2XH00185">Proto03</instrument>

</labinfo>

<sampleset controlproductid="" lot="PX412L" lotqcperiodidstart="20180704" lotqcperiodidend="20180704">

<result time="2018-07-04 11:14:37">

<value units="g/L" refunits="g/L" paramid="HGB" param="HGB" decimal="0">69</value>

<value units="10^9/L" refunits="10^9/L" paramid="WBC" param="WBC" decimal="2">2.06</value>

<value units="10^9/L" refunits="10^9/L" paramid="NRBC#" param="NRBC#" decimal="2">0.30</value>

<value units="%" refunits="%" paramid="NRBC%" param="NRBC%" decimal="1">14.8</value>

<value units="10^9/L" refunits="10^9/L" paramid="IMG#" param="IMG#" decimal="2">0.01</value>

<value units="%" refunits="%" paramid="IMG%" param="IMG%" decimal="1">0.4</value>

<value units="10^9/L" refunits="10^9/L" paramid="IMM#" param="IMM#" decimal="2">0.00</value>

<value units="10^9/L" refunits="10^9/L" paramid="ALY#" param="ALY#" decimal="2">0.13</value>

<value units="%" refunits="%" paramid="ALY%" param="ALY%" decimal="1">6.3</value>

<value units="10^9/L" refunits="10^9/L" paramid="BAS#" param="BAS#" decimal="2">0.10</value>

<value units="g/L" refunits="g/L" paramid="MCHC" param="MCHC" decimal="0">327</value>

<value units="%" refunits="%" paramid="IMM%" param="IMM%" decimal="1">0.0</value>

<value units="10^9/L" refunits="10^9/L" paramid="IML#" param="IML#" decimal="2">0.00</value>

<value units="%" refunits="%" paramid="IML%" param="IML%" decimal="1">0.1</value>

<value units="%" refunits="%" paramid="BAS%" param="BAS%" decimal="1">4.7</value>

<value units="10^9/L" refunits="10^9/L" paramid="EOS#" param="EOS#" decimal="2">0.17</value>

<value units="%" refunits="%" paramid="EOS%" param="EOS%" decimal="1">8.1</value>

<value units="fL" refunits="fL" paramid="MCV" param="MCV" decimal="1">84.2</value>

<value units="%" refunits="%" paramid="MIC" param="MIC" decimal="1">4.2</value>

<value units="%" refunits="%" paramid="MAC" param="MAC" decimal="1">2.2</value>

<value units="fL" refunits="fL" paramid="RDW-SD" param="RDW-SD" decimal="1">41.7</value>

<value units="%" refunits="%" paramid="RDW-CV" param="RDW-CV" decimal="1">13.1</value>

<value units="10^9/L" refunits="10^9/L" paramid="NEU#" param="NEU#" decimal="2">0.99</value>

<value units="%" refunits="%" paramid="NEU%" param="NEU%" decimal="1">48.5</value>

<value units="10^9/L" refunits="10^9/L" paramid="TNC" param="TNC" decimal="2">2.36</value>

<value units="10^9/L" refunits="10^9/L" paramid="LIC#" param="LIC#" decimal="2">0.01</value>

<value units="%" refunits="%" paramid="LIC%" param="LIC%" decimal="1">0.5</value>

<value units="fL" refunits="fL" paramid="PDW" param="PDW" decimal="1">22.8</value>

<value units="%" refunits="%" paramid="PCT" param="PCT" decimal="3">0.098</value>

<value units="fL" refunits="fL" paramid="MPV" param="MPV" decimal="1">11.9</value>

<value units="10^9/L" refunits="10^9/L" paramid="PLT" param="PLT" decimal="0">83</value>

<value units="pg" refunits="pg" paramid="MCH" param="MCH" decimal="1">27.5</value>

<value units="L/L" refunits="L/L" paramid="HCT" param="HCT" decimal="3">0.210</value>

<value units="10^12/L" refunits="10^12/L" paramid="RBC" param="RBC" decimal="2">2.49</value>

<value units="10^9/L" refunits="10^9/L" paramid="MON#" param="MON#" decimal="2">0.18</value>

<value units="%" refunits="%" paramid="MON%" param="MON%" decimal="1">8.6</value>

<value units="10^9/L" refunits="10^9/L" paramid="LYM#" param="LYM#" decimal="2">0.61</value>

<value units="%" refunits="%" paramid="LYM%" param="LYM%" decimal="1">29.6</value>

</result>

</sampleset>

<sampleset controlproductid="" lot="PX413L" lotqcperiodidstart="20180704" lotqcperiodidend="20180704">

<result time="2018-07-04 11:33:38">

<value units="%" refunits="%" paramid="IML%" param="IML%" decimal="1">0.2</value>

<value units="10^9/L" refunits="10^9/L" paramid="IMG#" param="IMG#" decimal="2">0.01</value>

<value units="%" refunits="%" paramid="IMG%" param="IMG%" decimal="1">0.4</value>

<value units="%" refunits="%" paramid="PCT" param="PCT" decimal="3">0.100</value>

<value units="fL" refunits="fL" paramid="PDW" param="PDW" decimal="1">21.1</value>

<value units="%" refunits="%" paramid="MAC" param="MAC" decimal="1">2.5</value>

<value units="10^9/L" refunits="10^9/L" paramid="IML#" param="IML#" decimal="2">0.00</value>

<value units="10^9/L" refunits="10^9/L" paramid="WBC" param="WBC" decimal="2">2.02</value>

<value units="%" refunits="%" paramid="BAS%" param="BAS%" decimal="1">4.7</value>

<value units="%" refunits="%" paramid="EOS%" param="EOS%" decimal="1">9.7</value>

<value units="%" refunits="%" paramid="NRBC%" param="NRBC%" decimal="1">16.5</value>

<value units="fL" refunits="fL" paramid="RDW-SD" param="RDW-SD" decimal="1">40.5</value>

<value units="L/L" refunits="L/L" paramid="HCT" param="HCT" decimal="3">0.210</value>

<value units="fL" refunits="fL" paramid="MCV" param="MCV" decimal="1">84.1</value>

<value units="10^9/L" refunits="10^9/L" paramid="EOS#" param="EOS#" decimal="2">0.20</value>

<value units="10^9/L" refunits="10^9/L" paramid="BAS#" param="BAS#" decimal="2">0.09</value>

<value units="10^12/L" refunits="10^12/L" paramid="RBC" param="RBC" decimal="2">2.49</value>

<value units="10^9/L" refunits="10^9/L" paramid="NRBC#" param="NRBC#" decimal="2">0.33</value>

<value units="10^9/L" refunits="10^9/L" paramid="NEU#" param="NEU#" decimal="2">1.01</value>

<value units="g/L" refunits="g/L" paramid="MCHC" param="MCHC" decimal="0">328</value>

<value units="10^9/L" refunits="10^9/L" paramid="PLT" param="PLT" decimal="0">78</value>

<value units="g/L" refunits="g/L" paramid="HGB" param="HGB" decimal="0">69</value>

<value units="fL" refunits="fL" paramid="MPV" param="MPV" decimal="1">12.9</value>

<value units="%" refunits="%" paramid="RDW-CV" param="RDW-CV" decimal="1">12.7</value>

<value units="pg" refunits="pg" paramid="MCH" param="MCH" decimal="1">27.6</value>

<value units="%" refunits="%" paramid="LYM%" param="LYM%" decimal="1">26.5</value>

<value units="10^9/L" refunits="10^9/L" paramid="TNC" param="TNC" decimal="2">2.35</value>

<value units="%" refunits="%" paramid="MIC%" param="MIC%" decimal="1">4.6</value>

<value units="10^9/L" refunits="10^9/L" paramid="LIC#" param="LIC#" decimal="2">0.01</value>

<value units="10^9/L" refunits="10^9/L" paramid="IMM#" param="IMM#" decimal="2">0.00</value>

<value units="%" refunits="%" paramid="MON%" param="MON%" decimal="1">8.5</value>

<value units="%" refunits="%" paramid="ALY%" param="ALY%" decimal="1">5.1</value>

<value units="%" refunits="%" paramid="LIC%" param="LIC%" decimal="1">0.6</value>

<value units="10^9/L" refunits="10^9/L" paramid="ALY#" param="ALY#" decimal="2">0.10</value>

<value units="10^9/L" refunits="10^9/L" paramid="LYM#" param="LYM#" decimal="2">0.54</value>

<value units="10^9/L" refunits="10^9/L" paramid="MON#" param="MON#" decimal="2">0.17</value>

<value units="%" refunits="%" paramid="IMM%" param="IMM%" decimal="1">0.0</value>

</result>

<result time="2018-07-04 11:48:08">

<value units="10^9/L" refunits="10^9/L" paramid="WBC" param="WBC" decimal="2">1.93</value>

<value units="%" refunits="%" paramid="NRBC%" param="NRBC%" decimal="1">22.8</value>

<value units="%" refunits="%" paramid="ALY%" param="ALY%" decimal="1">4.9</value>

<value units="%" refunits="%" paramid="MON%" param="MON%" decimal="1">7.5</value>

<value units="10^9/L" refunits="10^9/L" paramid="MON#" param="MON#" decimal="2">0.14</value>

<value units="10^9/L" refunits="10^9/L" paramid="LYM#" param="LYM#" decimal="2">0.65</value>

<value units="10^9/L" refunits="10^9/L" paramid="PLT" param="PLT" decimal="0">77</value>

<value units="10^9/L" refunits="10^9/L" paramid="BAS#" param="BAS#" decimal="2">0.09</value>

<value units="10^9/L" refunits="10^9/L" paramid="EOS#" param="EOS#" decimal="2">0.13</value>

<value units="%" refunits="%" paramid="BAS%" param="BAS%" decimal="1">4.6</value>

<value units="%" refunits="%" paramid="EOS%" param="EOS%" decimal="1">6.8</value>

<value units="fL" refunits="fL" paramid="MCV" param="MCV" decimal="1">84.8</value>

<value units="%" refunits="%" paramid="RDW-CV" param="RDW-CV" decimal="1">12.3</value>

<value units="10^9/L" refunits="10^9/L" paramid="NEU#" param="NEU#" decimal="2">0.91</value>

<value units="L/L" refunits="L/L" paramid="HCT" param="HCT" decimal="3">0.207</value>

<value units="%" refunits="%" paramid="LIC%" param="LIC%" decimal="1">0.3</value>

<value units="10^9/L" refunits="10^9/L" paramid="IMG#" param="IMG#" decimal="2">0.00</value>

<value units="10^9/L" refunits="10^9/L" paramid="TNC" param="TNC" decimal="2">2.37</value>

<value units="%" refunits="%" paramid="IML%" param="IML%" decimal="1">0.3</value>

<value units="fL" refunits="fL" paramid="PDW" param="PDW" decimal="1">22.1</value>

<value units="%" refunits="%" paramid="MIC" param="MIC" decimal="1">4.3</value>

<value units="%" refunits="%" paramid="IMG%" param="IMG%" decimal="1">0.0</value>

<value units="%" refunits="%" paramid="MAC" param="MAC" decimal="1">2.9</value>

<value units="%" refunits="%" paramid="PCT" param="PCT" decimal="3">0.100</value>

<value units="%" refunits="%" paramid="IMM%" param="IMM%" decimal="1">0.0</value>

<value units="10^9/L" refunits="10^9/L" paramid="IML#" param="IML#" decimal="2">0.01</value>

<value units="10^9/L" refunits="10^9/L" paramid="LIC#" param="LIC#" decimal="2">0.01</value>

<value units="10^9/L" refunits="10^9/L" paramid="IMM#" param="IMM#" decimal="2">0.00</value>

<value units="10^9/L" refunits="10^9/L" paramid="ALY#" param="ALY#" decimal="2">0.09</value>

<value units="g/L" refunits="g/L" paramid="HGB" param="HGB" decimal="0">68</value>

<value units="pg" refunits="pg" paramid="MCH" param="MCH" decimal="1">27.9</value>

<value units="%" refunits="%" paramid="LYM%" param="LYM%" decimal="1">33.5</value>

<value units="fL" refunits="fL" paramid="RDW-SD" param="RDW-SD" decimal="1">38.1</value>

<value units="g/L" refunits="g/L" paramid="MCHC" param="MCHC" decimal="0">329</value>

<value units="fL" refunits="fL" paramid="MPV" param="MPV" decimal="1">13.0</value>

<value units="10^9/L" refunits="10^9/L" paramid="NRBC#" param="NRBC#" decimal="2">0.44</value>

<value units="10^12/L" refunits="10^12/L" paramid="RBC" param="RBC" decimal="2">2.44</value>

</result>

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<value units="10^9/L" refunits="10^9/L" paramid="IMM#" param="IMM#" decimal="2">0.00</value>

<value units="10^9/L" refunits="10^9/L" paramid="NRBC#" param="NRBC#" decimal="2">0.34</value>

<value units="10^9/L" refunits="10^9/L" paramid="NEU#" param="NEU#" decimal="2">0.98</value>

<value units="g/L" refunits="g/L" paramid="MCHC" param="MCHC" decimal="0">334</value>

<value units="fL" refunits="fL" paramid="RDW-SD" param="RDW-SD" decimal="1">39.3</value>

<value units="%" refunits="%" paramid="MIC" param="MIC" decimal="1">5.4</value>

<value units="%" refunits="%" paramid="LYM%" param="LYM%" decimal="1">30.1</value>

<value units="%" refunits="%" paramid="MON%" param="MON%" decimal="1">8.2</value>

<value units="10^9/L" refunits="10^9/L" paramid="ALY#" param="ALY#" decimal="2">0.12</value>

<value units="%" refunits="%" paramid="LIC%" param="LIC%" decimal="1">0.2</value>

<value units="%" refunits="%" paramid="NRBC%" param="NRBC%" decimal="1">16.4</value>

<value units="10^9/L" refunits="10^9/L" paramid="LIC#" param="LIC#" decimal="2">0.00</value>

<value units="pg" refunits="pg" paramid="MCH" param="MCH" decimal="1">28.3</value>

<value units="10^9/L" refunits="10^9/L" paramid="LYM#" param="LYM#" decimal="2">0.61</value>

<value units="10^9/L" refunits="10^9/L" paramid="MON#" param="MON#" decimal="2">0.17</value>

<value units="10^9/L" refunits="10^9/L" paramid="PLT" param="PLT" decimal="0">76</value>

<value units="%" refunits="%" paramid="MAC" param="MAC" decimal="1">3.3</value>

<value units="%" refunits="%" paramid="PCT" param="PCT" decimal="3">0.092</value>

<value units="g/L" refunits="g/L" paramid="HGB" param="HGB" decimal="0">69</value>

<value units="L/L" refunits="L/L" paramid="HCT" param="HCT" decimal="3">0.205</value>

<value units="fL" refunits="fL" paramid="MPV" param="MPV" decimal="1">12.2</value>

<value units="10^9/L" refunits="10^9/L" paramid="IML#" param="IML#" decimal="2">0.00</value>

<value units="10^9/L" refunits="10^9/L" paramid="IMG#" param="IMG#" decimal="2">0.00</value>

<value units="%" refunits="%" paramid="RDW-CV" param="RDW-CV" decimal="1">12.6</value>

<value units="%" refunits="%" paramid="IML%" param="IML%" decimal="1">0.2</value>

<value units="%" refunits="%" paramid="IMG%" param="IMG%" decimal="1">0.0</value>

<value units="fL" refunits="fL" paramid="MCV" param="MCV" decimal="1">84.7</value>

<value units="fL" refunits="fL" paramid="PDW" param="PDW" decimal="1">16.9</value>

<value units="%" refunits="%" paramid="EOS%" param="EOS%" decimal="1">8.8</value>

<value units="%" refunits="%" paramid="BAS%" param="BAS%" decimal="1">4.7</value>

<value units="10^9/L" refunits="10^9/L" paramid="EOS#" param="EOS#" decimal="2">0.18</value>

<value units="10^9/L" refunits="10^9/L" paramid="BAS#" param="BAS#" decimal="2">0.10</value>

<value units="%" refunits="%" paramid="NEU%" param="NEU%" decimal="1">48.0</
value>

<value units="%" refunits="%" paramid="ALY%" param="ALY%" decimal="1">5.8</
value>

<value units="10^9/L" refunits="10^9/L" paramid="TNC" param="TNC"
decimal="2">2.38</value>

<value units="10^9/L" refunits="10^9/L" paramid="WBC" param="WBC"
decimal="2">2.04</value>

<value units="10^12/L" refunits="10^12/L" paramid="RBC" param="RBC"
decimal="2">2.42</value>

</result>

</sampleset>

</qcdata>