HORIBA Medical

Yumizen P8000

Output Format for Host Connection

Ref: RAA060BEN

Output Format for Host Connection

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Contents

1. Foreword

1.1. Document Update

1.1.1. Revisions

Internal Reference	Software Version	Document Date Issued
RAA060AEN	1.0.x	March 2017
RAA060BEN	1.2.x	July 2018

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?

Here is the list of major updates in this document release:

- Addition of two new parameters
- Correction of some incorrect lengths of field
- Correction of some incorrect types of field (required and optional)
- Correction of panels send by the LIS
- Deletion of the example message for results without images.

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

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.

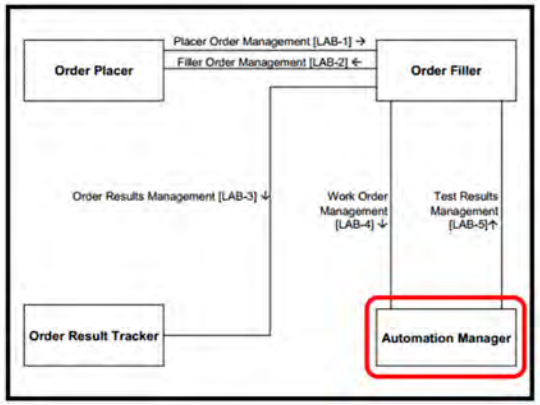
2.1.2. Interface Description

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 workflow.
- 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.
- LIS must communicate with two lines:
  - 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. Comments

Yumizen P8000 does not manage reruns coming from LIS.

Yumizen P8000 manages reflex coming from LIS.

2.1.5. 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).
ACK Generic Acknowledgement Message	Commit Acknowledgement/Rejection of a message used for both request and result message.

2.1.5.1. 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		

Segment	Meaning	Usage	Card.
{	--- SPECIMEN begin	R	[1..*]
SPM	Specimen	R	[1..1]
{	--- ORDER begin		
ORC	Common Order	R	[1..1]
[{TQ1}]	Timing Quantity	RE	[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		

2.1.5.2. 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	O	[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	O	[0..*]
OBX	Observation Result	R	[1..1]
[{NTE}]	Notes and Comments	O	[0..*]
}]	--- RESULT end		
}	--- ORDER end		
}	--- SPECIMEN end		

2.1.5.3. 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 Message 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	
14		X		Continuation Pointer	
15		X		Accept Acknowledgment Type	
16		X		Application Acknowledgment Type	
17		X		Country Code	
18		X		Character Set	
19		X		Principal language of message	

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	
19		X		Principal language of message	

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	[0..1]	Set ID - PID	
2		X		Patient ID	

SEQ	LEN	OPT	Card.	Element name	Example
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		R	[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	CE	[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		CE	[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	
17		X		Religion	
18		X	[0..1]	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	

SEQ	LEN	OPT	Card.	Element name	Example
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	

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	[0..1]	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		R	[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	CE	[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		CE	[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	

SEQ	LEN	OPT	Card.	Element name	Example
17		X		Religion	
18		X	[0..1]	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	

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	[0..1]	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		C	[0..1]	Assigned Patient Location	**EMERGENCY^ROOM1^ BED1**
	20				Point of Care: EMERGENCY
	30				Room: ROOM1
	30				Bed: BED1
4		X		Admission Type	
5		X		Preadmit Number	
6		X		Prior Patient Location	
7		O	[0..*]	Attending Doctor	**ATD^DR HOUSE**
					Type: ATD
	50				Name: DR HOUSE
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	

SEQ	LEN	OPT	Card.	Element name	Example
14		X		Admit Source	
15		X		Ambulatory Status	
16		X		VIP Indicator	
17		O	[0..*]	Admitting Doctor	**ADD^DR WILSON**
					Type: ADD
	50				Name: DR WILSON
18		X		Patient Type	
19	30	O	[0..1]	Visit Number	**ABC123^LIS**
					Number: ABC123
					Receiving application: LIS
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	

SEQ	LEN	OPT	Card.	Element name	Example
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|EMERGENCY^ROOM1^BED1||||ATD^DR HOUSE|||||||||ADD^DR WILSON||
ABC123^LIS||||||||||||||||||||||||||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	[0..1]	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

SEQ	LEN	OPT	Card.	Element name	Example
3		C	[0..1]	Assigned Patient Location	**EMERGENCY^ROOM1^ BED1**
	20				Point of Care: EMERGENCY
	30				Room: ROOM1
	30				Bed: BED1
4		X		Admission Type	
5		X		Preadmit Number	
6		X		Prior Patient Location	
7		O	[0..*]	Attending Doctor	**ATD^DR HOUSE**
					Type: ATD
	50				Name: DR HOUSE
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	50	O	[0..*]	Admitting Doctor	
18		X		Patient Type	
19	30	O	[0..1]	Visit Number	**ABC123**
					Number: ABC123
20		X		Financial Class	
21		X		Charge Price Indicator	
22		X		Courtesy Code	
23		X		Credit Rating	
24		X		Contract Code	

SEQ	LEN	OPT	Card.	Element name	Example
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 Yumizen P8000:
PV1||N|EMERGENCY^ROOM1^BED1||||ATD^DR HOUSE||||||||||^||ABC123|||||||||||||||||||||||||
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	[0..1]	Specimen Parent IDs	
4	15	R	[1..1]	Specimen Type	**EDTA** (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	RE	[0..1]	Specimen Collection Date/Time	**201604160904**
18	14	C	[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||EDTA||||MAIN LAB|||||||||201604160904|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	RE	[0..1]	Sample ID	**201604163002**
3		X	[0..1]	Specimen Parent IDs	
4	15	R	[1..1]	Specimen Type	**EDTA** (editable)
5		X		Specimen Type Modifier	
6		X		Specimen Additives	
7		X		Specimen Collection Method	

SEQ	LEN	OPT	Card.	Element name	Example
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	O	[0..1]	Specimen Collection Date/Time	
18	14	O	[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||EDTA||||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

- 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	**L604163002**
3	20	R	[0..1]	Filler Order Number	**L604163002**

SEQ	LEN	OPT	Card.	Element name	Example
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		RE		Specimen Action Code	**EDTA**
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	20	O		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	

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||||||||||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		R	[1..1]	Universal Service Identifier	**RDW-SD^RDW-SD^YP8K**
	31				Code: RDW-SD
					Name: RDW-SD profile
					Sending application: YP8K
5		X		Priority	
6		X		Requested Date/Time	
7		RE		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	
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	

Example of an observation result segment from Yumizen P8000:
OBR|1|L604163002|L604163002|RDW-SD^RDW-SD^YP8K|||20160416090400|||||||DR HOUSE|||||||F|||||||ruleResult

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** **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. **CA**: Cancel order/service request. Event request in OML message sent by the order placer in LAB-1 or in OML message sent by the order filler in LAB-4. **SC**: Status changed *Not supported in 1.0.x.* **PR**: Previous values.
2	20	R	[0..1]	Placer Order Number	**L604163002**
3	20	R	[0..1]	Filler Order Number	**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	**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		RE		Ordering Facility Name	**hematology^^^^^^^^^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	

SEQ 2, 3 & 4 fields cannot be empty and must be unique.

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	**SC**: 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. **CA**: Cancel order/service request. Event request in OML message sent by the order placer in LAB-1 or in OML message sent by the order filler in LAB-4. **SC**: Status changed *Not supported in 1.0.x.*
2	20	C	[0..1]	Placer Order Number	**L604163002**
3	20	C	[0..1]	Filler Order Number	**L604163002**
4	20	RE	[0..1]	Placer Group Number	**L604163002**
5		RE		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		RE		Ordering Facility Name	^^^^^^^^^
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	

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	[1..1]	Set ID - TQ1	
2		X	[0..1]	Quantity	

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

2.2.8.1. From Yumizen P8000 to LIS

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

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.

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	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	**20160728150751**
15		X		Producer's ID	
16		X		Responsible Observer	
17		X		Observation Method	
18		X	[0..1]	Equipment Instance Identifier	
19		X	[0..1]	Date/Time of the Analysis	

Example of a generic observation/result segment from LIS:
OBX|1|CE|CLL||Clinical comment.||||||F|||20160728150751||

2.2.9.2. From Yumizen P8000 to LIS

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		R	[1..1]	Observation Identifier	**RDW-SD^RDW-SD**
	31				Code: RDW-SD
					Name: RDW-SD
4		X		Observation Sub-ID	
5	50	C	[0..1]	Observation Value	**45.0**
6	20	C	[0..1]	Units	**fl**
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	

SEQ	LEN	OPT	Card.	Element name	Example
13		X		User Defined Access Checks	
14	14	RE	[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	[0..1]	Date/Tme of the Analysis	

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

Images are also sent using PNG format with base64 encoding.

Example of a BASO curve from Yumizen P8000:
OBX|1|ED|BASO||
^IM^PNG^Base64^iVBORw0KGgoAAAANSUhEUgAAAQQAAAB2CAIAAACh93ojAAAH
mklEQVR42u2d208UVxyA980H46sPPhjjm0/1T8CYiNwUixcILgi7Ui/
V1jatynJZUcplpVZl1WJLja3bsq7YqnRBI1CsXKUgKJRSbWLUB2LbTTRFJbo9YXDcrrhsl
Zk5u35fJpthmLjMmd/n7/xmzpwx
+QFgHBNNAIAMAMgAgAwAyACADADIAIAMAMgAgAwAyAAgkwwlpWVfHneFucTExIS/
M0uELgaeZfHVzc3NhsIw0Hnk/KWuMBeTyRT+zhaLxRpAQkKC9b+85pbE5SvC/
2NYNDrL0/7VRspQWlauRTM1d/QWFhZqmhMLi4q/
Pf0jsYsM0yaD3W7XopkudfVpLcPwjZub3/+I2EUG2TND59VBrWUQxCUuJ3aRYdpk2Lf/
oBbN1PbLtT179mgtw9ZtH567eJnwRQapM0NL2xWn06m1DG5PrWP/
YcIXGaSuGerON7pcLq1l+POvv7NyNhG+yCB1Zjj1/Tmv16vDfZb4ZcmELzJIXTMc
+9rV3t6ugwzWdzYTvsggdWaoPHRkaGhIBxk2bN5K
+CKD1DVDSWn5yMiIDjLk23efPHueCEYGeTODLS9/
bGxMBxmOVh87VP0NEYwM8tYMO3Nz9Rmo2HChcVdJBRGMDBJnBluePjIM3/
hjywfbiWBkkLdmKCgo0EeGf0YfmrNziGBkkDczWCwWfWR4+vSpOWs9EYwM8tYMIuHo
9nzTUobrIYPMmUFPGegmIYPUNQMyIAOZARmQgZoBGZCBzGC4DMwMgAzUDBMw
MwAykBnUm9DMDIAM1AzPYGYAZCAzTMDMAMhAzTABMwMgA5lhAmYGQAZqhufEJ
zEzADKQGcaxbmBmAGSgZhgnr7DIfaaBUEYG6TKD1WrVWQZXjcdx4AihjAwh9zCZ9K8
ZdJh1Olih4RvvbvuYUEaGV5dBi8ygw8sZXuTRo8dr11kJZWR4Hvfi35o/f/
7MmTOrq6vVjXV1dWLjjBkzkpKS7t27p3XNoMPLGV5yQYkRe8gQIENKSsrt27eHhoZmz5
6tbty4cePdu3fFutfrzcnJ0TozdPQO6F9AC9ZzQQkZAmW4f/
9+UO8oqJs0Z84crWuGlo4eh8Ohvwz59t1cUEKGScqDl8kgelCBP1bs2z/tzXSxpbWqqkp/
GWo8tVxQQoYpZOjv71e3z507V+ua4Yz3Qk1Njf4y/Pb7TS4oIcMUMsybN294eFis9/
T0iKJC65rBXftDfX29/
jI8fjzGBSVkCCXDrFmz3G73ggULRAcpLi7u1q1bWtcMXx0/0dbW5jeCRN5dggxS3YE
+9PnRgYEBQ2TwnDr9ScUBAhoZZBmbVOaouHPnjt8gkpYlx8YlEtPIlEVmsO8qevDggVE
y+Hy
+txYuZloAZJDieYbtO3b6DYUpApBBlsyQa7P5jYYpApBBippBtzeVhIApApBBisyg25tKQs
AUAcggRc2g/
5M9L8lUAchgfGYw5GGGSUngBhwyGFsztHZfk0QG5mBFBoMzQ0fvQFFRkQwycIEVGQ
yuGX5q7Xl6nX45iE
+kp4QMxmWGs94LbrdbEhnoKSGDkTWDq8bzOsdDTwkZoiczHK764vr1635piB+/
Fd3V92tmZibv+EEGXWuGktLykZEReWRQBnWLz/r6egZ4l4OumWFnru3Jkyd
+mUhanpyWlqasx8YnEe7IoFPNIMMovSDMZrPP52PMEjLonRny8/
P9EsOYJWTQqWZo7ui1WCwyy8CYJWTQKTN09A7IMGR1iutLvNYEGXSoGVrarlRWVko
uw6Yt7zW0dBL0yKBtZnDVeJqamiSX4bODzuoTHoIeGbStGcrKHVLdZJiUzq7uHQW7CX
rZZGhq74mqzJCba/
NLz8OHj8xZ6wl62WTovDoYPTXDpa6+7OxsfySwNIHpAqST4ef27ujJDN19g8XFxREhgzk
7RxmtZLVaGbAkiQzfnayNnprB7altbGyMFBmU0Up
+ZqSURoZyx97oyQyFdvvo6GhEyCASgkgLzwcvLUtuae00m81i+4q3V9Z6G4MOrad/
8M2ZstIoGWy2vCipGUSvlyMjwx+Z+Hy+RYsWKeOXxGdsXII4InVC78tX+tPT03fY8t
+Q54QMkUE0clZWVpRkBrXXEQUoHafVa9Yo3afWju7Kyso35zkhQ2RQGjkaagbRi1DHS
EcHSm0tuk+iy7S34INlUnFl+Lc4WNGhUnpTynpg58pisbysr4UMIRalkSM
+M4gO0uLFi9Ux0tGEOCgR6+r1Yus4yoBw5VdLlixRO1eKFcoEasqPQdepluVpu3BkeIWX
wojDj42NnfTwxa9Ec/mfvbs5gmuGaOogadHdCmoo+S9eibM85V
+o9iHDX0IcvhpCBsuQnW3JXJe11mwW/RzxmZqapq4r21NSUtT1mJiYF/
dJT18rjBIZRvS4xCfrgesZGZmrVq9W2iojM1PZvnLVqsA2F+vqPup2sSX0PoHnJZxzF/
4+4iyLcxp6H+W8/6/vUuNEtEnQPqmpqUq7ia9+nTeIm/
gPGAAZAJABABkAkAEAGQCQAQAZAJABABkAkAEAGQCQAQAZAJABABkAkAEAGQ
CQAQAZAJABABkAkAEAGQCQAQAZAJABABkAkAEgevgX4Tpp/u
+X2ikAAAAASUVORK5CYII=|||N|||F|||20170328101027||||702M2SH00019

2.2.10. MSA - Message Acknowledgment Segment

The MSA segment contains information sent while acknowledging another message.

2.2.10.1. MSA - Message Acknowledgment Segment

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. MSA - Message Acknowledgment Segment

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. Special characteristics for HORIBA Medical data

2.2.11.1. Parameters

CBC Code	Definition
WBC	White Blood Cells
TNC	Total Nucleated cells
CWBC	Corrected White Blood Cells
RBC	Red Blood Cells
HGB	Hemoglobin Concentration
HCT	Hematocrit
MCV	Mean Corpuscular Volume
MCH	Mean Corpuscular Hemoglobin
MCHC	Mean Corpuscular Hemoglobin Concentration
RDW-CV	Red Distribution Width
RDW-SD	Red Distribution Width Standard Deviation
PLT	Platelets
PDW *	Platelets Distribution Width
PCT *	Plateletcrit
MPV	Mean Platelet Volume
MIC% *	Microcytic Red Blood Cells percentage (versus RBC)
MAC% *	Macrocytic Red Blood Cells percentage (versus RBC)
PLTO	Platelets from optical channel

DIFF Code	Definition
LYM#	Lymphocytes absolute value
LYM%	Lymphocytes percentage
MON#	Monocytes absolute value
MON%	Monocytes percentage
NEU#	Neutrophils absolute value
NEU%	Neutrophils percentage
EOS#	Eosinophils absolute value
EOS%	Eosinophils percentage
BAS#	Basophils absolute value
BAS%	Basophils percentage
ALY# *	Atypical Lymphocytes absolute value
ALY% *	Atypical Lymphocytes percentage
LIC# *	Large Immature Cells absolute value
LIC% *	Large Immature Cells percentage
Band Cel%	Bands percentage
Band Cel#	Bands absolute value
Metamyelo%	Metamyelocytes percentage
Metamyelo#	Metamyelocytes absolute value
Myelocytes%	Myelocytes percentage
Myelocytes#	Myelocytes absolute value
Blast%	Blasts percentage
Blast#	Blasts absolute value
Promyelo%	Promyelocytes percentage
Promyelo#	Promyelocytes absolute value
Plasmocyte%	Plasmocytes percentage
Plasmocyte#	Plasmocytes absolute value
ProLympho%	Prolymphocytes percentage
ProLympho#	Prolymphocytes absolute value
HyperBasoLY%	Hyper baso lymphocytes percentage
HyperBasoLY#	Hyper baso lymphocytes absolute value

DIFF Code	Definition
Promonocyte%	Promonocytes percentage
Promonocyte#	Promonocytes absolute value
Sezary Cel%	Sezary cells percentage
Sezary Cel#	Sezary cells absolute value
Other%	Other cells percentage
Other#	Other cells absolute value
AtypLympho%	Atypical Lymphocytes percentage (manual count)
AtypLympho#	Atypical Lymphocytes absolute value (manual count)

Extended DIFF Code	Definition
IML# *	Immature Lymphocytic cells absolute value
IML% *	Immature Lymphocytic cells percentage
IMM# *	Immature Monocytic cells absolute value
IMM% *	Immature Monocytic cells percentage
IMG# *	Immature Granulocytic cells absolute value
IMG% *	Immature Granulocytic cells percentage
NRBC#	Nucleated Red Blood Cells absolute value
NRBC%	Nucleated Red Blood Cells percentage

RET Code	Definition
RET#	Reticulocytes absolute value
RET%	Reticulocytes percentage
RETL% *	Reticulocytes with a low RNA content
RETM% *	Reticulocytes with a medium RNA content
RETH% *	Reticulocytes with a high RNA content
CRC	Corrected Reticulocyte Count
MRV *	Mean Reticulocyte Volume
MFI% *	Mean Fluorescence Index
IRF	Immature Reticulocyte Fraction

RET Code	Definition
RHCc	Reticulocyte Hemoglobin Cellular content
PIC *	Fluorescence range

* USA only: PDW, PCT, PLTOPT, ALY#, ALY%, LIC#, LIC%, IML#, IML%, IMM#, IMM%, IMG#, IMG%, MFI%, RHCc have not been validated for a clinical diagnostic use in USA for this instrument.

This list of codes can be modified through a conversion table.

2.2.11.2. 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.

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|EMERGENCY^ROOM1^BED1||||ATD^DR HOUSE|||||||||ADD^DR WILSON|| ABC123^LIS|||||||||||||||||||||||||20160416090430|20160416090430<CR>

SPM|1|201604163002||EDTA||||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|EMERGENCY^ROOM1^BED1||||ATD^DR HOUSE|||||||||ADD^DR WILSON|| ABC123^LIS|||||||||||||||||||||||20160416090430|20160416090430<CR>

SPM|1|201604163002||EDTA||||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>

PV1||N|EMERGENCY^ROOM1^BED1||||ATD^DR HOUSE|||||||||ADD^DR WILSON|| ABC123^LIS|||||||||||||||||||||||20150131110927|20150131110927<CR>

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

OBR|1|L503111235|L503111235|WBC^^P8000||||||EDTA|||||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|^~\&|HALIA|^^|^^|^^|20170316150854||OUL^R22^OUL_R22| HALIA20170316150854|P|2.5||||||<CR>

PID|||075203111022^^^LIS^PI||PAT 1703161652^PAT 1703161652^^^^^||20020625|F||| Main Street^^Springfield^NY^65466^USA^ATC1||||||ABC123|||||||||||Y<CR>

PV1||N|WARD00009^^||||ATD^DR HORIBA|||||||||^||ABC123|||||||||||||||||||||20170316123431| 20170316123431<CR>

SPM|1|075203111022||EDTA||||MAIN LAB<CR>

OBR|1|1703161652|1703161652|RDW-SD^RDW-SD^HALIA|||20170316123431|||||||DR HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||| WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|RDW-SD^RDW-SD||44.5|fl|||||F|||20170316150836||||702M1XH00022<CR>

OBR|2|1703161652|1703161652|LIC#^LIC#^HALIA|||20170316123431|||||||DR HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||| WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|LIC#^LIC#||0.05|10\S\3/mm3|0.0 - 0.3||||F|||20170316150836|||| 702M1XH00022<CR>

OBR|3|1703161652|1703161652|ERB#^ERB#^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|ERB#^ERB#||0.84|10\S\3/mm3|||||F|||20170316150836||||702M1XH00022<CR>

OBR|4|1703161652|1703161652|LIC%^LIC%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|LIC%^LIC%||1.1|%|0.0 - 3.0||||F|||20170316150836||||702M1XH00022<CR>

OBR|5|1703161652|1703161652|BAS#^BAS#^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|BAS#^BAS#||0.06|10\S\3/mm3|0.0 - 0.2||||F|||20170316150836||||
702M1XH00022<CR>

OBR|6|1703161652|1703161652|ALY%^ALY%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|ALY%^ALY%||1.3|%|0.0 - 2.5||||F|||20170316150836||||702M1XH00022<CR>

OBR|7|1703161652|1703161652|ALY#^ALY#^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|ALY#^ALY#||0.07|10\S\3/mm3|0.0 - 0.25||||F|||20170316150836||||
702M1XH00022<CR>

OBR|8|1703161652|1703161652|EOS#^EOS#^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|EOS#^EOS#||0.23|10\S\3/mm3|0.0 - 0.5||||F|||20170316150836||||
702M1XH00022<CR>

OBR|9|1703161652|1703161652|BAS%^BAS%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|BAS%^BAS%||1.2|%|0.0 - 4.0||||F|||20170316150836||||702M1XH00022<CR>

OBR|10|1703161652|1703161652|ERB%^ERB%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|ERB%^ERB%||16.9|%|||||F|||20170316150836||||702M1XH00022<CR>

OBR|11|1703161652|1703161652|MON%^MON%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|MON%^MON%||8.1|%|2.0 - 15.0||||F|||20170316150836||||
702M1XH00022<CR>

OBR|12|1703161652|1703161652|PDW^PDW^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|PDW^PDW||16.8|%|||||F|||20170316150836||||702M1XH00022<CR>

OBR|13|1703161652|1703161652|EOS%^EOS%^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|EOS%^EOS%||4.6|%|0.0 - 15.0||||F|||20170316150836||||702M1XH00022<CR>

OBR|14|1703161652|1703161652|MON#^MON#^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|MON#^MON#||0.40|10\S\3/mm3|||||F|||20170316150836||||
702M1XH00022<CR>

OBR|15|1703161652|1703161652|MCV^MCV^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|MCV^MCV||89.6|?m3|77.0 - 100.0||||F|||20170316150836||||
702M1XH00022<CR>

OBR|16|1703161652|1703161652|IML%^IML%^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|IML%^IML%||0.0|%|0.0 - 2.5||||F|||20170316150836||||702M1XH00022<CR>

OBR|17|1703161652|1703161652|IMG%^IMG%^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|IMG%^IMG%||0.2|%|0.0 - 2.5||||F|||20170316150836||||702M1XH00022<CR>

OBR|18|1703161652|1703161652|IMG#^IMG#^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|IMG#^IMG#||0.01|10\S\3/mm3|||||F|||20170316150836||||702M1XH00022<CR>

OBR|19|1703161652|1703161652|IML#^IML#^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|IML#^IML#||0.00|10\S\3/mm3|||||F|||20170316150836||||702M1XH00022<CR>

OBR|20|1703161652|1703161652|LYM#^LYM#^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|LYM#^LYM#||2.22|10\S\3/mm3|1.5 - 4.0||||F|||20170316150836||||
702M1XH00022<CR>

OBR|21|1703161652|1703161652|MCH^MCH^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|MCH^MCH||29.7|pg|27.0 - 32.0||||F|||20170316150836||||702M1XH00022<CR>

OBR|22|1703161652|1703161652|LYM%^LYM%^HALIA|||20170316123431|||||||DR
HORIBA|||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|LYM%^LYM%||44.8|%|5.0 - 45.0||||F|||20170316150836||||
702M1XH00022<CR>

OBR|23|1703161652|1703161652|MIC%^MIC%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|MIC%^MIC%||4.9|%|||||F|||20170316150836||||702M1XH00022<CR>

OBR|24|1703161652|1703161652|MPV^MPV^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|MPV^MPV||9.3|?m3|||||F|||20170316150836||||702M1XH00022<CR>

OBR|25|1703161652|1703161652|MCHC^MCHC^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|MCHC^MCHC||331|g/dL|||||F|||20170316150836||||702M1XH00022<CR>

OBR|26|1703161652|1703161652|NEU#^NEU#^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|NEU#^NEU#||1.99|10\S\3/mm3|1.8 - 8.0||||F|||20170316150836||||
702M1XH00022<CR>

OBR|27|1703161652|1703161652|NEU%^NEU%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|NEU%^NEU%||40.2|%|||||F|||20170316150836||||702M1XH00022<CR>

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HORIBA||||||||F||||||ruleResult<CR>

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WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|HGB^HGB||143|g/dL|115.0 - 165.0||||F|||20170316150836||||
702M1XH00022<CR>

OBR|29|1703161652|1703161652|HCT^HCT^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|HCT^HCT||0.43299997|l/l|30.0 - 50.0||||F|||20170316150836||||
702M1XH00022<CR>

OBR|30|1703161652|1703161652|IMM#^IMM#^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

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WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|IMM#^IMM#||0.04|10\S\3/mm3|0.0 - 0.11||||F|||20170316150836||||
702M1XH00022<CR>

OBR|31|1703161652|1703161652|PCT^PCT^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|PCT^PCT||0.214|%|||||F|||20170316150836||||702M1XH00022<CR>

OBR|32|1703161652|1703161652|IMM%^IMM%^HALIA|||20170316123431||||||||DR
HORIBA||||||||F||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|NM|IMM%^IMM%||0.9|%|0.0 - 1.1||||F|||20170316150836||||702M1XH00022<CR>

OBR|33|1703161652|1703161652|RBC^RBC^HALIA|||20170316123431|||||||||DR HORIBA|||||||||F|||||||ruleResult<CR>

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TQ1|||||||20170316123431||R<CR>

OBX|1|NM|RBC^RBC||4.84|10\S\6/mm3|3.8 - 5.8||||F|||20170316150836|||| 702M1XH00022<CR>

OBR|34|1703161652|1703161652|MAC%^MAC%^HALIA|||20170316123431|||||||||DR HORIBA|||||||||F|||||||ruleResult<CR>

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TQ1|||||||20170316123431||R<CR>

OBX|1|NM|MAC%^MAC%||5.0|%|||||F|||20170316150836||||702M1XH00022<CR>

OBR|35|1703161652|1703161652|PLT^PLT^HALIA|||20170316123431|||||||||DR HORIBA|||||||||F|||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||| WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|PLT^PLT||229|10\S\3/mm3|150.0 - 400.0||||F|||20170316150836|||| 702M1XH00022<CR>

OBR|36|1703161652|1703161652|RDW-CV^RDW-CV^HALIA|||20170316123431|||||||||DR HORIBA|||||||||F|||||||ruleResult<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||20170316150847||||W00009|||||||| WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|NM|RDW-CV^RDW-CV||14.3|%|11.0 - 16.0||||F|||20170316150836|||| 702M1XH00022<CR>

OBR|37|1703161652|1703161652|WBC^WBC^HALIA|||20170316123431|||||||||DR HORIBA|||||||||F|||||||ruleResult<CR>

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TQ1|||||||20170316123431||R<CR>

OBX|1|NM|WBC^WBC||4.95|10\S\3/mm3|4.0 - 10.0||||F|||20170316150836|||| 702M1XH00022<CR>

NTE|1||WBC noise (DIFF)<CR>

NTE|2||WBC balance (DIFF/WBC)<CR>

NTE|3||WBC abnormal DIFF<CR>

OBR|38|1703161652|1703161652|RBC^^HALIA|||20170316123431|||||||||DR HORIBA|||||||||F|||||||<CR>

ORC|SC|1703161652|1703161652|1703161652|A||||||||W00009|||||||| WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

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OBR|39|1703161652|1703161652|PLT^^HALIA|||20170316123431||||||||DR HORIBA||||||||
F|||||||<CR>

ORC|SC|1703161652|1703161652|1703161652|A|||||||W00009|||||||
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TQ1||||||20170316123431||R<CR>

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OBR|40|1703161652|1703161652|BASO^^HALIA|||20170316123431||||||||DR
HORIBA||||||||F|||||||<CR>

ORC|SC|1703161652|1703161652|1703161652|A|||||||W00009|||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1||||||20170316123431||R<CR>

OBX|1|ED|BASO||
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OBR|41|1703161652|1703161652|LMNE^^HALIA|||20170316123431|||||||||DR
HORIBA|||||||||F|||||||<CR>

ORC|SC|1703161652|1703161652|1703161652|A|||||||W00009|||||||||
WARD00009^^^^^^^^^W00009<CR>

TQ1|||||||20170316123431||R<CR>

OBX|1|ED|LMNE||
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+NUv0EYFLdlOXNBIAATAFAZTrLEQACcIr6b2wEovoJwIy6kdV9AkAAdgDgxmSXABAAR
v/h/yUABKANAPbJK/KnNkZWHwjh/al
+AnBz2BDMVBycKBMAAtALgJooqIAKJgAEYPn6j4x/ujZFU/0EoCMAnYx3k064Xe/
NQQCWaYGuf4v9ONo9aQgAAeiufixTe9enva3ffgsmAkAARph/
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7G5M2ngAQgH2KhtHApn6EiwAQgEHlfxztRN8iY5vmHxoBIAA3KAZHOCNvIUwACEAzu
ZS16BTcN/v79zfwKwEgAFPbS79KE4jel/
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fv+vWkBfYMUJAAGY2vwbn/
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+2a9ouzQA6z6jYD0ABpQv8XsLjnyd9ocvb/
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Je3YgDA4wCp/oUBKKv/
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ZI7PtTh+l7SA2QZflDUx2EPaAHSst5ib9DQunPZGQDtTJI5aDLOwS4C9z/3GAmWcr/
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+f3HP9sCQJaWBMCdiZaDJluasR/QnAOu/IAoKAmM/9leKh
+j2uBQzIMXAyCrDSEr4gd0WXRvnGVWX7qhBzgUgKy+f0u9H/sKS9UfhGHyT9EP82X7k
+b/eu9v3/6B90nuQACWByAZ94OhX1zhibIBmoVyQx18/slASPsWAtEbGeCyGAD
+ORiNrpbIWipCYO5LMhsuC3WSfkAeh1o/CwB3GiBeTxpyOw/GSTDFw9W
+3I0hUPGn56NCbJb3AJYGT/sIF2Ym2fEWTOwqkH5g+yUMLIMeB0DQNXSdg/
Y8Iu1JdWUjvqA1COAnP6VAxxYbbxkHaGK/CcBKHuC6AYQ8h1zrDsDA/gRkBcDk
+6ZdGnjf6sstUWDAt3BRYWeDAEwHAG4UDaL/3K5me/1H6ySt7Mq2hP4BD5IB9+/
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+LJmz8raDo6LonmCBknbuIXdnVmThxoA8NK0fTbMtafb/0p/teCnoLiJ3UWUhCzpg1A+
+qtWCAq2cxygt9YnTYJIA1zWhMaydiD3q1+AAsGMZsKTyW6wGziyrAKVAfB6135JcBOt
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+mviH5w0261+0vCDKqclDy7uBgUYvFYwErd4gGm1bj/
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+rU0SW3dT1fM0aaqZPXtJO19NI6PhknAXazSv7CB0AcB4K0/3cq17o29Pb/e/my0/
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+O46QfBaCd3FUAsjQBypfJqAZo3d4x2mMk2HgjOt6QqxaAaFODNPNOoD3V/
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+vBacBuLFZyj0KCWj/TCbEreYDUOg3eABX1gwUOcYD+Cp30b/0A9dlGqs9UZVHf+J
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+9x9NeaKrMXCnl20lgV9ZMpbmP1ooPQywZAvm/
YgC0QAVsscwEAKlwJQA0+bN4AB8AXKXpaf6/
KoPi1BBb9GRh1DgLLHelzfgtUPdz5QD3AvC1w3n4aUAUBm082K7m4umRlbVL6p4AqP
UlzfDLLWA4LLcVov6uEJYQiLonANY0lFoDdT7h
+rW4cQjMe6xxEQAA6n6BHKAHANE0OhhcC2y/
7ICQDORGKV378AAANPmnAxBgIEMdn5DgSoDQk9FR9L32A7bquaUiNwyBXJUmMPB

Roy4Nv2ywkw5hcDdlKzBW6QYlAlUeIKjSYFseCFoqfIEB4Q4lAnBQEqzpO2ra77KgNXFU
Pw/w8dM3FOsOVaBKle/9TfBD2D8J1s/jKacQGM7+SQC4zJ4DeP/
paQmBTpA7Adg2BIoG
+skZWxQQAdhqTvD4L5gAcCEABIALASAAXA4EgEkwFwJAALgQAALAhTkAAeDStlGXL
7744ouv7V7/AgeEi/pk4v5AAAAAAElFTkSuQmCC|||N|||F|||20170316150836||||
702M1XH00022<CR>

<FS>

<CR>

2.3.5. LIS to Yumizen P8000 acknowledgment

<VT>

MSH|^~\&|^|^|YP8K|^|20160705120956||ACK|YP8K20160705100955|P|2.5|||||<CR>

MSA|AA|YP8K20160705100955<CR>

<FS>

<CR>

2.4. 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>.

2.5. 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 Export

3.1. QC Results Availability

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

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

The name of the user for the FTP server is **qc_P8000**. The password is **123456789**.

For each results export, two files will be available: one csv (or xml) and one sem (semaphore files).

The semaphore file will be present as soon as the csv (or xml) file will be ready to be downloaded by the external system.

As soon as the file has been downloaded, the external system will have to delete the csv (or xml) file and the semaphore file.

3.1.1. 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

3.1.2. 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="" instrumentid="" serialnumber="">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>

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