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MT 8000 Middleware Software LIS Protocol Description

Reference

Document No.	Description

Document issuing department: (Fill according to the following two descriptions.) 1. This column must be filled in for fixture, clamp, general, and reagent documents. 2. This column must be filled in for confidential and top confidential documents to be issued. Documents with other confidentiality can be delivered subject	**Customer Service**

to this requirement.	

revision history

Version	Protocol Version	Description of Modification	Revised by	Effective Date
1. 0	1. 0	New	Mei Daiwei	2023/09/08
2. 0	1. 0	1. Added the SPI protocol. 2. Enable OBR -23 automatic sample validation status (-AV passed, -UV not passed, others-blank) 3. Enable OBX -25 test in auto validation status (pass -AV, fail -UV, others-blank) 4. Enable OBX -26 test auto validation failure rule name (default delimiter for multi-rule name) 5. Revised the description of the OBR -18 field.	Mei Daiwei Rattling	2024/04/25
3. 0	2. 0	1. The field 6: Order operation type is added to the ORC. 2. Example of modifying OBR sample type field 3. Complete Message Format 4. The maximum recommended length of field 24 of OBX is deleted. 5. For the 2.0 protocol, add the following content based on 1.0: 1) OBR. Added (1) Field 33: Sample volume (SampleVolume) (2) Field 3 4: Sample volume unit (Unit) (3) Field 35: Hematocrit (HCT) 2) Field ResultTip is added to OBX and field ResultTip is added.	Zhang Xiaofei	2024/10/22
4. 0	3. 0	1. The confirmation code AS is added to the MSA field 1. Skip is selected. 2. This interface adds the type of OBR field 5 and the result status of field 25. 3. The OBX field 7 is supplemented with the	Tian Bo	2024/12/31

		test result range description. 4. The ORC field is added with the 4 inspection items and remarks. 5. Add the NTE protocol. 6. Updated Messages 7. The OBR field is updated. 15 Sample types are added. 8. Delete OBX field48 Maximum index limit 9. Added the transparent data transmission description.		
5. 0	4. 0&5.0	1. OBR adds field 36: Early setting probability (Clot) 1. Add SORTEND sorting completion in the ORC message for Order OperateType; 2. OBR adds field 30: Expert interpretation results （ Result Interpretation）; 3. Add a notification message stating that the critical value of the middleware issued by LIS has been processed 4. Example of a message modifying the error description above the OBX field 5. For more information about the delivery of the OBR sample protocol, see Appendix C. 6. Delete the special description of coagulation IDs in the third field of the OBX protocol and add detailed instructions for use. 7. Communication of supplementary sample data: Example of patient ward, example of serum image, and example of blood cell sample with graph 8. Supplemented two-way LIS sample inquiry response example 9. Remarks: The LIS is not required to reply to the ACK in the following messages: Sample on-board message, sample sign-off message, and sample position update message. 10. Appendix C: OBR -4 Message Type Coding Table and Remarks: OBX Figures are fixed in the 24th field.	Zhang Yanchao	

HL7 Communication Protocol

Overview

The middleware function provides the communication capability between the analyzer and the PC in laboratory through Ethernet, such as sending analysis results to and receiving worklist from lab PC.

This communication protocol is defined based on the HL7 standard. HL7 is an electronic data interchange standard in the medical field. It was originally defined by the US and has been adopted in many countries. This protocol is based on HL7 v2.3.1. For more information about HL7, refer to the HL7 Interface Standards Version 2.3.1.

Lower Transmission Layer Protocol

TCP communication.

HL7 Message Layer Protocol

HL7 Lower Layer Message Protocol

As an upper layer protocol, HL7 is based on messages and does not provide a message termination mechanism. To determine the message boundary, the MLLP underlying protocol (HL7 Interface Standards Version 2.3.1.) is used.).

Communication Layer

Messages are transmitted in the following format:
<SB> ddddd <EB><CR>
Where:

<SB> = Start Block character (1 byte)
ASCII <VT>, i.e. <0x0B>. Do not confuse with the SOH or STX in ASCII.

ddddd = Data (variable number of bytes)
Ddddd is the valid data of HL7 message, expressed in strings. Strings in HL7 communication messages use UTF -8 coding.

<EB> = End Block character (1 byte)
ASCII <FS>, <0x1C>. Do not confuse with ETX or EOT.

<CR> = Carriage Return (1 byte)
ASCII carriage return character, namely, <0x0D>.

Duplex communication

1. The middleware directly sends the analysis results (or QC data) to the LIS, as shown in. Figure Analysis Results And QC Data Communication Process1

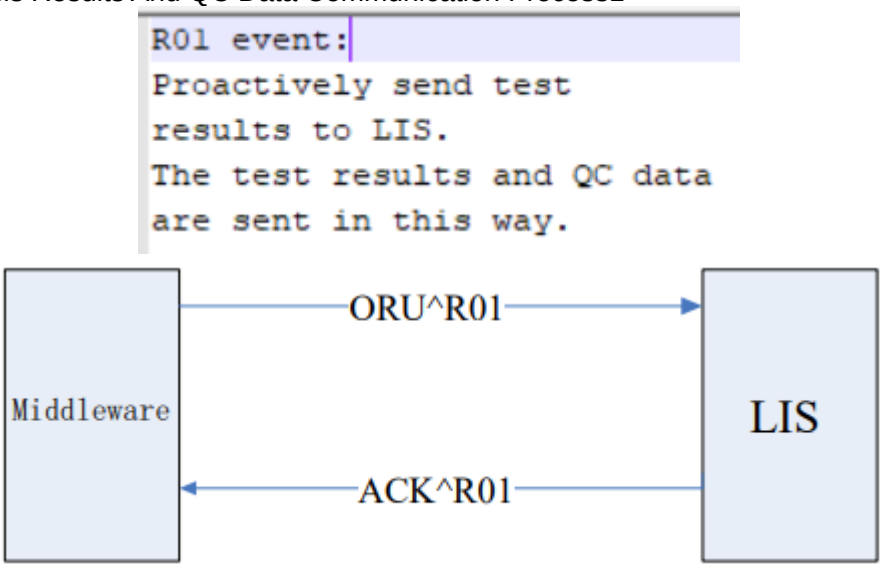

Figure Analysis Results And QC Data Communication Process1

2. Worklist information query.

The worksheet belongs to the Order information. The relevant HL7 messages: ORM (General Order Message), ORR (General Order Response Message) can be used. The communication process is shown in Figure 2.

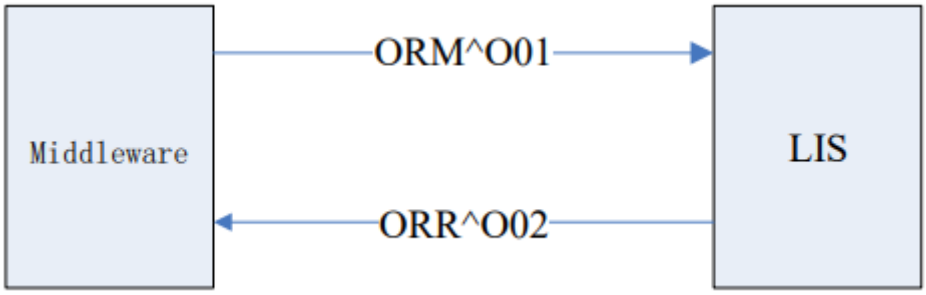

Figure Worklist Communication Process2

Messages

ORU^R01 message: Used for transmission of analysis results and QC data.

ORU Observational Results Unsolicited Description

MSH Message header, mandatory, including communication information such as message No., sending time, message separator, and coding method

{

PID Patient demographics, including patient name, gender, MRN, date of birth, etc.

[PV1] patient visit information, including patient type, department, bed No., fee, etc.

{

OBR Sample information, including sample bar code, tester, run date/time, etc.

[NTE]. Remarks

{

[OBX]. Test data, including test parameter results and test-related data such as Mode of operation

[NTE]. Remarks

}

}

}

ACK^R01 message: Confirms the received ORU^R01 message.

ACK Acknowledgment Description

MSH Message header

MSA Message acknowledgement, describing whether the communication message has been received successfully

ORM^O01 message: It is a general Order message. The Order-related actions use this message type, for example, to create a new order or cancel an order. Here, it is a request for the LIS to fill in the order message again.

ORM General Order Message Description

MSH Message header

{ORC} Order contains the ID of the sample.

QRF query and filtering, including condition intervals for querying samples

Message ORR^O02: Acknowledgement of message ORM^O01. Return the complete information of message order (i.e. worksheet). Cancel the test on message lis.

ORR^O02 General Order Response Message Description

MSH Message header

MSA Message acknowledgement

[PID patient demographics

[PV1]] Patient visit information

{
ORC General information of the Order, including sample bar code
[
OBR Sample Information
{[OBX]} Data items of other sample information, including sample Mode of operation, etc.
]
}

SCN ^0001 Sample Checkin Notify message: Sample loading notification
SCN^0001 Message Description:
MSH Message header
[CKI] On-board sample information data items, including sample bar code, on-board time, on-board instrument, and module

SSN^0002 Sample Sign Notify Message: LIS Sample Signing Notice
SSN^0002 Description:
MSH Message header
[CKI] Sign-in sample information data items, including sample bar code and sample id

SPN^0003 Sample Position Notify message: Sample position update notification
SPN^0003 Description:
MSH Message header
[SPI] sample position information data items, including sample barcode, sample IDs, device types, device SN, sample rack IDs, sample rack positions, partition names, update times, and positions inside the device

CPN^0004 (Sample Critical Processed Notify)Note: Critical value processed notification
CPN^0004 describe：
MSH header
CPI Critical value processing information
{OBX} LIS Processed critical value testing items

HL7 Segment Definitions

The fields contained in each segment are defined in detail in the following table. A row in the table corresponds to a field in the segment, and the meanings of each column in the table are as follows:

1、 No.: The HL7 message begins with the segment name of 3 characters followed by the fields which are separated by delimiters. "No." Refers to the order of the field in the HL7 message segment.

Example:

PID | 1 | |7393670^^^^MR||^Liu||19950804000000|F
↑ ↑ ↑
Segment name Field 1 Field 3

Message example - HL7 Field SN example **错误!文档中没有指定样式的文字。**1

Note: MSH segment is slightly different. The field delimiter following the segment name is considered to be the first field, used to define the field delimiter values of the whole message.

2、 Field name: Logical meaning of the field.
3、 Data type: HL7 standard type of the field
4、 Recommended max length: Recommended by HL7. However, the data length may exceed this value during actual message transmission. Therefore, the fields of the message should be read by delimiters when parsing the message.
5、 Description: Description of the value of the field.
6、 Example: Examples of fields.

MSH

The MSH (Message Header) segment contains basic information of HL7 messages, including delimiter value, message type and coding method. It is the first field of each HL7 message.

Message example:

```
MSH|^~\&|MiddleWare|Mindray|||20101012092538||ORU^R01|1|P|2.3.1|||||UNICODE
```

For field definitions used in MSH segment, see. Table MSH Field Definitions1

Table MSH Field Definitions1

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Field Delimiter	ST	1	Includes the delimiter of the first field after the segment name. It is used to define the field delimiter values of other parts of the message.	|
2	Encoding Characters	ST	4	Includes component delimiter, repetition delimiter, escape delimiter, and subcomponent delimiter.	^~\&
3	Sending application	EI	180	Application program at the sending end.	MiddleWare
4	Sending Facility	EI	180	Sending device. Value: Mindray	Mindray
7	Date/Time Of Message	TS	26	Message creation time (in the form of YYYY[MM[DD[HH[MM[SS]]]]]). Use the system time.	20101012092538
9	Message Type	CM	7	Message type, in the form of "Message type ^ Event type."	ORU^R01
10	Message Control ID	ST	20	Message control ID, used to uniquely identify a message	1
11	Processing ID	PT	3	Message processing ID Value: "P": Sample and worklist inquiry information; "Q" - QC count result; In the Ack message, it is consistent with the previously received message;	P
12	Version ID	VID	60	HL7 version number. Value: "2.3.1."	2.3. 1
15	Accept Acknowledgment Type	ID	2	Received response type, which is only valid for ORR^O02 messages. P indicates the sample information sent by the LIS host. Other values indicate the sample information of the LIS query and can be left blank.	
18	Character Set	ID	10	Character set. Value: "UNICODE," indicating that the communication message is expressed in UTF -8 coding string.	UNICODE

MSA

The MSA (Message Acknowledgement) segment contains message acknowledgement information.

Message example:

```
MSA|AA|1|Message accepted|||0
```

See for field definitions. Table MSA Field Definitions2

Table MSA Field Definitions2

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Acknowledgment Code	ID	2	Acknowledgement code: "AA" - received, "AE" - error, "AR" - rejected, "AS" - skipped.	AA
2	Message Control ID	ST	20	Message control ID, which is the same as the MSH -10 in the received message.	1
6	Error Condition	CE	100	Error condition (status code), which can be selected for transmission or contain error condition description. See Table 3 for values.	

Table Error Codes Of The MSA -6 Field3

Status Code (MSA -6)	Status Text (MSA -3)	Description/Remarks
Succeeded:		AA
0	Message accepted	Succeeded
Error Status Code:		AE
100	Segment sequence error	The segment sequence in the message is incorrect, or the required segment is lost.
101	Required field missing	Required field is lost in a segment
102	Data type error	The data type of the field is incorrect, for example, a digit is a character.
103	Table value not found	Table Value Not Found, Not Used Temporarily
Rejected status code:		AR
200	Unsupported message type	Message type not supported
201	Unsupported event code	Event code not supported
202	Unsupported processing id	Processing ID not supported
203	Unsupported version id	Version ID not supported
204	Unknown key identifier	Unknown keyword identifier, such as transmitting a non-existent patient demographics
205	Duplicate key identifier	Duplicate keywords already exist.
206	Application record locked	The transaction cannot be executed at the application storage level, for example, the database is locked.
207	Application internal error	Unknown internal application error
Skip:		AS

PID

The Patient Identification segment contains patient demographics.

Message example:

```
PID|1||C1^^^^MR||^Liu|| 20101005084346 |Male|||||||||||||||| Mild depression |||||
```

See for field definitions. Table PID Field Definitions4

Table PID Field Definitions4

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set ID - PID	SI	4	Serial number, used to identify different PID segments in a message	1
3	Patient Identifier List	CX	20	Used as patient ID^^^^MR in sample analysis result messages.	C1^^^^MR
5	Patient Name	XPN	48	Patient name (consists of FirstName and LastName), in the form of "LastName^First Name."	kang^Liu
7	Date/Time of Birth	TS	26	Used as time of birth in sample result messages. In the form of YYYY[MM[DD[HH[MM[SS]]]]].	20101005084346
8	Sex	IS	1	Gender, string. For male/female conversion to Male/Female transmission, other characters are the same as those displayed on the screen.	Male
26	Citizenship	ST	40	Patient Comment	Mild depression
31	MaxControl	ST	40	Maximum index control bit, fill in the blank	

PV1

PV1 (Patient Visit) contains the patient visit information.

Message example:

```
PV1|1|Outpatient|Medicine^^BN1|||||||||||||||||MedicalInsurance
```

See for field definitions. Table PV1 Field Definitions5

Table PV1 Field Definitions5

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set ID - PV1	SI	4	Serial number, used to identify different PV1 segments in a message.	1
2	Patient Class	IS	1	Patient Category: Outpatient = outpatient Hospitalize = inpatient Physical examination = healthCheck Others = Other	outpatient
3	Assigned Patient Location	PL	80	Patient location information, in the form of "Department ^ ^ Bed No."	Medicine^^BN1
20	Financial Class	FC	50	Fee type, blank, reserved.	MedicalInsurance

OBR

The OBR (Observation Request) segment contains the test report information.

Message example:

```
OBR|1||TestSampleID1|00001^Automated Count^99MRC|Y| 20101006084439 μl 20101009091515 μl 202211110
91515 ||Li|||Cold| 20101007084458 μl serum || dermatology |1^2^1^ 9527 || 1000 ||||HM||||ServiceUs
er| jaundice |||admin|||||||||||||||
```

Test Result of Patient Sample

When transmitting patient sample results, the fields used in the following fields of Mindray HL7 interface are defined in. Table OBR Field Definitions 6 field Definition

Table OBR Field Definitions 6

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set ID - OBR	SI	4	Serial number used to identify different OBR segments in a message.	1
2	Placer Order Number	EI	22	Used as sample bar code in response to worklist inquiry, that is, ORR^O02 message.	
3	Filler Order Number +	EI	22	Used as sample bar code in sample analysis result messages (i.e. ORU^R01 messages).	TestSampleID1
4	Universal Service ID	CE	200	Universal service identifier, used to identify different types of analysis results.	00001^Automated Count^99MRC
5	Priority	IS	2	STAT Y: STAT A: ASAP N: Routine	Y
6	Requested Date/time	TS	26	Program date. Used as the sampling time.	20101006084439
7	Observation Date/Time #	TS	26	Test time	20101009091515
8	Createtime Date/time	TS	26	Program Date/Time	20221111091515
10	Collector Identifier *	XCN	60	Sample collector. Here is used to indicate the ordering physician.	Li
13	Relevant Clinical Info.	ST	300	Relevant clinical information. Can be used as the clinical diagnosis information in the patient demographics.	Cold
14	Specimen Received Date/Time *	TS	26	Time of receiving samples Used as the time when the sample is sent for analysis.	20101007084458
15	Specimen Source *	CM	300	Sample type.	Serum plasma, urine, blood, CSF, pleural

					effusion, Other, Sample types listed in the dictionary For details, see the software interface: Dictionary -> sample type display
17	Order Callback Phone Number	XTN	40	Ordering Department	Dermatology
18	Placer Field 1	ST	60	Fill sample position information The format is as follows: Rack number or sample carousel number ^ On-carousel or on-rack position ^ Position type ^ Rack barcode Location type: 0 = Sample carousel 1 = Rack	1^2^1^9527
19	Placer Field 2	ST	60	Left blank	
20	Filler Field 1+	ST	60	This field is used as the sample ID.	1000
22	Results Rpt/Status Chng - Date/Time +	TS	26	Result Report/Status Change - Time. Used as review time.	
23	AutoAuditResult	ST	10	Auto Validation Result AV: Pass UV: Fail No auto validation result is delivered.	AV
24	Diagnostic Serv Sect ID	ID	10	ID of the diagnosis part. Value: "HM," meaning Hematology (hematology).	HM
25	Result Status +	XCN	150	Result Status Used here as audit mark Validated: Reviewed Not Validated: Not reviewed	
28	Result Copies To	XCN	150	Copy the result. Here is used to indicate sample reviewer.	ServiceUser
29	Remark	ST	300	Sample remarks, transmitted according to the screen display	Icterus
30	Result Interpretation	ST	600	Expert interpretation of the results. There is a line break (\n) in the string data used to break sentences.	PT reduction can be seen in the

					following situations: embolic diseases, hypercoagulable state, congenital factor V hyperplasia, etc.
32	Principal Result Interpreter +	CM	200	Main interpreter of results. Used as the tester in sample messages. Used as the operator of QC count.	admin
33	SampleVolume	NM	100	Sample Volume	81.4
34	Unit	ST	100	Sample Volume Unit	mL
35	HCT	ST	100	Hematocrit	67.57%
48	MaxControl	ST	106	Maximum index control bit, fill in the blank.	

Note: When the fourth field is filled with the 00012^QC Count^99MRC of non-hematology control (biochemistry, immunoassay, and coagulation), For details, see Appendix C OBR -4 Message Type Coding List.

the OBR -1 QC result protocol is used; otherwise, the OBR patient sample result is used.

OBR -1 QC test results

If the QC results are transmitted, The fields are defined as follows:

No.	Field name	Data Type	Recommended Max Length	Description
1	Set ID – OBR	SI	10	Identify different OBR fields
2	Placer Order Number	EI	10	Order number of the requestor, used as the channel number of the item
3	Filler Order Number	EI	15	Executor order number, used as abbreviation name of chemistry
4#	Universal Service ID	CE	200	Universal service identifier, used to identify different types of analysis results. For specific values, see. 0
5	Priority	ID	2	Priority: Used for sample type; 0: Serum; 1: Plasma; 2: Urine; 3: Cerebrospinal fluid; 4: Other; 5: Whole blood.
6	Requested Date/time	TS	26	Request time/date, used as the start time of essential control
7	Observation Date/Time	TS	26	Observation date/time, used as the QC program time
8	Observation End Date/Time	TS	26	Observe the end date/time and test completion time.
10	Collector Identifier	XCN	60	Left blank.
11	Specimen Action Code	ID	1	Number of controls. The default is 1.
12	Danger Code	CE	10	Control No.
13	Relevant Clinical Info.	ST	15	Control Name

No.	Field name	Data Type	Recommended Max Length	Description
14	Specimen Received Date/Time	TS	18	Lot No.
15	Specimen Source	CM	26	Expiration date of control. Format: Yyyymmdd
16	Ordering Provider	XCN	1	Fixed to 0
17	Order Callback Phone Number	XTN	1	Control concentration level. High -H Medium -M Low -L
18	Placer Field 1	ST	8	Mean (mean concentration)
19	Placer Field 2	ST	8	Standard deviation
20	Filler Field 1	ST	25	Test Result (Concentration)
21	Filler Field 2	ST	20	Unit
22	Test Result Flag	ST	512	Result flag
23	Instrument Name	ST	120	Instrument Name
24	Module Name	ST	120	Module Name
25	Reagent Information	ST	320	Reagent batch number and reagent bottle number The single reagent format is as follows: Reagent Batch No.:: reagent Bottle No.: The multi-reagent format is as follows: Reagent Batch No.:: reagent Bottle No.: # reagent Batch No.:: reagent Bottle No.:
26	RespValue	NM	200	Response
27	Quantity/Timing	ST	200	Left blank. Quantity/Time
28	Result Copies To	ST	150	Left blank. Result CC
29	Parent	ST	150	Left blank. Parent doctor's advice
30	Transportation Mode	ST	1	Chemistry type identifier. Input blank for calculations and 1 for non-calculations.
48	MaxControl	ST	106	Maximum index control bit, fill in the blank.

OBX

The OBX (Observation/Result) segment is used to transmit observation information (chemistry parameters, age, and patient area) in report messages. A patient may have more than one OBX. This interface does not provide the repeatability test on the test data, and the customer system processes the data on its own.

Message example:

```
OBX|2|NM|^APTT/Sec^99MRC^aptt-sec||10.00|Sec|24.00-38.00||||F
```

See for field definitions. Table OBX Field Definitions7

Table OBX Field Definitions7

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set ID - OBX	SI	10	Serial number, used to identify different OBX segments in a message.	8
2	Value Type	ID	3	Test result data type. Value: "ST," "NM," "ED," "IS," e	NM

				tc. See Appendix B for details. 0	
3#	Observation Identifier	CE	590	Inspection item identifier. In the form of "ID^Name^EncodeSys^ChannelNo"; Id represents the test item identifier; Name represents the test item description; EncodeSys represents the test item coding system; ChannelNo represents the channel number. Note: IDs and EncodeSys are used to define only one extended attribute result, and channel IDs are used to define only one analysis parameter. Names are intended for description rather than identification. If the ID is null, "^" is divided into four fields, and the channel number in the fourth field is used to identify test items. If the ID is not null, the ID is divided into three fields and the channel ID is null. The values are obtained based on the ID and EncodeSys in Appendix C. Use the fixed value SerQuality or BufferCoat when transferring sample images.	^APTT/Sec^99MRC^aptt-sec or 30525 -0 ^Age^LN SerQuality is used to transmit serum images. BufferCoat is used to transmit RBU buffy coat images.
4	Observation Sub-ID	ST	20	Chemistry	Ca
5	Observation Value	*	65535	Interface Observed Value	>2.20
6	Units	CE	60	Inspection item unit Expressed in standard units defined in HL7.	Sec
7	References Range	ST	60	Reference range, in the form of "low limit-high limit," "< high limit," or "> low limit." There are two reference ranges for the review results: 1. High and low reference ranges. For the parameters using the high and low reference ranges, see Table 34 in Appendix C, in the form of "reference range lower limit - reference range upper limit," "< reference range upper limit," or "> reference range lower limit." 2. Negative reference range: The negative reference r	4.00-10.00

				ange is used for all parameters except the high and low reference ranges. For example,: Is smaller than the negative reference range high limit or <= is smaller than the negative reference range high limit.	
8	Abnormal Flags	ID	512	Test Result Flag The field is connected by flags such as "H, A."	L,A
9	Probability	NM	5	Possibility. It is used as the qualitative test result value (negative, positive, +-, etc.) or optimized value. If the two values exist at the same time, it is used as the qualitative test result value.	+
11	Observ Result Status	ID	1	Analysis result status. The fixed value is "F" - (Final Result), indicating the final result.	F
12	ResultTip	ST	100	Result Prompt	DD/FDP hemolysis is too strong.
13	User Defined Access Checks	ST	20	Transmit the original result value. If the result is modified, the modified result value will be transmitted.	
14	Date/Time of the Observation	TS	26	Date/Time Send sample test information: Fill the test completion time. Sending sample connection information: Filling connection time	20221111091515
16	Responsible Observer	XCN	80	Observer and tester.	Iron column
17	Observation Method	CE	60	Rerun result flag: 1 – Rerun Results 0 – Non-rerun Results CPN^0004 Message: This field represents whether the test item has been rechecked and can be empty。 1 – rerun 0 – Non-rerun	1
19	Instrument	ST	120	Instrument Name	BS-2800M
20	Module Name	ST	120	Module Name	M1
21	Reagent Inf	ST	320	Reagent batch number and	s111:5

	ormation			reagent bottle number The single reagent format is as follows: Reagent Batch No.:: reagent Bottle No.: The multi-reagent format is as follows: Reagent Batch No.:: reagent Bottle No.: # reagent Batch No.:: reagent Bottle No.:	
22	RespValue	ST	320	Test value. Fill routine test response	6. 0
23	DilutionFactor	ST	120	Dilution factor. The calculation is fixed to 1.	
24	Image Data	ST		String (Binary data such as pictures are converted using the Base64 coding method. For the coding method, see Appendix D.	
25	AutoAuditResult	ST	10	Auto Validation Result AV: Pass UV: Fail No auto validation result is delivered.	UV
26	AutoAuditMessages	ST	120	The name of the failed rule, the content displayed on the screen. The names of multiple rules are separated by "^."	Result out of range ^ Logic relationship error

Remarks:

If the 5th field is invalid, refer to the result of the 9th field.

The channel number of the third field is: Serum image uses SerQuality, RBU buffy coat image uses BufferCoat, and the value of the 24th field is used.

The third field is preferably matched by channel ID. If a channel ID is blank, it is matched by combination of ID and EncodeSys.

Binary data such as hematology histograms and scatter diagram are stored in the No. 24 field.

When the third field is filled with Alarm i-Message, the OBX -5 field is filled with the result value and the OBX -7 field is filled with the threshold.

The fourth field hematolgy item is empty.

The OBX segment carries the age and is filled with the following fields:

OBX -2: Analysis result data type

OBX-3 30525-0^Age^LN

OBX -5 Age Value

OBX -6 Age unit type

OBX -11: Test result status

The OBX segment carries the ward and is filled with the following fields:

OBX -2: Analysis result data type

OBX-3 01008^Patient Area^99MRC

OBX -5 patient area

OBX -11: Test result status

QRF

In paragraph QRF (Query Filter Segment), the original query content is further refined.

The QRF segment of Mindray HL7 interface uses the following fields.

No.	Field		Length	Description
1#	Where Subject Filter	ST	20	Left blank. Filter mark of the location of the inquirer. Obtain the equipment model.
2	When Data Start Date/Time	TS	26	Record the start date/time, which is used as the start time for receiving samples during query.
3	When Data End Date/Time	TS	26	Record the end date/time and use it as the end of the sample receiving time during query.
4	What User Qualifier	ST	10	Start ID, string
5	Other QRY Subject Filter	ST	10	End sample ID, character string. When a single sample is queried, the ID is the same as the start ID.
6	Which Date/Time Qualifier	ID	12	Target type, fixed value RCT (Specimen receipt date/time, receipt of specimen in filling ancillary, Lab)
7	Which Date/Time Status Qualifier	ID	12	Target status, taking fixed value COR (Corrected only in no final with corrections)
8	Date/Time Selection Qualifier	ID	12	Date/time selection qualifier, fixed value ALL (All values within the range)
9	When Quantity/Timing Qualifier	TQ	60	Left blank. Time interval
10	MaxControl	ST	40	Maximum index control value bit, blank

Note: Field 2 and field 3 indicate the zero point of the day and the time when the query occurs, which are used as the query interval conditions. All fields are of string type. Field 4 and 5 indicate the start ID and end ID of the sample respectively, which can be inquired by ID interval. When field 4 is blank, it indicates using time; when field 4 is not blank, it indicates recalling by sample ID.

ORC

The ORC (Common Order) segment contains the general information of Order.

Message example:

ORC|RF||SampleID||IP

For field definitions, see. Table 8 ORC Field Definitions

Table 8 ORC Field Definitions

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Order Control	ID	2	Order control word. In ORM message, the value is "RF," which means "fill in	RF

				the order request again." In ORR message, the value is "AF," which means" order refill confirmation ."	
2	Placer Order Number	EI	22	Sample bar code of Order. In ORM message, the value is null. In ORR message, the value is the sample bar code.	
3	Filler OrderNum	EI	22	In ORM message, the value is the sample bar code. In ORR message, the value is null.	9527
4	Placer group number	ST	22	Order request No. This item is used for inspection.	BL BF
5	Order Status	ID	2	Order status. In worklist information inquiry communication, the value in the ORM message is "IP," which means "Order is processing, but has not got the result"; The value in the ORR message is null;	IP
6	Order OperateType	ID	2	Identifiers for creation, cancellation, and change (NW= creation; CA= is canceled; XO= changed; SORTEND= soter complete)	NW (NW if not filled)

Note: When the first field is "RF," only the first 5 fields are used. When the first field is AF, only the first 5 fields can be filled. When the test is canceled, the sixth field needs to be filled.

Fill in BL or BF in the fourth field.

CKI

CKI (Check-in) segment mainly includes sample receipt information.

Message example:

```
CKI|1|9527-66|20101006084439|2800M| Chem-31415926| M1|5^2|
```

See Table 9 for field definitions.

Table 9 CKI Field Definitions

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set-ID	SI	4	Serial number, used to identify different CKI segments in the message.	1
2	Identifier	EI	22	Inspection identifier, used as barcode	9527-66
3	Checkin Time	TS	26	Time of Receipt	20101006084439
4	Analyzer	ST	120	Instrument Name	2800M

	Name				
5	ModuleSerialNo	ST	120	Module SN	Chem-31415926
6	Module Name	ST	120	Module Name	M1
7	Position	ST	26	Sample position information, format: Position on carousel or rack ^ Position type	5^2
8	Sequence ID	EI	22	Sample ID	Chem-123

SPI

The SPI (Sample Position Info) segment mainly contains the sample position information..

Message example:

```
SPI|1| 9527 -66 |Chem -123 |IO^1^N0001^1| 20240308091515 |1^3^1|
```

See Table 10 for field definitions.

Table SPI Field Definitions 10

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set-ID	SI	4	Message No.	1
2	Identifier	EI	22	Barcode	9527-66
3	Sequence ID	EI	22	Sample ID	Chem-123
4	SamplePosition	ST	60	Fill sample position information Detailed Position Equipment number, serial number, rack number, and position The sequence number is generated according to the sequence number sorting in the processing line layout.	IO^1^N0001^1 SDM^1^N0001^1 FRIDGE^1^N0001^1
5	AreaName	ST	120	Partition Name (currently only supported by IO)	Senior Management Archive
6	UpdateTime	TS	26	Update Time	20240308091515
7	RackPosition	ST	60	Positions of sample racks inside the instrument Sequence number ^ Horizontal sequence number ^ Vertical sequence number How many layers are marked in the refrigerator from top to bottom? The IO/SDM is fixed to 1 Horizontal SN: From left to right Vertical No.: Top to bottom	1^3^1

15	**MaxControl**	**ST**	**106**	**Maximum index control bit, fill in the blank.**	

NTE

The NTE Notes And Comments segment contains comments.

Message example:

NTE|9|P|This is comment.|GR

See for field definitions. Table 11 NTE Field Definitions

Table 11 NTE Field Definitions

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set ID – NTE	SI	4	Serial number, used to identify different NTE segments in a message	9
2	Source of comment	ID	8	Source of remarks. There are 3 options in total, including: L: Ancillary filler department is source of comment P: Orderer placer is source of comment. O: Other system is source of comment. The reading result is filled with P permanently.	P
3	Comment	FT	64K	Comments.	This is comment.
5	Comment Type	CE	60	There are 8 types of remarks, including: PI: Patient Instructions. AI: Ancillary Instructions. GI: General Instructions. 1R: Primary Reason. 2R: Secondary Reason GR: General Reason. RE: Remark. DR: Duplicate/Interaction Reason. GR is always filled in the reading result.	GR

CPI

CPI（Critical Processed Info）The message segment mainly contains information on handling critical values.

Message Example：

CPI|1|9527-66|Chem-123|ZHANG|20250120093215|LIU|189xxxx6220| The crisis value of the test has been processed |

See for field definitions. Table 11 NTE Field Definitions

Table 12 CPI Field Definitions

No.	Field name	Data Type	Recommended Max Length	Description	Example
1	Set ID	SI	4	Serial number	1
2	Identifier	EI	22	Barcode	9527-66
3	Sequence ID	EI	22	Sample ID	Chem-123
4	Notifier	ST	20	Notify person, can be empty	ZHANG
5	Notify Time	TS	26	Notification time, can be empty	20250120093215
6	Recipient	ST	20	Recipient, can be empty	LIU
7	Recipient Phone	ST	20	Receiver's phone number, can be empty	189xxx12312
8	Remark	ST	300	The remark information for handling critical values on LIS can be empty	The crisis value of the test has been processed

Complete Message Example

1. Sample Data Communication Process

Biochemistry, Immunology, and Coagulation Samples

Sample Result Message

MSH|^~\&| MiddleWare |Mindray|||20141114104119||ORU^R01|5|P|2.3.1|||||UNICODE
PID|1||no123^^^^MR||^name||20090105|Male
PV1|1||dept^^b102|||||||||||||||charge
OBR|1||1|00001^Automated
Count^99MRC|||20141113195229|||sender|||ganmao|20140811|||||1000||20141114104032||HM||||Admin||||Admin
OBX|1|NM|30525-0^Age^LN||5|yr|||||F
OBX|2|IS|01008^Patient Area^99MRC||A - 501|||||F
OBX|3|NM|^APTT/Sec^ 99MRC^aptt-sec||10.00|Sec|24.00-38.00||||F
OBX|4|NM|^PT/INR^99MRC^pt-inr ||0.50|INR|0.75-1.35||||F
OBX|5|ED|SerQuality|||||||||||||||||||/9j/4AAQSkZJRgABAQAAAQ……

Sample Response Message

In synchronous communication of middleware, each sample result needs a response message. The sample response message contains two segments: MSH and MSA. Note: The content of the MSH -9 field needs to be filled with ACK^R01, indicating that the message is a sample response message. If the value of the MSA1 field is the same as the value of the MSH -10 field of the received counting result, it indicates that the response message corresponds to the sent counting result. In this example, the value of the MSA2 field is 1.

MSH|^~\&|LIS||||20130424095049||ACK^R01|1|P|2.3.1|||||UNICODE

MSA|AA|1

Hematology sample example:

MSH|^~\&|MiddleWare|Mindray|||20250117152409||ORU^R01|11|P|2.3.1|||||UNICODE

PID|1|| 340181197005 ^^^^MR||^ Liu Jianjun || 19000808000000 ||||||||||||||||||||

PV1|1|Physical examination| cardiopulmonary ^^ 631 HXO||||||||||||||||

OBR|1||xqxq01|00001^Automated Count^99MRC|N| 20250116092130 μ g 20250116140317 μ g 20250116140317 || Panping ||| thrombocytopenia μ g 20250116095131 μ g whole blood || cardiopulmonary |4^10^1^4||15|| 20250117152408 ||HM|NotValidated|||ServiceUser| influenza A |||admin||||||||||||||

OBX|1|NM|30525-0^Age^LN||124|yr|||||F

OBX|2|ST|01008^Patient Area^99MRC|| T Block, Liupanshui Street ||||||F

OBX|3|IS|08001^Take Mode^99MRC||A||||||F

OBX|4|IS|08002^Blood Mode^99MRC||M||||||F

OBX|5|IS|08003^Test Mode^99MRC||CBC+DIFF||||||F

OBX|6|IS|01002^Ref Group^99MRC|| General ||||||F

OBX|7|IS|05007^Project Type^99MRC||BL||||||F

OBX|8|ST|09001^Analyzer^99MRC||BC-6800PlusV1||||||F

OBX|9|ST|09999^AuditResult^99MRC||Review||||||F

OBX|10|ST|09997^AuditMessages^99MRC|||||||F

OBX|11|ST|09003^SN^99MRC||BC-6800PlusV1||||||F

OBX|12|ST|09996^SpecialistMessages^99MRC|| indicates possible influenza A? ||||||F

OBX|13|IS|01006^Recheck flag^99MRC|||||||F

OBX|14|IS|12010^Basophilia^99MRC||T||||||F

OBX|15|IS|15192-8^Atypical Lymphs?^LN||T||||||F

OBX|16|IS|10379-6^RBC Dual Pop^LN||T||||||F

OBX|17|IS|12018^Thrombopenia^99MRC||T||||||F

OBX|18|IS|12069^PLT Abn Scattergram^99MRC||T||||||F

OBX|19|IS|12070^Platelets.Large^99MRC||T||||||F

OBX|20|IS|12103^WNB Abn Scattergram^99MRC||T||||||F

OBX|21|IS|12104^WBC Fragments?^99MRC||T||||||F

OBX|22|NM|34525-6-IM^rstRBC-IM^LN||32||40||||F

OBX|23|NM|44017-2-IM^Blasts-IM^LN||30||40||||F

OBX|24|NM|12053-IM^Abn Lympho/ Blasts-IM^99MRC||33||40||||F

OBX|25|NM|34165-1-IM^Imm Granulocytes?-IM^LN||31||40||||F

OBX|26|NM|15192-8-IM^Atypical Lymphs?-IM^LN||38||40||||F

OBX|27|NM|17790-7-IM^WBC Left Shift?-IM^LN||37||40||||F

OBX|28|NM|12104-IM^WBC Fragments?-IM^99MRC||43||40||||F

OBX|29|NM|12055-IM^Lipid Particles?-IM^99MRC||42||40||||F

OBX|30|NM|12015-IM^HGB Interfere-IM^99MRC||34||40||||F

OBX|31|NM|50670-9-IM^RBC Agglutination?-IM^LN||39||40||||F

OBX|32|NM|12063-IM^Fragments-IM^99MRC||35||40||||F

OBX|33|NM|12056-IM^Infected RBC?-IM^99MRC||36||40||||F

OBX|34|NM|12024-IM^Iron Deficiency-IM^99MRC||40||40||||F

OBX|35|NM|7796-6-IM^Platelet Clump?-IM^LN||41||40||||F

OBX|36|NM|789-8^RBC^LN||5.21|10*12/L|3.50-5.50|N|||F||5.21|||^^|||BC-6800PlusV1

OBX|37|NM|718-7^HGB^LN||15|g/L|110-160|L,N|||F||15|||^^|||BC-6800PlusV1

OBX|38|NM|4544-3^HCT^LN||37.9|%|37.0-54.0|N|||F||37.9|||^^|||BC-6800PlusV1

OBX|39|NM|787-2^MCV^LN||78.6|fL|80.0-100.0|L,N|||F||78.6|||^^|||BC-6800PlusV1

OBX|40|NM|785-6^MCH^LN||3.5|pg|27.0-34.0|L,N|||F||3.5|||^^|||BC-6800PlusV1

OBX|41|NM|786-4^MCHC^LN||34|g/L|320-360|L,N|||F||34|||^^|||BC-6800PlusV1

OBX|42|NM|21000-5^RDW-SD^LN||45.7|fL|35.0-56.0|N|||F||45.7|||^^|||BC-6800PlusV1

OBX|43|NM|788-0^RDW-CV^LN||14.3|%|11.0-16.0|N|||F||14.3|||^^|||BC-6800PlusV1

OBX|44|NM|777-3^PLT^LN||190|10*9/L|100-300|N|||F||190|||^^|||BC-6800PlusV1

OBX|45|NM|17109^PLT-H^99MRC||128|10*9/L|128-128|N|||F||128|||^^|||BC-6800PlusV1

OBX|46|NM|32623-1^MPV^LN||6.1|fL|6.5-12.0|L,N|||F||6.1|||^^|||BC-6800PlusV1

OBX|47|NM|32207-3^PDW^LN||16.5||15.0-17.0|N|||F||16.5|||^^|||BC-6800PlusV1

OBX|48|NM|10014^PLCR^99MRC||6.0|%|11.0-45.0|L,N|||F||6.0|||^^|||BC-6800PlusV1

OBX|49|NM|10013^PLCC^99MRC||7|10*9/L|30-90|L,N|||F||7|||^^|||BC-6800PlusV1

OBX|50|NM|10002^PCT^99MRC||0.210|%|0.108-0.282|N|||F||0.210|||^^|||BC-6800PlusV1

OBX|51|NM|751-8^NEU#^LN||5.16|10*9/L|2.00-7.00|N|||F||5.16|||^^|||BC-6800PlusV1

OBX|52|NM|731-0^LYM#^LN||1.89|10*9/L|0.80-4.00|N|||F||1.89|||^^|||BC-6800PlusV1

OBX|53|NM|742-7^MON#^LN||0.22|10*9/L|0.12-1.20|N|||F||0.22|||^^|||BC-6800PlusV1

OBX|54|NM|711-2^EOS#^LN||0.04|10*9/L|0.02-0.50|N|||F||0.04|||^^|||BC-6800PlusV1

OBX|55|NM|770-8^NEU%^LN||59.9|%|50.0-70.0|N|||F||59.9|||^^|||BC-6800PlusV1

OBX|56|NM|736-9^LYM%^LN||28.5|%|20.0-40.0|N|||F||28.5|||^^|||BC-6800PlusV1

OBX|57|NM|5905-5^MON%^LN||6.0|%|3.0-12.0|N|||F||6.0|||^^|||BC-6800PlusV1

OBX|58|NM|713-8^EOS%^LN||0.7|%|0.5-5.0|N|||F||0.7|||^^|||BC-6800PlusV1

OBX|59|NM|6690-2^WBC^LN||3.65|10*9/L|4.00-10.00|L,N|||F||3.65|||^^|||BC-6800PlusV1

OBX|60|NM|704-7^BAS#^LN||0.01|10*9/L|0.00-0.10|N|||F||0.01|||^^|||BC-6800PlusV1

OBX|61|NM|706-2^BAS%^LN||0.4|%|0.0-1.0|N|||F||0.4|||^^|||BC-6800PlusV1

OBX|62|NM|30392-5^NRBC#^LN||4.280|10*9/L|0.000-9999.999|N|||F||4.280|||^^|||BC-6800PlusV1

OBX|63|NM|26461-4^NRBC%^LN||10.14|/100WBC|0.00-9999.99|N|||F||10.14|||^^|||BC-6800PlusV1

OBX|64|NM|51584-1^IMG#^LN||0.08|10*9/L|0.00-999.99|N|||F||0.08|||^^|||BC-6800PlusV1

OBX|65|NM|38518-7^IMG%^LN||0.1|%|0.0-100.0|N|||F||0.1|||^^|||BC-6800PlusV1

OBX|66|NM|17125^HYPO-CH%^99MRC||47.8|%|47.8-47.8|N|||F||47.8|||^^|||BC-6800PlusV1

OBX|67|NM|17126^HYPER-CH%^99MRC||60.6|%|60.6-60.6|N|||F||60.6|||^^|||BC-6800PlusV1

OBX|68|NM|17123^MCHm^99MRC||150.1|pg|150.1-150.1|N|||F||150.1|||^^|||BC-6800PlusV1

OBX|69|NM|10022^PLT-I^99MRC||6|10*9/L||N|||F||6|||^^|||BC-6800PlusV1

OBX|70|NM|10024^WBC-D^99MRC||14.56|10*9/L||N|||F||14.56|||^^|||BC-6800PlusV1

OBX|71|NM|10052^TNC-D^99MRC||24.08|10*9/L||N|||F||24.08|||^^|||BC-6800PlusV1

OBX|72|NM|10026^WBC-N^99MRC||7.03|10*9/L||N|||F||7.03|||^^|||BC-6800PlusV1

OBX|73|NM|10025^WBC-B^99MRC||77.13|10*9/L||N|||F||77.13|||^^|||BC-6800PlusV1

OBX|74|NM|10059^TNC-N^99MRC||46.26|10*9/L||N|||F||46.26|||^^|||BC-6800PlusV1

OBX|75|NM|10020^HFC#^99MRC||13.94|10*9/L||N|||F||13.94|||^^|||BC-6800PlusV1

OBX|76|NM|10021^HFC%^99MRC||36.1|%||N|||F||36.1|||^^|||BC-6800PlusV1

OBX|77|NM|10053^IME#^99MRC||8.92|10*9/L||N|||F||8.92|||^^|||BC-6800PlusV1

OBX|78|NM|10054^IME%^99MRC||17.4|%||N|||F||17.4|||^^|||BC-6800PlusV1

OBX|79|NM|10055^H-NR%^99MRC||21.2|%||N|||F||21.2|||^^|||BC-6800PlusV1

OBX|80|NM|10056^L-NR%^99MRC||26.0|%||N|||F||26.0|||^^|||BC-6800PlusV1

OBX|81|NM|10057^NLR^99MRC||12.48|||N|||F||12.48|||^^|||BC-6800PlusV1

OBX|82|NM|10058^PLR^99MRC||13.44|||N|||F||13.44|||^^|||BC-6800PlusV1

OBX|83|NM|10032^InR#^99MRC||2.05|10*9/L||N|||F||2.05|||^^|||BC-6800PlusV1

OBX|84|NM|10033^InR‰^99MRC||38.84|‰||N|||F||38.84|||^^|||BC-6800PlusV1

OBX|85|NM|15199-3^Micro#^LN||34.96|10*12/L||N|||F||34.96|||^^|||BC-6800PlusV1

OBX|86|NM|10042^Micro%^99MRC||12.5|%||N|||F||12.5|||^^|||BC-6800PlusV1

OBX|87|NM|15198-5^Macro#^LN||37.16|10*12/L||N|||F||37.16|||^^|||BC-6800PlusV1

OBX|88|NM|10040^Macro%^99MRC||52.1|%||N|||F||52.1|||^^|||BC-6800PlusV1

OBX|89|NM|10031^PDW-SD^99MRC||54.0|fL||N|||F||54.0|||^^|||BC-6800PlusV1

OBX|90|NM|10069^Neu-X^99MRC||42.4|||N|||F||42.4|||^^|||BC-6800PlusV1

OBX|91|NM|10070^Neu-Y^99MRC||50.1|||N|||F||50.1|||^^|||BC-6800PlusV1

OBX|92|NM|10071^Neu-Z^99MRC||18.3|||N|||F||18.3|||^^|||BC-6800PlusV1

OBX|93|NM|10072^Lym-X^99MRC||13.2|||N|||F||13.2|||^^|||BC-6800PlusV1

OBX|94|NM|10073^Lym-Y^99MRC||44.4|||N|||F||44.4|||^^|||BC-6800PlusV1

OBX|95|NM|10074^Lym-Z^99MRC||93.8|||N|||F||93.8|||^^|||BC-6800PlusV1

OBX|96|NM|10075^Mon-X^99MRC||82.7|||N|||F||82.7|||^^|||BC-6800PlusV1

OBX|97|NM|10076^Mon-Y^99MRC||61.6|||N|||F||61.6|||^^|||BC-6800PlusV1

OBX|98|NM|10077^Mon-Z^99MRC||50.8|||N|||F||50.8|||^^|||BC-6800PlusV1

OBX|99|NM|10078^SRBC^99MRC||0.87|10*12/L||N|||F||0.87|||^^|||BC-6800PlusV1

OBX|100|NM|10079^LRBC^99MRC||41.82|10*12/L||N|||F||41.82|||^^|||BC-6800PlusV1

OBX|101|NM|10080^SMCV^99MRC||102.8|fL||N|||F||102.8|||^^|||BC-6800PlusV1

OBX|102|NM|10081^LMCV^99MRC||98.2|fL||N|||F||98.2|||^^|||BC-6800PlusV1

OBX|103|NM|17128^HF-MCV^99MRC||1.8|fL||N|||F||1.8|||^^|||BC-6800PlusV1

OBX|104|NM|10089^TNC-B^99MRC||56.67|10*9/L||N|||F||56.67|||^^|||BC-6800PlusV1

OBX|105|NM|17110^IPF-D^99MRC||95.3|%||N|||F||95.3|||^^|||BC-6800PlusV1

OBX|106|NM|17111-2^RET#-D^99MRC||22.5980|10*12/L||N|||F||22.5980|||^^|||BC-6800PlusV1

OBX|107|NM|17111-1^RET%-D^99MRC||102.10|%||N|||F||102.10|||^^|||BC-6800PlusV1

OBX|108|NM|17112^IRF-D^99MRC||20.7|%||N|||F||20.7|||^^|||BC-6800PlusV1

OBX|109|NM|17113^LFR-D^99MRC||44.3|%||N|||F||44.3|||^^|||BC-6800PlusV1

OBX|110|NM|17114^MFR-D^99MRC||74.7|%||N|||F||74.7|||^^|||BC-6800PlusV1

OBX|111|NM|17115^HFR-D^99MRC||25.6|%||N|||F||25.6|||^^|||BC-6800PlusV1

OBX|112|NM|17137-1^HF-LYM#^99MRC||68.868|10*9/L||N|||F||68.868|||^^|||BC-6800PlusV1

OBX|113|NM|17137-2^HF-LYM%^99MRC||56.5|%||N|||F||56.5|||^^|||BC-6800PlusV1

OBX|114|NM|17138-1^UHF-LYM#^99MRC||88.011|10*9/L||N|||F||88.011|||^^|||BC-6800PlusV1

OBX|115|NM|17138-2^UHF-LYM%^99MRC||43.7|%||N|||F||43.7|||^^|||BC-6800PlusV1

OBX|116|NM|16300^MND^99MRC||24.76|||N|||F||24.76|||^^|||BC-6800PlusV1

OBX|117|NM|12227-5^CORRECTED WBC^LN||3.65|10*9/L|4.00-10.00|L,N|||F||3.65|||^^|||BC-6800PlusV1

OBX|118|NM|10098-CustomP^CustomP^99CUS||10.3200|10*9/L|1.1000-3.3000|H|||F||10.3200|||^^|||BC-6800 PlusV1

OBX|119|ED|15200^WBC DIFF Scattergram.

BMP^99MRC|||||||F||||||||||||Qk3GXAAAAAAAALYDAAAoAAAAlgAAAJYAAAABAAgAAAAAAAAAAA

DEDgAAxA4AAOAAAADgAAAAA/19fXAP8=.....

OBX|120|ED|15116^PLT Histogram.

BMP^99MRC|||||||F||||||||||||Qk0OQgAAAAAAALYDAAAoAAAAlgAAAGkAAAABAAgAAAAAAAAAAA

DEDgAAxA4AAOAAAADgAAAAAAAA19fXAAA=.....

OBX|121|ED|15056^RBC Histogram.

BMP^99MRC|||||||F||||||||||||Qk0OQgAAAAAAALYDAAAoAAAAlgAAAGkAAAABAAgAAAAAAAAAAA

DEDgAAxA4AAOAAAADgAAAAAAAA/zMfXAAA=.....

OBX|122|ED|15600^WNB Scattergram.

BMP^99MRC|||||||F||||||||||||Qk3GXAAAAAAAALYDAAAoAAAAlgAAAJYAAAABAAgAAAAAAAAAAA

DEDgAAxA4AAOAAAADgAAAAAAfXAP8=.....

2. Bidirectional LIS request

A bidirectional LIS/HIS request message contains a sample bar code. After the LIS/HIS receives the request message, it will search for the corresponding patient and sample information to provide a response.

A request message contains three segments: MSH, ORC and QRF.

The system supports three sample downloading and query modes: Specified sample bar code, specified sample ID, and specified test time range.

The MSH segment is almost the same as the sample analysis result segment, except that the type field of MSH -9 is ORM^O01. The ORC -3 field is filled with the receiver ID. Here, the sample barcode is filled. Note that when the autoloading count initiates a query and the built-in barcode scanning error occurs, the value of the sample barcode field is Invalid.

Biochemistry, Immunology, and Coagulation Samples:

(1) Downloading Specified Sample Bar Code

A sample with bar code SampleID1 is downloaded.

MSH|^~\&| MiddleWare |Mindray|||20141114105932||ORM^O01|1|P|2.3.1|||||UNICODE

ORC|RF|| SampleID1||IP

QRF||||||RCT|COR|ALL||

(2) Downloading samples with specified ID range

The following samples are downloaded from the LIS:

MSH|^~\&| MiddleWare |Mindray|||20141114105932||ORM^O01|1|P|2.3.1|||||UNICODE

ORC|RF||||IP

QRF||||1|9|RCT|COR|ALL||

(3) Specified Time Range

The following samples are downloaded and analyzed from 10: 00 am to 3: 00 pm. The request message

is:

MSH|^~\&| MiddleWare|Mindray|||20141114105932||ORM^O01|1|P|2.3.1|||||UNICODE

ORC|RF||||IP

QRF||20120508100000|20120508150000|||RCT|COR|ALL||

Hematology Examples

MSH|^~\&|MiddleWare|Mindray|||20140328102554||ORM^O01|2|P|2.3.1|||||UNICODE
ORC|RF||sampleid99||IP
QRF||||||RCT|COR|ALL||

3. Two-way LIS query request response

When LIS receives a request message, it needs to send back a request response message. The first two message segments of the request response message are MSH and MSA. MSH -9 The Message Type field is filled with ORR^O02. For how to write the MSA segment, see the example of responding to the sample message. If the search succeeds, there will be PID, PV1, ORC, OBR and OBX message segments after the two heading segments to provide the patient and sample information in the same way as the sample data message does. The ORC segment is indispensable for an inquiry response message with searching results, in which the ORC-1 value is AF, and the ORC -2 field is filled with the searching primary key. Note that the value of the OBR -2 field must be consistent with that of the ORC -2 field; otherwise, the message is deemed incorrect.

An example of successful result searching is shown as follows:

Biochemistry, Immunology, and Coagulation Samples

MSH|^~\&|LIS||||20141114105932||ORR^O02|1|P|2.3.1|||||UNICODE

MSA|AA|1||||

PID|1||no1234^^^^MR||micro^owen||19860623122325|Male

PV1|1|patientype|dep^^b201|||||||||||||||gongfei

ORC|AF|1

OBR|1|1||00001^Worksheet response^99MRC||20141113170825||||sender||||20141114170825|||||1000||||HM

OBX|1|NM|30525-0^Age^LN||12|yr|||||F

OBX|2|NM|01008^Patient Area^99MRC||v44|||||F

OBX|3|NM|^APTT/Sec^ 99MRC^aptt-sec |||||||F

OBX|4|NM|^PT/INR^99MRC^pt-inr |||||||F

Hematology Examples:

MSH|^~\&|LIS|LISSimulator|||20250121175343||ORR^O02|8|P|2.3.1|||||UNICODE

MSA|AA|8|Message accepted|||0

PID|1|| 540224197311 ^^^^MR||^ Wang Hao || 19870422000000 |Male|||||||||||||||| mild depression.|||||

PV1|1|outpatient| Chest ^^HJM 808 |||||||||||||||| Self-paid

ORC|AF|hhh||BL

OBR|1|hhh||00011^Worksheet response^99MRC|N| 20250121171447 |||| Goldman ||| Fluid A 20250121174447 μL whole blood || Chest |||33||||HM||||| The patient first visited the hospital

OBX|1|NM|30525-0^Age^LN||37|yr|||||F

OBX|2|ST|01008^Patient Area^99MRC|||||||F

OBX|3|IS|01002^Ref Group^99MRC|| adult male ||||||F

OBX|4|IS|05007^Project Type^99MRC||BL||||||F

OBX|5|IS|08001^Take Mode^99MRC||A||||||F

OBX|6|IS|08002^Blood Mode^99MRC||W||||||F

OBX|7|IS|08003^Test Mode^99MRC||CBC+DIFF||||||F

An example of the inquiry response message with no search result is shown as follows. The MSA -2 field indicates the result of the response. If the MSA -2 value is "AR," the inquiry is rejected; if the MSA -2 value is "AE," the error occurs.

MSH|^~\&|LIS||||20141114095815||ORR^O02|1|P|2.3.1|||||UNICODE
MSA|AR|9

4. QC result message

Biochemistry, Immunology, and Coagulation Samples

When QC results are sent by sample, a complete Lis communication message is shown as follows:

MSH|^~\&| MiddleWare |Mindray|||20141114104119||ORU^R01|5|P|2.3.1|||||UNICODE
PID|1||no123^^^^MR||^name||20090105|Male
PV1|1||dept^^b102|||||||||||||||charge
OBR|1||1|00001^Automated
Count^99MRC|||20141113195229|||sender|||ganmao|20140811|||||1000||20141114104032||HM||||Admin||||Admin
OBX|1|NM|30525-0^Age^LN||5|yr|||||F
OBX|2|NM|^APTT/Sec^ 99MRC^aptt-sec||10.00|Sec|24.00-38.00||||F
OBX|3|NM|^PT/INR^99MRC^pt-inr ||0.50|INR|0.75-1.35||||F

When QC results are sent according to the control protocol, an example of complete Lis communication message is as follows:

MSH|^~\&| MiddleWare |Mindray |||20120508103014||ORU^R01|1|Q|2.3.1|||||ASCII

OBR|1|7|AST|00012^QC

Count^99MRC|0|20130729160839|20120405141255|20130729161552|||1|2|QUAL2|2222|20300101|0|M|55.000000|5.000000|0.137470| nkat/L || Instr^Instr |M1^M1|1102:2501^1103:2502^20157|||||1|||||||||||||||

Response from the LIS server:

MSH|^~\&|LIS||||20120508094823||ACK^R01|1|P|2.3.1||||2||ASCII

MSA|AA|1|Message accepted|||0|

The only difference between the QC response message and the analysis result response message is that the MSH -11 field value is Q.

Below is a QC message ACK.

MSH|^~\&|LIS| |||20140909162050||ACK^R01|9|Q|2.3.1|||||UNICODE

MSA|AA|1

5. Sample Load Message

After a sample is loaded to the LIS host, the host information is sent to the LIS host, and the LIS segment receives the sample for a second time based on the host information. LIS reply to ACK is not required.

For a sample with bar code 9527 -66 and ID Chem -9527, the instrument name is BS-2800 M, the module SN is Chem -31415926, and the test module name is M1, the information communication message is as follows:

MSH|^~\&|||||20141114105932||SCN^0001|1||2.3.1|||||UNICODE

CKI|1|9527-66|20101006084439|2800M| Chem-31415926| M1|5^2| Chem-9527

6. LIS sample receiving message

After the sample is delivered to the LIS host, the LIS generates a sample ID according to the host information, sends the sample information with the sample ID to the middleware, and updates the sample ID. LIS reply to ACK is not required.

A sample with bar code 9527 and sample ID Chem -123 is received by the LIS as follows:

MSH|^~\&|||||20141114105932||SSN^0002|1||2.3.1||||||UNICODE
CKI|1|9527|20141114105532|||||Chem-123

7. LIS sample position update message

When the sample returns to the output area, it sends the position information to the LIS end. LIS reply to ACK is not required.

When a sample with bar code 0003 and ID 1returns to the X1 partition of IO1, the message is as follows:

MSH|^~\&|MiddleWare|Mindray|||20240313142724||SPN^0003|2|P|2.3.1||||||UNICODE

SPI|1|0003|1|IO^1^N0007^1|X1|20240313142724|1^3^1|||||||

8. Test on LIS middleware canceled

Lis initiatively pushes the canceled protocol to the middleware. Only the ORC is filled in, and the information of the OBX item to be canceled is filled in.

MSH|^~\&|LIS||||20141114105932||ORR^O02|1|P|2.3.1||||||UNICODE

MSA|AA|1||||

PID|1||no1234^^^^MR||micro^owen||19860623122325|Male

PV1|1|patientype|dep^^b201|||||||||||||||gongfei

ORC|AF| SampleID1||||CA|

OBR|1|1||00001^Worksheet response^99MRC||20141113170825||||sender||||20141114170825||||||1000||||HM

OBX|1|NM|30525-0^Age^LN||12|yr|||||F

OBX|2|NM|01008^Patient Area^99MRC||v44|||||F

OBX|3|NM|^APTT/Sec^ 99MRC^aptt-sec |||||||F

OBX|4|NM|^PT/INR^99MRC^pt-inr |||||||F

9.LIS Distribute sorting completion test items to middleware

Lis Proactively push the sorting completion protocol to the middleware, as long as the ORC is filled in and the OBX project information to be cancelled is filled in

MSH|^~\&|LIS|LISSimulator|||20250108112218||ORR^O02|1|P|2.3.1|||P|||UNICODE

MSA|AA|1|

PID|1||130732195305^^^^MR||^X`||20040731000000|||||||||||||||xxxx|||||

PV1|1|Other|Department^^34G 681|||||||||||||||XXX

ORC|AF|chaoge05||||SORTEND

OBR|1|chaoge05||00011^Worksheet response^99MRC|N|20250108104915||||luolei||||20250108111915|Serum||Department|||3||||HM|||||XXXXXXXXX|

OBX|1|NM|30525-0^Age^LN||20|yr|||||F

OBX|2|ST|01008^Patient Area^99MRC|||||||F

OBX|3|IS|01002^Ref Group^99MRC||Common|||||F

OBX|4|NM|^Offline 1^99MRC^Out|||||||F

OBX|5|NM|^ Offline 5^99MRC^Down|||||||F

OBX|6|NM|^ Offline 2^99MRC^IN|||||||F

OBX|7|NM|^ Offline 3^99MRC^Up|||||||F

10.LIS Issuing the message that the middleware critical value has been processed

LIS actively pushes the protocol for handling critical values to the middleware, which requires filling in MSH, CPI, and OBX information for critical value items already processed by LIS.

MSH|^~\&|LIS||||20141114105932||CPN^0004|1|P|2.3.1|||||UNICODE

CPI|1|9527-66|Chem-123|ZHANG|20250120093215|LIU|189xxxx6220|Finished |

OBX|1|NM|^APTT/Sec^ 99MRC^aptt-sec|||||||F||||||1|

OBX|2|NM|^PT/INR^99MRC^pt-inr|||||||F||||||1|

Example of Hematology Transparent Data Message

Except for the sample inquiry, reply and uploading of sample results (including QC results in patient format), the middleware protocol is used for blood cell samples, and the "labXpert" protocol is used for other messages to be sent transparent to the Lis. For details about labXpert protocol, see H-046-011151-00 labXpert Communication Protocol (Chinese) .docx.

1. Example of QC message

The content of the QC message is different from the sample analysis result message: The MSH -11 value of the QC message is Q, which means the message type is QC data; A QC message is corresponding to a QC point in the labXpert software and may contain multiple analysis results. For example, an L-J QC message contains one analysis result, and an X-R QC message may contain two analysis results and average analysis results.

A QC message consists of an MSH message header and multiple analysis results. Each analysis result consists of PID and OBR message segment start, followed by multiple OBX segments to carry parameter results and other information. The OBR -4 field of each analysis result indicates the analysis result type. See for details. 0

Take an L-J QC message as an example:

MSH|^~\&|MiddleWare|Mindray|||20140909162050||ORU^R01|3|Q|2.3.1|||||UNICODE<CR>

PID|1||MB034H||||20141111000000<CR>

OBR|1||1|00003^LJ QCR^99MRC|||20140827193211|||||||||||||HM|||||||admin<CR>

OBX|1|IS|05001^Qc Level^99MRC||H|||||F<CR>

OBX|2|IS|08001^Take Mode^99MRC||A|||||F<CR>

OBX|3|IS|08002^Blood Mode^99MRC||W|||||F<CR>

OBX|4|IS|08003^Test Mode^99MRC||CBC+DIFF|||||F<CR>

OBX|5|ST|09001^Analyzer^99MRC||1#|||||F<CR>

OBX|6|NM|6690-2^WBC^LN||20.01|10*9/L|16.44-21.44|N|||F<CR>

OBX|7|NM|704-7^BAS#^LN||0.51|10*9/L|0.22-0.80|N|||F<CR>

OBX|8|NM|706-2^BAS%^LN||2.6|%|1.2-4.2|N|||F<CR>

OBX|9|NM|751-8^NEU#^LN||13.52|10*9/L|10.71-14.71|N|||F<CR>

OBX|10|NM|770-8^NEU%^LN||67.6|%|57.1-77.1|N|||F<CR>

OBX|11|NM|711-2^EOS#^LN||1.89|10*9/L|0.50-2.90|N|||F<CR>

OBX|12|NM|713-8^EOS%^LN||9.4|%|3.0-15.0|N|||F<CR>

OBX|13|NM|731-0^LYM#^LN||3.70|10*9/L|2.00-5.20|N|||F<CR>

OBX|14|NM|736-9^LYM%^LN||18.5|%|11.0-27.0|N|||F<CR>

OBX|15|NM|742-7^MON#^LN||0.39|10*9/L|0.00-1.22|N|||F<CR>

OBX|16|NM|5905-5^MON%^LN||1.9|%|0.0-5.7|N|||F<CR>

OBX|17|NM|789-8^RBC^LN||5.67|10*12/L|5.57-6.17|N|||F<CR>

OBX|18|NM|718-7^HGB^LN||17.5|g/dL|17.2-18.8|N|||F<CR>

OBX|19|NM|787-2^MCV^LN||107.6|fL|93.2-103.2|H~N|||F<CR>

OBX|20|NM|785-6^MCH^LN||30.8|pg|28.2-33.2|N|||F<CR>

OBX|21|NM|786-4^MCHC^LN||28.6|g/dL|28.2-34.2|N|||F<CR>

OBX|22|NM|788-0^RDW-CV^LN||15.9|%|8.7-20.7|N|||F<CR>

OBX|23|NM|21000-5^RDW-SD^LN||62.8|fL|39.2-63.2|N|||F<CR>

OBX|24|NM|4544-3^HCT^LN||0.611||0.546-0.606|H~N|||F<CR>

OBX|25|NM|777-3^PLT^LN||434|10*9/L|415-545|N|||F<CR>

OBX|26|NM|32623-1^MPV^LN||10.8|fL|8.3-14.3|N|||F<CR>

OBX|27|NM|32207-3^PDW^LN||16.5||11.5-21.5|N|||F<CR>

OBX|28|NM|10002^PCT^99MRC||0.471|%|0.342-0.742|N|||F<CR>

OBX|29|NM|10014^PLCR^99MRC||32.9|%|26.3-46.3|N|||F<CR>

OBX|30|NM|10013^PLCC^99MRC||143|10*9/L|124-224|N|||F<CR>

OBX|31|NM|51584-1^IMG#^LN||0.56|10*9/L||N|||F<CR>

OBX|32|NM|38518-7^IMG%^LN||2.8|%||N|||F<CR>

OBX|33|NM|10020^HFC#^99MRC||0.00|10*9/L||N|||F<CR>

OBX|34|NM|10021^HFC%^99MRC||0.0|%||N|||F<CR>

OBX|35|NM|10022^PLT-I^99MRC||434|10*9/L||N|||F<CR>

OBX|36|NM|10024^WBC-D^99MRC||20.02|10*9/L||N|||F<CR>

OBX|37|NM|10025^WBC-B^99MRC||20.01|10*9/L||N|||F<CR>

OBX|38|NM|10031^PDW-SD^99MRC||14.3|fL||N|||F<CR>

OBX|39|NM|10032^InR#^99MRC||0.00|10*9/L||N|||F<CR>

OBX|40|NM|10033^InR‰^99MRC||0.00|‰||N|||F<CR>

OBX|41|NM|12227-5^WBC^LN||20.01|10*9/L|16.44-21.44|N|||F<CR>

<EB><CR>

Remarks: For "Analyzer" (OBX), the processing line 6800 will transmit this field, while the standalone 6800 will not.

2. LabXpert sends the message to LIS

2.1 Description:

If the LIS host needs to be connected to the analyzer, it will produce the serial number when receiving the sample. You can enable the sample on-board notification on the LabXpert communication setup screen.

After the notification switch is enabled, the labXpert system first saves the sample on the analyzer, notifies the event message to the LIS when the barcode is scanned, and notifies the sample on the analyzer.

After receiving the notification message, the LIS system checks the sample barcode, and generates a serial number if the sample has not been serial number. Then the sample information is pushed to the labXpert, and the serial number of the labXpert is updated.

2.2 Message Example:

Push sample message ORM^N01, which is the same as the two-way LIS inquiry message except that the message type is ORM^N01.

The following example shows the sample load message ORM^N01 message (after//characters, it is the segment comment, not the message content):

MSH|^~\&|MiddleWare|Mindray||| 20230417102330 ||ORM^N01|3|P|2.3.1|||||UNICODE<CR>//MSH -9 indicates the message type ORM^N01.

ORC|||SampleID 4001 |BL||1^2//ORC -2 is not used. Fill in the blank field. ORC -3 fill in sample ID; The BL representative of ORC -4 is a blood sample. ORC -6 fill in the tube position, in the form of tube rack number ^ tube number, but if it is open-vial or the notification initiated by the sample management system, fill in the tube rack number and tube number as blank

OBX|1|ST|09001^Analyzer^99MRC||BC -68 -1 ||||||F//Instrument name, which can be set on the labXpert system. For the example, enter BC10 -1.

OBX|2|ST|09003^SN^99MRC||SW-02342||||||F//Serial number of the analyzer. It is only used to identify the analyzer. If the user initiates a query manually through the labXpert, it may be blank.

3. LabXpert sends real-time tube position to LIS

3.1 Description:

If the LIS requires the tube to be in the real-time tube position of the sample management system, the switch for sending the real-time tube position to the LIS can be enabled in the labXpert communication setup.

After the real-time tube position to LIS switch is enabled, the real-time tube position to LIS is sent when:

(1) The tubes are output from the processing system to the sample management system.

(2) Take out the tray with tubes from the sample management system.

(3) Take out the tubes from the sample management system using the take out function.

3.2 Message

The message of sending real-time tube position to LIS is ORM^N03

In the following example, the real-time tube position is sent to the LIS message ORM^N03 message (the part after//characters, is the message segment comment, not the message content):

(1) Delivery type Output: The tubes are output from the processing system to the sample management system

MSH|^~\&|MiddleWare|Mindray||| 20230726194415 ||ORM^N03|7|P|2.3.1|||||UNICODE//MSH -9 indicates the message type ORM^N03.

ORC|||ctr3|BL//ORC -3 Input sample ID; ORC -4 fill in BL; the representative is a blood sample.

OBX|1|ST| 16767 ^Dispatch Type^99MRC||Output|||||F//delivery type: Output

OBX|2|ST| 16763 ^Drawer No^99MRC||1|||||F//Drawer No.

OBX|3|ST| 16764 ^Tray No^99MRC||N0015|||||F//Tray No.

OBX|4|ST| 16765 ^TrayTube No^99MRC||24|||||F//tube number in the tray

OBX|5|ST| 16766 ^RealTime TubePos^99MRC||1-N0015 -24 ||||||F//real-time tube position, composed of the drawer number, tray number, and tube number in the tray, in the format of drawer number – tray number – tube number in the tray

(2) Delivery type PickOutTray: Take out tube trays from the sample management system

MSH|^~\&|MiddleWare|Mindray||| 20230726194415 ||ORM^N03|7|P|2.3.1|||||UNICODE//MSH -9 indicates the message type ORM^N03.

ORC|||ctr3|BL//ORC -3 Input sample ID; ORC -4 fill in BL; the representative is a blood sample.

OBX|1|ST| 16767 ^Dispatch Type^99MRC||PickOutTray|||||F//, delivery type: PickOutTray

OBX|2|ST| 16764 ^Tray No^99MRC||N0015|||||F//Tray No.

OBX|3|ST| 16765 ^TrayTube No^99MRC||24|||||F//Tube number in the tray

OBX|4|ST| 16766 ^RealTime TubePos^99MRC||N0015 -24 |||||F//real-time tube position, composed of the tray number and the tube number in the tray, in the format of tray number-tube number in the tray

(3) Delivery type PickOutTube: Take-out tube from sample management system

MSH|^~\&|MiddleWare|Mindray||| 20230726194415 ||ORM^N03|7|P|2.3.1|||||UNICODE MSH -9 indicates the message type ORM^N03.

ORC|||ctr3|BL//ORC -3 Input sample ID; ORC -4 fill in BL; the representative is a blood sample.

OBX|1|ST| 16767 ^Dispatch Type^99MRC||PickOutTube|||||F//, delivery type: PickOutTube

OBX|2|ST| 16766 ^RealTime TubePos^99MRC|| |||||F//real-time tube position has been taken out, character string: Taken out (multi-language supported)

4. LIS notification message interaction of labXpert

4.1 Description

If the LIS focuses on the sample scheduling analysis and review process, the labXpert must inform the sample of the analysis and review events on the sample processing line in time.

The status notification timing is as follows:

(1) The slide maker&stainer starts the analysis, notifying the analysis status as slide making and reading.

(2) Receive results of routine blood test, SAA, CRP, ESR

a) Click Rerun, Smear Making and Review, add the remaining test items, and notify the analysis status of to-be-rerun, to-be-made and to-be-read.

b) After the rerun is completed, the system prompts that the analysis status is Rerun.

c) The sample flag is auto validate, and the status of the notification report is auto validate.

(3) The slide maker&stainer completes the analysis, and informs the analysis status as Slide Making and Slide Reading.

(4) Manually validate the sample, cancel validate the sample report, and notify whether the report review status is Validated or Not Validated.

(5) Modify sample ID

a) When the Rerun, Smear and Review rules are clicked, the remaining chemistries are added, and the analysis status of the chemistries is Rerun, Smear and Review.

b) The sample flag is auto validated and the status of the notification report is auto validated.

（6） Modify the sample test item and notify the analysis status change.

4.2 Example of Interactive Message

MSH|^~\&|MiddleWare|Mindray||| 20240109101112 ||ORM^N07|3|P|2.3.1|||||UNICODE//MSH -9 indicates the message type ORM^N07.

ORC|||SampleID 4001 |BL//ORC -3 Fill in the sample barcode and ORC -4 fill in BL, which represents a blood sample.

OBX|1|IS| 16768 ^OperateType^99MRC||SyncSampleStatus|||||F//: Operation type. The fixed value is SyncSampleStatus when the sample status changes synchronously.

OBX|2|IS| 16772 ^OperateSource^99MRC||StartCounting|||||F//The type of operation that causes the synchronization status to be triggered, indicating the current action that causes the sample status to change.

OBX|3|IS| 16773 ^RemainAnalyzeModes^99MRC|CBC+DIFF+A1C+SMST+100WBC|||||F//Remaining mode of the sample that has not been analyzed yet

OBX|4|ST| 16774 ^TestStatus^99MRC|BloodWaitRerun+SaaRerunned+CrpWaitAnalyzing+Smearing+Scanned||||||F//Test the analysis status, and connect it to multiple analysis statuses by adding them.

OBX|5|ST| 16775 ^ReportAuditStatus^99MRC|BloodAutoAudit+A1cWaitAudit+ScanAudited||||||F//Report review status, between multiple report review statuses, plus

Possible SourceOperateType operation types:

Name	Description
StartCounting	Start sample analysis. Currently, only the SM&S and slide reader report the analysis status change event when they start the analysis.
FinishCount	The sample is analyzed and the result is reported. If the result is received, the sample analysis status will change. Running reexam rules and adding chemistries may change the analysis status. If it is a blood routine test result, the sample may be marked as auto validated, which may change the status of the sample.
Audit	The user reviews the sample. The review status of the sample may change.
CancelAudit	User cancels the sample review. The review status of the sample may change.
ModifySampleID	Modify sample ID. If sample ID is modified to query LIS again, and test items are added, the sample analysis status may change. If sample ID is modified to mark Auto Review, the sample review status may change.
ReviseTestItems	Manually adjust the test items.

Test analysis status, including the current analysis status of multiple test types. The analysis statuses are connected by "+." Possible analysis statuses include:

Status	Description
BloodWaitAnalyzing	Blood routine, Crp, Saa, Esr, glycation chemistries to be analyzed.
CrpWaitAnalyzing	
SaaWaitAnalyzing	
EsrWaitAnalyzing	
A1cWaitAnalyzing	
BloodWaitRerun	Blood routine, Crp, Saa, Esr, glycation chemistries to be rerun. When tests of routine blood test, Crp test, Saa
CrpWaitRerun	
SaaWaitRerun	

EsrWaitRerun	test, Esr test, and HbA1c test are finished, the system will automatically rerun or rerun the sample, or manually add chemistries to the analysis mode, which will be marked as pending rerun.
A1cWaitRerun	
BloodRerunned	Blood routine, Crp, Saa, Esr and glycation chemistries have been rerun.
CrpReruned	
SaaRerunned	
EsrRerunned	
A1cRerunned	
NeedSmear	To be smeared. When the sample is loaded to the instrument, it is found that the slide making mode is required. Or the sample needs auto slide making and re-exam, and the status is pending slide making.
Smearing	The slide is being made. The slide making analysis is started for the sample, and the status is pending.
Smeared	The sample has been smeared.
SmearError	Slide making error.
NeedScan	To be reviewed. When the sample is loaded to the analyzer, it is found that the sample needs to be reviewed. Or the sample needs to be reviewed and read automatically.
Scanning	Reading. The sample analysis process is started, and the status is to be read.
Scanned	Reviewed. The sample is read and analyzed, and the status is read.
ScanError	Reading error.

Report review status, including multiple types of report review statuses, connected by +. Possible report review statuses include:

Status	Description
BloodAutoAudited	Routine Blood Sample Test Report, marked as Auto Review.

BloodWaitAudit	Hematology report/HbA1c report/Review report, the completed analysis has not been reviewed, or the review is canceled and marked as pending manual review.
A1cWaitAudit	
ScanWaitAudit	
BloodAudited	Hematology report/HbA1c report/Review report Manual review is performed and marked as Manual Review Status.
A1cAudited	
ScanAudited	

If there are other modes except slide making in the sample report, and there are no analysis results, the report is considered not completed, and the report review status is not communicated.

5. Communication of QC results of NovoZan

The communication of the QC results of Novartis is basically the same as that of the QC results of Mindray, except that the QC file No. is blank.

An example of LJ QC result communication message:

MSH|^~\&|MiddleWare|Mindray|||20240815173305||ORU^R01|3|Q|2.3.1|||||UNICODE

PID|1||QCLotNo1||||20240815000000

OBR|1|||00003^LJ QCR^99MRC|||20240815173304|||||||||||||||HM

OBX|1|IS|05001^Qc Level^99MRC||H|||||F

OBX|2|IS|08003^Test Mode^99MRC||PCT|||||F

OBX|3|ST|09001^Analyzer^99MRC||vaz#1|||||F

OBX|4|NM|17139^Poct Pct^99MRC||7.000|ng/mL|7.000-13.000|N|||F

Connection control

1. Middleware as TCP Server

The TCP server starts monitoring after the middleware is started up or the communication setup is modified. It can accept an LIS connection which lasts until message transmission fails, the communication setup is modified or the middleware is closed.

2. Middleware as TCP Client

After the middleware software is started up or the communication settings are modified, the middleware software will automatically try to connect.

After the connection is established successfully, it will be maintained until the connection is disconnected, the communication settings are modified, or the middleware is closed.

3. Two-way LIS

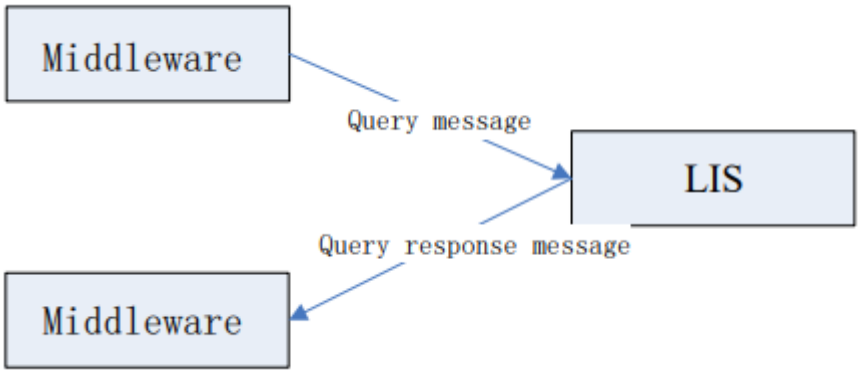

Figure Two-Way LIS Sending Process From Middleware To LIS3

First, the middleware sends a request message to the LIS, and the message sending process is consistent with the data transfer process. Wait for the LIS response message and the set timeout time after successful sending. The message processing flow of LIS responding to the inquiry should also be consistent with that of data transfer.

Annex A HL7 Protocol Overview

A.1 HL7 Basic Syntax

A.1.1 Message Construction Rules

Every HL7 message consists of segments (Segment) which end with <CR> (0x0D).

Each segment consists of a segment name of three characters and a variable number of fields. Each field consists of component Component and subcomponent SubComponent. The delimiters of the fields, components and subcomponents are defined in the MSH segment of each message.

For example:

MSH|^~\&|Mindray|LabXpert|||20060427194802||ORU^R01|1|P|2.3.1|||||UNICODE

Where:

The five characters after MSH define the delimiters used to distinguish the fields, components, and subcomponents. Although these characters can be any non-text characters, HL7 standard recommends the following characters:

Table 13 HL Delimiter

Characters	Meaning
|	Field delimiter
^	Component delimiter
&	Subassembly delimiter
~	Repetition delimiter
\	Escape character

The first two fields of MSH include delimiters. Some fields are blank because they are optional and not used by Mindray HL7 interface. See Definition of Message Segment for field definition and selection.

For messages of any type, the segments following MSH appear in a fixed order. The order is described in the following sections and the grammar is used to indicate the order of the segments.

Optional segments appear in the [].

The segments in {} can be repeated once or more.

A.1.2 String escape rule

In the field data of ST, TX, FT, CF, etc., delimiters may appear in strings such as remarks, diagnosis information, and user-defined gender. When coding, the delimiters in the original string should be converted to escape character sequences, and then restored during decoding. The escape rules of HL7 are as follows:

Escape character sequence	Original character
\F\	Field delimiter
\S\	Component delimiter
\T\	Subassembly delimiter
\R\	Repetition delimiter
\E\	Escape delimiter

\.br\	<CR>, i.e. message segment stop character.

Note: The "\" in the escape string sequence represents the escape delimiter, whose value is defined in the MSH segment.

Annex B HL7 Data Type Definition

CE - Code Element

<identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of alternate coding system (ST)>

CM - Composite

The format is defined by specific fields.

CX - Extended composite ID with check digit

<ID (ST)> ^ <check digit (ST)> ^ <code identifying the check digit scheme employed (ID)> ^ < assigning authority (HD)> ^ <identifier type code (IS)> ^ < assigning facility (HD)>

ED – Encapsulate Data

<source application (HD) > ^ <type of data (ID) > ^ <data sub type (ID) > ^ <encoding (ID) > ^ <data (ST)

EI - Entity Identifier

<entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>

FC – Financial Class

<financial class (IS) > ^ <effective date (TS)

HD - Hierarchic designator

<namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>

Used only as part of EI and other data types.

FT - Formatted text

This data type is derived from the string data type by allowing the addition of embedded formatting instructions. These instructions are limited to those that are intrinsic and independent of the circumstances under which the field is being used.

IS - Coded value for user-defined tables

The value of such a field follows the formatting rules for an ST field except that it is drawn from a site-defined (or user-defined) table of legal values. There shall be an HL7 table number associated with IS data types.

ID - Coded values for HL7 tables

The value of such a field follows the formatting rules for an ST field except that it is drawn from a table of legal values. There shall be an HL7 table number associated with ID data types.

NM - Numeric

A number represented as a series of ASCII numeric characters consisting of an optional leading sign (+ or -), the digits and an optional decimal point.

PL - Person location

<point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ < location status (IS)> ^ <person location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ <location description (ST)>

PT - Processing type

<processing ID (ID)> ^ <processing mode (ID)>

SI - Sequence ID

A non-negative integer in the form of an NM field. The uses of this data type are defined in the chapters defining the segments and messages in which it appears.

ST – String

TS - Time stamp

YYYY[MM[DD[HHMM[SS[.S[S[S[S]]]]]]]][+/-ZZZZ] ^ <degree of precision>

XCN - Extended composite ID number and name

In Version 2.3, use instead of the CN data type. <ID number (ST)> ^ <family name (ST)> & <last_name_prefix (ST) ^ <given name (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <source table (IS)> ^ <assigning authority (HD)> ^ <name type code (ID)> ^ <identifier check digit (ST)> ^ <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)> ^ <name representation code (ID)>

XPN - Extended person name

In Version 2.3, replaces the PN data type. <family name (ST)> ^ <given name (ST)> & <last_name_prefix (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (IS)> ^ <name type code (ID) > ^ <name representation code (ID)>

VID - Version identifier

<version ID (ID)> ^ <internationalization code (CE)> ^ <international version ID (CE)>

Annex B Message Coding Definition

1. In HL7 communication message, the OBR -4 (Universal Serview ID) field, in the form of "ID^Name^EncodeSys," is used to identify the type of the analysis result, such as sample analysis result, microscopic examination result or QC result. The following table lists all code values of this field.

OBR -4 Message type code table

Data Item	Code (ID)	Name	Coding system (EncodeSys)	Remarks
Analysis Result	00001	Automated Count	99MRC	
Microscopic examination results	00002	Manual Count	99MRC	
LJ QC count result	00003	LJ QCR	99MRC	
X QC count results	00004	X QCR	99MRC	
XB QC count result	00005	XB QCR	99MRC	
XR QC count result	00006	XR QCR	99MRC	
X mean QC results	00007	X QCR Mean	99MRC	
Mean value of XR analysis results	00008	XR QCR Mean	99MRC	
XM QC count results	00009	XM QCR	99MRC	
Worklist Query	00010	Worksheet Request	99MRC	
Worklist Response	00011	Worksheet Response	99MRC	
Biochemistry, Immunoassay and Coagulation QC Results	00012	QC Count	99MRC	

2. Each OBX segment contains the information of one analysis parameter or other data items. It consists of the following fields: OBX -2 indicates the type of HL7 data; OBX -3 (Observation Identifier) is the identifier of a data item in the form of "ID^Name^EncodeSys"; The OBX -5 contains the value of a data item. OBX -6 includes the parameter unit, expressed in the standard unit recommended by HL7. Note: Picture data is always transmitted in the OBX -24 field.

错误!未找到引用源。 Lists the HL7 type and code identifier of all communication data items. Lists all communication parameter units used.

Uneven RBC size grading result	NM	16727-1	Anis	99MRC	16727-1 ^Anis^99MRC
Macrocytic grading result	NM	16728-1	Macr	99MRC	16728-1 ^Macr^99MRC

Microcytosis grading result	NM	16729-1	Micr	99MRC	16729-1 ^Micr^99MRC
Hypochromic Red Blood Cell Grading Result	NM	16730-1	HypoCh	99MRC	16730-1 ^HypoCh^99MRC
Polychromatic red cell grading result	NM	16731-1	PolyCH	99MRC	16731-1 ^PolyCH^99MRC
RBC malformation grading result	NM	16732-1	Poik	99MRC	16732-1 ^Poik^99MRC
Segmented Red Blood Cell Grading Result	NM	16733-1	Schi	99MRC	16733-1 ^Schi^99MRC
Sawtooth RBC grading result	NM	16734-1	Echi	99MRC	16734-1 ^Echi^99MRC
Oval RBC grading result	NM	16735-1	Elli	99MRC	16735-1 ^Elli^99MRC
Oval RBC grading result	NM	16736-1	Oval	99MRC	16736-1 ^Oval^99MRC
Oral RBC Grading Result	NM	16737-1	Stom	99MRC	16737-1 ^Stom^99MRC
Target RBC grading result	NM	16738-1	Targ	99MRC	16738-1 ^Targ^99MRC
Teardrop-shaped Red Blood Cell Grading Result	NM	16739-1	Tear	99MRC	16739-1 ^Tear^99MRC
Basophilic stippling grading result	NM	16740-1	Baso	99MRC	16740-1 ^Baso^99MRC
Acanthocyte grading result	NM	16741-1	Acan	99MRC	16741-1 ^Acan^99MRC
Bite mark RBC grading result	NM	16742-1	Bite	99MRC	16742-1 ^Bite^99MRC
Vesicular Red Blood Cell Grading Result	NM	16743-1	Blis	99MRC	16743-1 ^Blis^99MRC
Irregular Systolic Red Blood Cell Grading Result	NM	16744-1	Irre	99MRC	16744-1 ^Irre^99MRC
Sickle Cell Grading Result	NM	16745-1	Sick	99MRC	16745-1 ^Sick^99MRC
Spherical Red	NM	16746-1	Sphe	99MRC	16746-1 ^Sphe^99MRC

Blood Cell Grading Result					
RBC agglutination grading result	NM	16747-1	Aggl	99MRC	16747-1 ^Aggl^99MRC
RBC roulette sorting and grading result	NM	16748-1	Roul	99MRC	16748-1 ^Roul^99MRC
Haojiao Body Grading Result	NM	16749-1	Howe	99MRC	16749-1 ^Howe^99MRC
Pappenheim body classification result	NM	16750-1	Papp	99MRC	16750-1 ^Papp^99MRC
Parasite classification result	NM	16751-1	Para	99MRC	16751-1 ^Para^99MRC
Neutrophil granulocyte percentage	NM	16761-1	BfNeu%	99MRC	16761-1 ^BfNeu%^99MRC
Quantity of neutrophil granulocyte	NM	16761-2	BfNeu#	99MRC	16761-2 ^BfNeu#^99MRC
Percentage of macrophages (including monocytes)	NM	16762-1	BfMac%	99MRC	16762-1 ^BfMac%^99MRC
Number of macrophages (including monocytes)	NM	16762-2	BfMac#	99MRC	16762-2 ^BfMac#^99MRC
Degree	NM	17129	Dohle	99MRC	17129^Dohle^99MRC
Degree	NM	17130	Vacuo	99MRC	17130^Vacuo^99MRC
Degree	NM	17131	HyperGran	99MRC	17131^HyperGran^99MRC
Degree	NM	17132	HypoGran	99MRC	17132^HypoGran^99MRC
Degree	NM	17133	HyperSeg	99MRC	17133^HyperSeg^99MRC
Degree	NM	17134	HypoSeg	99MRC	17134^HypoSeg^99MRC
Platelet level	NM	17135	PLVL	99MRC	17135^PLVL^99MRC
Platelet aggregation	NM	17136	PCLMP	99MRC	17136^PCLMP^99MRC

Table 15 Communication Parameter Units

错误!未找到引用源。 Data Type and Coding System

Data Item	HL7 OBX -2	Code (ID)	Name	Coding system (EncodeSys)	Example OBX -3 field
Other data items					
Loading mode	IS	08001	Take Mode	99MRC	08001^Take Mode^99MRC
Blood mode	IS	08002	Blood Mode	99MRC	08002^Blood Mode^99MRC
measurement mode	IS	08003	Test Mode	99MRC	08003^Test Mode^99MRC
Age	NM	30525-0	Age	LN	30525-0 ^Age^LN
Remarks	ST	01001	Remark	99MRC	01001^Remark^99MRC
Reference group	IS	01002	Ref Group	99MRC	01002^Ref Group^99MRC
Re-exam flag	IS	01006	Recheck flag	99MRC	01006^Recheck flag^99MRC
Sample Type	IS	01007	Sample Type	99MRC	01007^Sample Type^99MRC
Ward	IS	01008	Patient Area	99MRC	01008^Patient Area^99MRC
Custom patient demographics 1	ST	01009	Custom patient info 1	99MRC	01009^Custom patient info 1^99MRC
Custom patient demographics 2	ST	01010	Custom patient info 2	99MRC	01010^Custom patient info 2^99MRC
Custom patient demographics 3	ST	01011	Custom patient info 3	99MRC	01011^Custom patient info 3^99MRC
Rack No.	ST	01012	Shelf No	99MRC	01012^Shelf No^99MRC
Tube No.	ST	01013	Tube No	99MRC	01013^Tube No^99MRC
Report time	ST	01014	Report Time	99MRC	01014^Report Time^99MRC
Charge type	ST	01015	Charger type	99MRC	01015^Charger type^99MRC
Patient Category	ST	01016	Patient type	99MRC	01016^Patient type^99MRC

QC Level	IS	05001	Qc Level	99MRC	05001^Qc Level^99MRC
QC date edited flag	IS	05002	QC test date modify flag	99MRC	05002^QC test date modify flag^99MRC
QC time edited flag	IS	05003	QC test time modify flag	99MRC	05003^QC test time modify flag^99MRC
Expiration date of QC	ST	05004	Qc valid date	99MRC	05004^Qc valid date ^99MRC
QC File No.	ST	05005	Qc file No	99MRC	05005^Qc file No ^99MRC
Lot No.	ST	05006	Qc lot No	99MRC	05006^Qc lot No ^99MRC
Test Item	IS	05007	Project type	99MRC	05007^Project Type^99MRC
Instrument Name	ST	09001	Analyzer	99MRC	09001^Analyzer^99MRC
CRP Analyzer Channel	ST	09002	CRP Channel	99MRC	1
Sample serial number	ST	08005	SerialNumber	99MRC	08005^SerialNumber^99MRC
Conclusion	ST	09999	AuditResult	99MRC	09999^ AuditResult ^99MRC
Review Rules Details	ST	09997	AuditMessages	99MRC	09997^ AuditMessages ^99MRC
LisTestID	ST	09998	LisTestID	99MRC	09998^ LisTestID ^99MRC
Analyzer SN	ST	09003	SN	99MRC	09003^ SN ^99MRC
Expert Tips	ST	09996	SpecialistMessages	99MRC	09996^SpecialistMessages ^99MRC
SAA instrument channel	ST	10101	SAA Channel	99MRC	10101^SAA Channel^99MRC
Operation Type	IS	16768	OperateType	99MRC	16768^OperateType ^99MRC
Internal id of LIS-initiated operation request, optionally used	ST	16769	OperateInnerId	99MRC	16769^OperateInnerId ^99MRC
LIS-initiated	IS	16770	OperateResult	99MRC	16770^OperateResult

operation response or execution result					^99MRC
LIS-initiated operation response or detailed execution prompt information, optionally used	ST	16771	OperatePromptMessage	99MRC	16771^OperatePromptMessage ^99MRC
Source operation type, indicating the reason for notification of operation change	IS	16772	OperateSource	99MRC	16772^OperateSource ^99MRC
Remaining analysis mode	IS	16773	RemainAnalyzeModes	99MRC	16773^ RemainAnalyzeModes ^99MRC
Sample analysis status	ST	16774	TestStatus	99MRC	16774^TestStatus ^99MRC
Sample report review status	ST	16775	ReportAuditStatus	99MRC	16775^ReportAuditStatus ^99MRC
Test Result Data Items					
WBC	NM	6690-2	WBC	LN	6690-2 ^WBC^LN
WBC_CORRECT	NM	12227-5	CORRECTED WBC	LN	12227-5 ^CORRECTED WBC ^LN
BAS	NM	704-7	BAS#	LN	704-7 ^BAS#^LN
BAS_PER	NM	706-2	BAS%	LN	706-2 ^BAS%^LN
NEU	NM	751-8	NEU#	LN	751-8 ^NEU#^LN
NEU_PER	NM	770-8	NEU%	LN	770-8 ^NEU%^LN
EOS	NM	711-2	EOS#	LN	711-2 ^EOS#^LN
EOS_PER	NM	713-8	EOS%	LN	713-8 ^EOS%^LN
LYM	NM	731-0	LYM#	LN	731-0 ^LYM#^LN

LYM_PER	NM	736-9	LYM%	LN	736-9 ^LYM%^LN
MON	NM	742-7	MON#	LN	742-7 ^MON#^LN
MON_PER	NM	5905-5	MON%	LN	5905-5 ^MON%^LN
RBC	NM	789-8	RBC	LN	789-8 ^RBC^LN
HGB	NM	718-7	HGB	LN	718-7 ^HGB^LN
MCV	NM	787-2	MCV	LN	787-2 ^MCV^LN
MCH	NM	785-6	MCH	LN	785-6 ^MCH^LN
MCHC	NM	786-4	MCHC	LN	786-4 ^MCHC^LN
RDW_CV	NM	788-0	RDW-CV	LN	788-0 ^RDW-CV^LN
RDW_SD	NM	21000-5	RDW-SD	LN	21000-5 ^RDW-SD^LN
HCT	NM	4544-3	HCT	LN	4544-3 ^HCT^LN
PLT	NM	777-3	PLT	LN	777-3 ^PLT^LN
MPV	NM	32623-1	MPV	LN	32623-1 ^MPV^LN
PDW	NM	32207-3	PDW	LN	32207-3 ^PDW^LN
PCT (platelets)	NM	10002	PCT	99MRC	10002^PCT^99MRC
RET	NM	14196-0	RET#	LN	14196-0 ^RET#^LN
RET_PER	NM	4679-7	RET%	LN	4679-7 ^RET%^LN
IRF	NM	33516-6	IRF	LN	33516-6 ^IRF^LN
LFR	NM	10015	LFR	99MRC	10015^LFR^99MRC
MFR	NM	10016	MFR	99MRC	10016^MFR^99MRC
HFR	NM	10017	HFR	99MRC	10017^HFR^99MRC
NRBC	NM	30392-5	NRBC#	LN	30392-5 ^NRBC#^LN
NRBC_PER	NM	26461-4	NRBC%	LN	26461-4 ^NRBC%^LN
P_LCR	NM	10014	PLCR	99MRC	10014^PLCR^99MRC
P_LCC	NM	10013	PLCC	99MRC	10013^PLCC^99MRC
RBC-O	NM	10018	RBC-O	99MRC	10018^RBC-O^99MRC
PLT-O	NM	10019	PLT-O	99MRC	10019^PLT-O^99MRC
HFC	NM	10020	HFC#	99MRC	10020^HFC#^99MRC
HFC_PER	NM	10021	HFC%	99MRC	10021^HFC%^99MRC
PLT-I	NM	10022	PLT-I	99MRC	10022^PLT-I^99MRC
WBC-R	NM	10023	WBC-R	99MRC	10023^WBC-R^99MRC
WBC-D	NM	10024	WBC-D	99MRC	10024^WBC-D^99MRC
WBC-B	NM	10025	WBC-B	99MRC	10025^WBC-B^99MRC
WBC-N	NM	10026	WBC-N	99MRC	10026^WBC-N^99MRC
PDW_SD	NM	10031	PDW_SD	99MRC	10031^PDW-SD^99MRC
InR	NM	10032	InR#	99MRC	10032^InR#^99MRC

InR_PER	NM	10033	InR‰	99MRC	10033^InR‰^99MRC
WBC_BF	NM	57845-0	WBC-BF	LN	57845-0 ^WBC-BF^LN
RBC_BF	NM	23860-0	RBC-BF	LN	23860-0 ^RBC-BF^LN
MN_BF	NM	26490-3	MN#	LN	26490-3 ^MN#^LN
MN_BF_PER	NM	26493-7	MN%	LN	26493-7 ^MN%^LN
EOS_BF	NM	35063-7	Eos-BF#	LN	35063-7 ^Eos-BF#^LN
EOS_BF_PER	NM	26452-3	Eos-BF%	LN	26452-3 ^Eos-BF%^LN
PMN_BF	NM	10034	PMN#	99MRC	10034^PMN#^99MRC
PMN_BF_PER	NM	10035	PMN%	99MRC	10035^PMN%^99MRC
TNC_BF_BF	NM	10036	TC-BF#	99MRC	10036^TC-BF#^99MRC
HF-BF#	NM	10037	HF-BF#	99MRC	10037^ HF-BF#^99MRC
HF-BF%	NM	10038	HF-BF%	99MRC	10038^ HF-BF%^99MRC
RBC-BF-R	NM	10039	RBC-BF-R	99MRC	10039^ RBC-BF-R ^99MRC
IMG#	NM	51584-1	IMG#	LN	51584-1 ^ IMG# ^LN
IMG%	NM	38518-7	IMG%	LN	38518-7 ^ IMG% ^LN
IPF	NM	10041	IPF	99MRC	10041 ^ IPF ^99MRC
Micro#	NM	15199-3	Micro#	LN	15199-3 ^ Micro# ^ LN
Micro%	NM	10042	Micro%	99MRC	10042 ^ Micro% ^99MRC
Macro#	NM	15198-5	Macro#	LN	15198-5 ^ Macro# ^ LN
Macro%	NM	10040	Macro%	99MRC	10040 ^ Macro% ^99MRC
MRV	NM	48706-6	MRV	LN	48706-6 ^ MRV ^ LN
RHE	NM	10043	RHE	99MRC	10043 ^ RHE ^99MRC
Neu-BF#	NM	10044	Neu-BF#	99MRC	10044 ^ Neu-BF# ^99MRC
Neu-BF%	NM	10045	Neu-BF%	99MRC	10045 ^ Neu-BF% ^99MRC
Neuts Band%. Manual	NM	764-1	Neuts Band%. Manual	LN	764-1 ^ Neuts Band%. Manual ^LN
Neuts Seg%. Manual	NM	769-0	Neuts Seg%. Manual	LN	769-0 ^ Neuts Seg%. Manual ^ LN
Abnormal Lymphs%. Manual	NM	29261-5	Abnormal Lymphs%. Manual	LN	29261-5 ^ Abnormal Lymphs%. Manual ^LN
Pla-Aly%	NM	33835-0	Pla-Aly%	99MRC	33835-0 ^ Pla-Aly% ^99MRC

Mon-Aly%	NM	4662-3	Mon-Aly%	99MRC	4662-3 ^ Mon-Aly% ^99MRC
Imm-Aly%	NM	10046	Imm-Aly%	99MRC	10046 ^ Imm-Aly% ^99MRC
Other-Aly%	NM	10047	Other-Aly%	99MRC	10047 ^ Other-Aly% ^99MRC
Metamyelocyte%. Manual	NM	740-1	Metamyelocyte%. Manual	LN	740-1 ^ Metamyelocyte%. Manual ^LN
Myelocytes%. Manual	NM	749-2	Myelocytes%. Manual	LN	749-2 ^ Myelocytes%. Manual ^LN
Promyelocytes%. Manual	NM	783-1	Promyelocytes%. Manual	LN	783-1 ^ Promyelocytes%. Manual ^ LN
Imm-Eos%	NM	33803-8	Imm-Eos%	99MRC	33803-8 ^ Imm-Eos% ^99MRC
Imm-Bas%	NM	33786-8	Imm-Bas%	99MRC	33786-8 ^ Imm-Bas% ^99MRC
Blast%	NM	10049	Blast%	99MRC	10049 ^ Blast% ^99MRC
Myeloblasts%. Manual	NM	747-6	Myeloblasts%. Manual	LN	747-6 ^ Myeloblasts%. Manual ^LN
Monoblasts%. Manual	NM	33840-0	Monoblasts%. Manual	LN	33840-0 ^ Monoblasts%. Manual ^ LN
Lymphoblasts%. Manual	NM	33831-9	Lymphoblasts%. Manual	LN	33831-9 ^Lymphoblasts%. Manual ^LN
IMG/Blast%	NM	10048	IMG/Blast%	99MRC	10048 ^ IMG/Blast% ^99MRC
Prolymphocytes%. Manual	NM	6746-2	Prolymphocytes%. Manual	LN	6746-2 ^ Prolymphocytes%. Manual ^LN
Promonocytes%. Manual	NM	13599-6	Promonocytes%. Manual	LN	13599-6 ^ Promonocytes%. Manual ^ LN
Plsm-cell%	NM	40492-1	Plsm-cell%	99MRC	40492-1 ^ Plsm-cell% ^99MRC
FR-CRP	NM	71426-1	FR-CRP	LN	71426-1 ^ FR-CRP ^LN
hs-CRP	NM	71426-1-1	hs-CRP	99MRC	71426-1-1 ^ hs-CRP ^ 99MRC

CRP	NM	71426-1-2	CRP	99MRC	71426-1-2 ^ CRP ^ 99MRC
CRP_DEFAULT_CORRECTED	NM	910082	CRP Default Corrected	99MRC	910082 ^ CRP Default Corrected ^ 99MRC
WBC-O	NM	10051	WBC-O	99MRC	10051 ^ WBC-O ^99MRC
TNC-D	NM	10052	TNC-D	99MRC	10052 ^ TNC-D ^99MRC
TNC-B	NM	10089	TNC-B	99MRC	10089^TNC-B^99MRC
IME#	NM	10053	IME#	99MRC	10053 ^ IME# ^99MRC
IME%	NM	10054	IME%	99MRC	10054 ^ IME% ^99MRC
H-NR%	NM	10055	H-NR%	99MRC	10055 ^ H-NR% ^99MRC
L-NR%	NM	10056	L-NR%	99MRC	10056 ^ L-NR% ^99MRC
NLR	NM	10057	NLR	99MRC	10057 ^ NLR ^99MRC
PLR	NM	10058	PLR	99MRC	10058 ^ PLR ^99MRC
TNC-N	NM	10059	TNC-N	99MRC	10059 ^ TNC-N ^99MRC
RPI	NM	10060	RPI	99MRC	10060 ^ RPI ^99MRC
H-IPF	NM	10061	H-IPF	99MRC	10061 ^ H-IPF ^99MRC
IPF#	NM	10062	IPF#	99MRC	10062 ^ IPF# ^99MRC
LY-BF#	NM	10063	LY-BF#	99MRC	10063^ LY-BF# ^99MRC
LY-BF%	NM	10064	LY-BF%	99MRC	10064 ^ LY-BF% ^99MRC
MO-BF#	NM	10065	MO-BF#	99MRC	10065 ^ MO-BF# ^99MRC
MO-BF%	NM	10066	MO-BF%	99MRC	10066 ^ MO-BF% ^99MRC
FRC#	NM	10067	FRC#	99MRC	10067 ^ FRC# ^99MRC
FRC%	NM	10068	FRC%	99MRC	10068 ^ FRC%^99MRC
Neu-X	NM	10069	Neu-X	99MRC	10069 ^ Neu-X ^99MRC
Neu-Y	NM	10070	Neu-Y	99MRC	10070 ^ Neu-Y ^99MRC
Neu-Z	NM	10071	Neu-Z	99MRC	10071 ^ Neu-Z ^99MRC
Lym-X	NM	10072	Lym-X	99MRC	10072 ^ Lym-X ^99MRC
Lym-Y	NM	10073	Lym-Y	99MRC	10073^ Lym-Y ^99MRC
Lym-Z	NM	10074	Lym-Z	99MRC	10074 ^ Lym-Z ^99MRC
Mon-X	NM	10075	Mon-X	99MRC	10075 ^ Mon-X ^99MRC
Mon-Y	NM	10076	Mon-Y	99MRC	10076 ^ Mon-Y ^99MRC
Mon-Z	NM	10077	Mon-Z	99MRC	10077 ^ Mon-Z ^99MRC
SRBC	NM	10078	SRBC	99MRC	10078 ^ SRBC ^99MRC
LRBC	NM	10079	LRBC	99MRC	10079 ^ LRBC ^99MRC
SMCV	NM	10080	SMCV	99MRC	10080 ^ SMCV ^99MRC
LMCV	NM	10081	LMCV	99MRC	10081 ^ LMCV ^99MRC

MCHR	NM	10082	MCHR	99MRC	10082 ^ MCHR ^99MRC
HDW	NM	10083	HDW	99MRC	10083 ^ HDW ^99MRC
MPC	NM	10084	MPC	99MRC	10084 ^ MPC ^99MRC
MPM	NM	10085	MPM	99MRC	10085 ^ MPM ^99MRC
HYPERPER	NM	10086	HYPERPER	99MRC	10086 ^ HYPERPER ^99MRC
HYPO	NM	10087	HYPO	99MRC	10087 ^ HYPO ^99MRC
MCVR	NM	17122	MCVr	99MRC	17122^MCVR ^99MRC
MCHM	NM	17123	MCHm	99MRC	17123^ MCHM^99MRC
DELTA_CH	NM	17124	DELTA-CH	99MRC	17124^DELTA_CH^99MRC
HYPO_CH_PER	NM	17125	HYPO-CH%	99MRC	17125^HYPO_CH_PER^99MRC
HYPER_CH_PER	NM	17126	HYPER-CH%	99MRC	17126^HYPER_CH_PER^99MRC
HGB_O	NM	17127	HGB-O	99MRC	17127^HGB-O^99MRC
HF_MCV	NM	17128	HF-MCV	99MRC	17128^HF_MCV^99MRC
HF_LYM	NM	17137-1	HF_Lym#	99MRC	17137-1 ^HF_LYM^99MRC
HF_LYM_PER	NM	17137-2	HF-Lym%	99MRC	17137-2 ^HF_LYM_PER^99MRC
UHF_LYM	NM	17138-1	UHF-Lym#	99MRC	17138-1 ^UHF_LYM^99MRC
UHF_LYM_PER	NM	17138-2	UHF-Lym%	99MRC	17138-2 ^UHF_LYM_PER^99MRC
HBA1C_PER	NM	17856-6	HbA1c%	LN	17856-6 ^ HbA1c% ^ LN
HBA1C_MONO-S	NM	10093	HbA1c-MonoS	99MRC	10093 ^ HbA1c-MonoS ^99MRC
HBA1C_IFCC	NM	59261-8	HbA1c-IFCC	LN	59261-8 ^ HbA1c-IFCC^ LN
HBF	NM	10090	HbF	99MRC	10090 ^ HbF^99MRC
HBA1	NM	10091	HbA1	99MRC	10091 ^ HbA1^99MRC
EAG	NM	10092	eAG	99MRC	10092 ^ eAG^99MRC
Custom Parameters	NM	10098	Custom	99CUS	Format: Code-Custom parameter name ^ Custom parameter name ^99CUS

					Example: 10098-Custom parameter name ^ Custom parameter name ^99CUS
SAA	NM	10099	SAA	99MRC	10099 ^ SAA^99MRC
SAA/CRP	NM	10100	SAA/CRP	99MRC	10100 ^ SAA/CRP^99MRC
Neu#&	NM	17100-1	Neu#&	99MRC	17100-1 ^ Neu#&^99MRC
Neu%&	NM	17100-2	Neu%&	99MRC	17100-2 ^ Neu%&^99MRC
Lym#&	NM	17101-1	Lym#&	99MRC	17101-1 ^ Lym#&^99MRC
Lym%&	NM	17101-2	Lym%&	99MRC	17101-2 ^ Lym%&^99MRC
Neu-XW	NM	17102-1	Neu-XW	99MRC	17102-1 ^ Neu-XW ^99MRC
Neu-YW	NM	17102-2	Neu-YW	99MRC	17102-2 ^ Neu-YW ^99MRC
Neu-ZW	NM	17103-3	Neu-ZW	99MRC	17102-3 ^ Neu-ZW ^99MRC
Lym-XW	NM	17104-1	Lym-XW	99MRC	17104-1 ^ Lym-XW ^99MRC
Lym-YW	NM	17104-2	Lym-YW	99MRC	17104-2 ^ Lym-YW ^99MRC
Lym-ZW	NM	17104-3	Lym-ZW	99MRC	17104-3 ^ Lym-ZW ^99MRC
Mon-XW	NM	17105-1	Mon-XW	99MRC	17105-1 ^ Mon-XW ^99MRC
Mon-YW	NM	17105-2	Mon-YW	99MRC	17105-2 ^ Mon-YW ^99MRC
Mon-ZW	NM	17105-3	Mon-ZW	99MRC	17105-3 ^ Mon-ZW ^99MRC
RET-Y	NM	17106-1	RET-Y	99MRC	17106-1 ^ RET-Y ^99MRC
RET-X	NM	17106-2	RET-X	99MRC	17106-2 ^ RET-X ^99MRC
IRF-Y	NM	17107-1	IRF-Y	99MRC	17107-1 ^ IRF-Y ^99MRC

IRF-X	NM	17107-2	IRF-X	99MRC	17107-2 ^ IRF-X ^99MRC
RET-RBC-Y	NM	17108-1	RET-RBC-Y	99MRC	17108-1 ^ RET-RBC-Y ^99MRC
RET-RBC-X	NM	17108-2	RET-RBC-X	99MRC	17108-2 ^ RET-RBC-X ^99MRC
PLT-H	NM	17109	PLT-H	99MRC	17109 ^ PLT-H ^99MRC
IPF-D	NM	17110	IPF-D	99MRC	17110 ^ IPF-D ^99MRC
RET%-D	NM	17111-1	RET%-D	99MRC	17111-1 ^ RET%-D ^99MRC
RET#-D	NM	17111-2	RET#-D	99MRC	17111-2 ^ RET#-D ^99MRC
IRF-D	NM	17112	IRF-D	99MRC	17112 ^ IRF-D ^99MRC
LFR-D	NM	17113	LFR-D	99MRC	17113 ^ LFR-D ^99MRC
MFR-D	NM	17114	MFR-D	99MRC	17114 ^ MFR-D ^99MRC
HFR-D	NM	17115	HFR-D	99MRC	17115 ^ HFR-D ^99MRC
ESR-Corr.	NM	17116	ESR-Corr.	99MRC	17116 ^ ESR-Corr. ^99MRC
SA	NM	17117	SA	99MRC	17117 ^ SA ^99MRC
AMP	NM	17118	AMP	99MRC	17118 ^ AMP ^99MRC
AI	NM	17119	AI	99MRC	17119 ^ AI ^99MRC
MIN	NM	17120	MIN	99MRC	17120 ^ MIN ^99MRC
T1/2	NM	17121	T1/2	99MRC	17121 ^ T1/2 ^99MRC
ESR	NM	30341-2	ESR	LN	30341-2 ^ ESR ^99MRC
PCT	NM	17139	Poct Pct	99MRC	17139^Poct Pct^99MRC
IL-6	NM	17140	Poct IL-6	99MRC	17140^Poct IL-6^99MRC
MP IgM	NM	17141	Poct MP IgM	99MRC	17141^Poct MP IgM^99MRC
MP IgG	NM	17142	Poct MP IgG	99MRC	17142^Poct MP IgG^99MRC
Flu A	NM	17143	Poct Flu A	99MRC	17143^Poct Flu A^99MRC
Flu B	NM	17144	Poct Flu B	99MRC	17144^Poct Flu B^99MRC
CP IgM	NM	17145	Poct CP IgM	99MRC	17145^Poct CP IgM^99MRC
CP IgG	NM	17146	Poct CP IgG	99MRC	17146^Poct CP IgG^99MRC
ADV	NM	17147	Poct ADV	99MRC	17147^Poct ADV^99MRC
RSV	NM	17148	Poct RSV	99MRC	17148^Poct RSV^99MRC
PIV	NM	17149	Poct PIV	99MRC	17149^Poct PIV^99MRC

Intermediate data of analysis results (WBCs, RBCs, PLTs histograms, scatter diagram data, etc.)					
RBC histogram binary data	ED	15050	RBC Histogram. Binary	99MRC	15050^RBC Histogram. Binary^99MRC
Left discriminator of the RBC histogram	NM	15051	RBC Histogram. Left Line	99MRC	15051^RBC Histogram. Left Line^99MRC
Right discriminator of the RBC histogram	NM	15052	RBC Histogram. Right Line	99MRC	15052^RBC Histogram. Right Line^99MRC
RBC histogram metadata length	NM	15053	RBC Histogram. Binary Meta Length	99MRC	15053^RBC Histogram. Binary Meta Length^99MRC
RBC histogram left discriminator adjusted flag	IS	15054	RBC Histogram. Left Line Adjusted	99MRC	15054^RBC Histogram. Left Line Adjusted^99MRC
RBC histogram right discriminator adjusted flag	IS	15055	RBC Histogram. Right Line Adjusted	99MRC	15055^RBC Histogram. Right Line Adjusted^99MRC
RBC histogram bitmap data	ED	15056	RBC Histogram. BMP	99MRC	15056^RBC Histogram. BMP^99MRC
Total RBC Histograms	NM	15057	RBC Histogram. Total	99MRC	15057^RBC Histogram. Total^99MRC
PLT histogram binary data	ED	15100	PLT Histogram. Binary	99MRC	15100^PLT Histogram. Binary^99MRC
Left discriminator of the PLT histogram	NM	15111	PLT Histogram. Left Line	99MRC	15111^PLT Histogram. Left Line^99MRC
Right	NM	15112	PLT	99MRC	15112^PLT Histogram.

discriminator of the PLT histogram			Histogram. Right Line		Right Line^99MRC
PLT histogram metadata length	NM	15113	PLT Histogram. Binary Meta Length	99MRC	15113^PLT Histogram. Binary Meta Length^99MRC
PLT histogram left discriminator adjusted flag	IS	15114	PLT Histogram. Left Line Adjusted	99MRC	15114^PLT Histogram. Left Line Adjusted^99MRC
PLT histogram right discriminator adjusted flag	IS	15115	PLT Histogram. Right Line Adjusted	99MRC	15115^PLT Histogram. Right Line Adjusted^99MRC
PLT histogram bitmap data	ED	15116	PLT Histogram. BMP	99MRC	15116^PLT Histogram. BMP^99MRC
PLT Histograms	NM	15117	PLT Histogram. Total	99MRC	15117^PLT Histogram. Total^99MRC
WBC histogram binary data (intermediate data)	NM	15000	WBC Histogram. Binary	99MRC	15000^ WBC Histogram. Binary^99MRC
Left discriminator of the WBC histogram	NM	15001	WBC Histogram. Left Line	99MRC	15001^ WBC Histogram. Left Line ^99MRC
Right discriminator of the WBC histogram	NM	15002	WBC Histogram. Right Line	99MRC	15002^ WBC Histogram. Right Line ^99MRC
Middle discriminator of WBC histogram	NM	15003	WBC Histogram. Middle Line	99MRC	15003^ WBC Histogram. Middle Line ^99MRC

WBC histogram metadata length	NM	15004	WBC Histogram. Meta Length	99MRC	15004^ WBC Histogram. Meta Length ^99MRC
WBC histogram left discriminator adjusted flag	NM	15005	WBC Histogram. Left Line Adjusted	99MRC	15005^ WBC Histogram. Left Line Adjusted ^99MRC
WBC histogram right discriminator adjusted flag	NM	15006	WBC Histogram. Right Line Adjusted	99MRC	15006^ WBC Histogram. Right Line Adjusted ^99MRC
WBC histogram middle discriminator adjusted flag	NM	15007	WBC Histogram. Middle Line Adjusted	99MRC	15007^ WBC Histogram. Middle Line Adjusted ^99MRC
WBC histogram bitmap data	NM	15008	WBC Histogram. BMP	99MRC	15008^ WBC Histogram. BMP ^99MRC
Total number of WBC histograms	NM	15009	WBC Histogram. Total	99MRC	15009^ WBC Histogram. Total ^99MRC
WBC LYM left discriminator	NM	15010	WBC Lym left line.	99MRC	15010^ WBC Lym left line.^99MRC
WBC LYM MID discriminator	NM	15011	WBC Lym Mid line.	99MRC	15011^ WBC Lym Mid line.^99MRC
WBC MID GRAN discriminator	NM	15012	WBC Mid Gran line.	99MRC	15012^ WBC Mid Gran line.^99MRC
WBC GRAN right discriminator	NM	15013	WBC Gran right line	99MRC	15013^ WBC Gran right line ^99MRC
PLT-H histogram binary data	NM	17300	PLT-H Histogram. Binary	99MRC	17300 ^ PLT-H Histogram. Binary ^99MRC

Left discriminator of the PLT-H histogram	NM	17301	PLT-H Histogram. Left Line	99MRC	17301 ^ PLT-H Histogram. Left Line ^99MRC
Right discriminator of the PLT-H histogram	NM	17302	PLT-H Histogram. Right Line	99MRC	17302 ^ PLT-H Histogram. Right Line ^99MRC
PLT-H historgram metadata length	NM	17303	PLT-H Histogram. Binary Meta Length	99MRC	17303 ^ PLT-H Histogram. Binary Meta Length ^99MRC
PLT-H histogram left discriminator adjusted flag	NM	17304	PLT-H Histogram. Left Line Adjusted	99MRC	17304 ^ PLT-H Histogram. Left Line Adjusted ^99MRC
PLT-H histogram right discriminator adjusted flag	NM	17305	PLT-H Histogram. Right Line Adjusted	99MRC	17305 ^ PLT-H Histogram. Right Line Adjusted ^99MRC
PLT-H histogram bitmap data	NM	17306	PLT-H Histogram. BMP	99MRC	17306 ^ PLT-H Histogram. BMP ^99MRC
Total PLT-H Histograms	NM	17307	PLT-H Histogram. Total	99MRC	17307 ^ PLT-H Histogram. Total ^99MRC
This interface draws the scatter diagram version information.	NM	15014	ScattergramParaVer	99MRC	15014^ScattergramParaVer^99MRC
Scatter diagram: Array of particle types to be grayed out.	ED	15015	ScattergramGraphicFlags	99MRC	15015^ScattergramGraphicFlags^99MRC

DIFF 2D scatter diagram bitmap data	ED	15200	WBC DIFF Scattergram. BMP	99MRC	15200^WBC DIFF Scattergram. BMP^99MRC
Diff scatter diagram metadata length	NM	15203	WBC DIFF Scattergram. Meta len	99MRC	15203^WBC DIFF Scattergram. Meta len^99MRC
Diff scatter diagram Fsc dimension size	NM	15205	WBC DIFF Scattergram. Fsc dimension	99MRC	15205^WBC DIFF Scattergram. Fsc dimension^99MRC
Diff scatter diagram Ssc dimension size	NM	15206	WBC DIFF Scattergram. Ssc dimension	99MRC	15206^WBC DIFF Scattergram. Ssc dimension^99MRC
Diff scatter diagram FL dimension	NM	15207	WBC DIFF Scattergram. FL dimension	99MRC	15207^WBC DIFF Scattergram. FL dimension^99MRC
DIFF scatter diagram FSC－LOG dimension size	NM	15208	WBC DIFF Scattergram. FSC-LOG dimension	99MRC	15208^WBC DIFF Scattergram. FSC-LOG dimension^99MRC
DIFF scatter diagram collection multiple	NM	15209	WBC DIFF MultipleType	99MRC	15209^WBC DIFF MultipleType^99MRC
Diff scatter diagram binary data	ED	15201	WBC DIFF Scattergram. BIN	99MRC	15201^WBC DIFF Scattergram. BIN^99MRC
DIFF-EXT scatter diagram bitmap data	NM	17308	DIFF-EXT Scattergram. BMP	99MRC	17308^ DIFF-EXT Scattergram. BMP^99MRC
DIFF-FsFl scatter diagram bitmap data	NM	17309	DIFF-FsFl Scattergram. BMP	99MRC	17309^ DIFF-FsFl Scattergram. BMP^99MRC

DIFF-FsSs scatter diagram bitmap data	NM	17310	DIFF-FsSs Scattergram. BMP	99MRC	17310^ DIFF-FsSs Scattergram. BMP^99MRC
BASO 2D scatter diagram bitmap data	ED	15250	Baso Scattergram. BMP	99MRC	15250^Baso Scattergram. BMP^99MRC
Baso scatter diagram binary data	ED	15251	Baso Scattergram. BIN	99MRC	15251^Baso Scattergram. BIN^99MRC
Baso scatter diagram metadata length	NM	15253	Baso Scattergram. Meta Len	99MRC	15253^Baso Scattergram. Meta Len^99MRC
Baso scatter diagram Fsc dimension size	NM	15255	Baso Scattergram. Fsc dimension	99MRC	15255^Baso Scattergram. Fsc dimension^99MRC
Baso scatter diagram Ssc dimension size	NM	15256	Baso Scattergram. Ssc dimension	99MRC	15256^Baso Scattergram. Ssc dimension^99MRC
Baso scatter diagram FL dimension size	NM	15257	Baso Scattergram. FL dimension	99MRC	15257^Baso Scattergram. FL dimension^99MRC
Baso scatter diagram FSC-LOG dimension size	NM	15258	Baso Scattergram. FSC-LOG dimension	99MRC	15258^Baso Scattergram. FSC-LOG dimension^99MRC
RET 2D scatter diagram bitmap data	ED	15300	RET Scattergram. BMP	99MRC	15300^RET Scattergram. BMP^99MRC
PLT-O 2D	ED	15301	PLT-O	99MRC	15301^PLT-O

scatter diagram bitmap data			Scattergram. BMP		Scattergram. BMP^99MRC
RET-EXT 2D scatter diagram bitmap data	ED	15302	RET-EXT Scattergram. BMP	99MRC	15302^RET-EXT Scattergram. BMP^99MRC
RET scatter diagram Fsc dimension size	NM	15303	RET Scattergram. Fsc dimension	99MRC	15303^RET Scattergram. Fsc dimension^99MRC
RET scatter diagram Ssc dimension	NM	15304	RET Scattergram. Ssc dimension	99MRC	15304^RET Scattergram. Ssc dimension^99MRC
RET scatter diagram FL dimension size	NM	15305	RET Scattergram. FL dimension	99MRC	15305^RET Scattergram. FL dimension^99MRC
RET scatter diagram binary data	ED	15306	RET Scattergram. BIN	99MRC	15306^RET Scattergram. BIN^99MRC
RET scatter diagram metadata length	NM	15307	RET Scattergram. Meta Len	99MRC	15307^RET Scattergram. Meta Len^99MRC
RET scatter diagram FSC-LOG dimension size	NM	15308	RET Scattergram FSC-LOG dimension	99MRC	15308^RET Scattergram FSC-LOG dimension^99MRC
PLTO scatter diagram binary data	ED	15309	PLTO Scattergram. BIN	99MRC	15309^PLTO Scattergram. BIN^99MRC
PLTO scatter diagram collection multiple	NM	15310	PLTO MultipleType	99MRC	15310^PLTO MultipleType^99MRC
PLTO scatter diagram	NM	15311	PLTO Scattergram.	99MRC	15311^PLTO Scattergram. Meta Len^99MRC

metadata length			Meta Len		
NRBC 2D scatter diagram bitmap data	ED	15350	NRBC Scattergram. BMP	99MRC	15350^NRBC Scattergram. BMP^99MRC
NRBC scatter diagram Fsc dimension size	NM	15351	NRBC Scattergram. Fsc dimension		15351^NRBC Scattergram. Fsc dimension^99MRC
NRBC scatter diagram Ssc dimension size	NM	15352	NRBC Scattergram. Ssc dimension	99MRC	15352^NRBC Scattergram. Ssc dimension^99MRC
NRBC scatter diagram FL dimension size	NM	15353	NRBC Scattergram. FL dimension	99MRC	15353^NRBC Scattergram. FL dimension^99MRC
NRBC scatter diagram binary data	ED	15354	NRBC Scattergram. BIN	99MRC	15354^NRBC Scattergram. BIN^99MRC
NRBC scatter diagram metadata length	NM	15355	NRBC Scattergram. Meta Len	99MRC	15355^NRBC Scattergram. Meta Len^99MRC
NRBC scatter diagram FSC-LOG dimension size	NM	15356	NRBC Scattergram FSC-LOG dimension	99MRC	15356^NRBC Scattergram FSC-LOG dimension^99MRC
WNB 2D scatter diagram bitmap data	ED	15600	WNB Scattergram. BMP	99MRC	15600^WNB Scattergram. BMP^99MRC
WNB scatter diagram Fsc dimension size	NM	15601	WNB Scattergram. Fsc dimension		15601^WNB Scattergram. Fsc dimension^99MRC
WNB scatter	NM	15602	WNB	99MRC	15602^WNB Scattergram.

diagram Ssc dimension size			Scattergram. Ssc dimension		Ssc dimension^99MRC
WNB scatter diagram FL dimension size	NM	15603	WNB Scattergram. FL dimension	99MRC	15603^WNB Scattergram. FL dimension^99MRC
WNB scatter diagram binary data	ED	15604	WNB Scattergram. BIN	99MRC	15604^WNB Scattergram. BIN^99MRC
WNB scatter diagram metadata length	NM	15605	WNB Scattergram. Meta Len	99MRC	15605^WNB Scattergram. Meta Len^99MRC
WNB scatter diagram FSC-LOG dimension size	NM	15606	WNB Scattergram FSC-LOG dimension	99MRC	15606^WNB Scattergram FSC-LOG dimension^99MRC
RBCVHF scatter diagram bitmap data	ED	15700	RBCVHF Scattergram. BMP	99MRC	15700^RBCVHF Scattergram. BMP^99MRC
RBCVHF scatter diagram HC dimension size	NM	15703	RBCVHF Scattergram HC dimension	99MRC	15703^RBCVHF Scattergram HC dimension^99MRC
RBCVHF scatter diagram VOL dimension size	NM	15704	RBCVHF Scattergram. VOL dimension	99MRC	15704^RBCVHF Scattergram. VOL dimension^99MRC
RBCSCT scatter diagram bitmap data	ED	15800	RBCSCT Scattergram. BMP	99MRC	15800^RBCSCT Scattergram. BMP^99MRC
RBCSCT scatter	NM	15803	RBCSCT Scattergram	99MRC	15803^RBCSCT Scattergram FS

diagram FS dimension size			FS dimension		dimension^99MRC
RBCSCT scatter diagram SS dimension size	NM	15804	RBCSCT Scattergram. SS dimension	99MRC	15804^RBCSCT Scattergram. SS dimension^99MRC
PLT-H scatter diagram bitmap data	ED	17311	PLT-H Scattergram. BMP	99MRC	17311^ PLT-H Scattergram. BMP^99MRC
PLT-H scatter diagram binary data	NM	17312	PLT-H Scattergram. BIN	99MRC	17312^ PLT-H Scattergram. BIN^99MRC
PLT-H scatter diagram metadata length	NM	17313	PLT-H Scattergram. Meta len	99MRC	17313^ PLT-H Scattergram. Meta len^99MRC
PLT-H scatter diagram Fsc dimension size	NM	17314	PLT-H Scattergram. Fsc dimension	99MRC	17314^ PLT-H Scattergram. Fsc dimension^99MRC
PLT-H scatter diagram Ssc dimension size	NM	17315	PLT-H Scattergram. Ssc dimension	99MRC	17315^ PLT-H Scattergram. Ssc dimension^99MRC
PLT-H scatter diagram FL dimension size	NM	17316	PLT-H Scattergram. FL dimension	99MRC	17316^ PLT-H Scattergram. FL dimension^99MRC
Intermediate data of test results (chromatogram, chromatogram peak data, etc.)					
Chromatogram binary data	ED	15400	Chromatogram Wave Binary	99MRC	15400^Chromatogram Wave Binary^99MRC
Chromatogram waveform data metadata length	NM	15401	Chromatogram Wave Meta Length	99MRC	15401^Chromatogram Wave Meta Length^99MRC
Chromatogra	ED	15402	Chromatogra	99MRC	15402^Chromatogram

m baseline binary data			m Baseline Binary		Baseline Binary^99MRC
Chromatogram baseline data metadata length	NM	15403	Chromatogram Baseline Meta Length	99MRC	15403^Chromatogram Baseline Meta Length^99MRC
Maximum coordinate value on the horizontal axis of chromatogram	NM	15404	Chromatogram HOR. Max Axis	99MRC	15404^Chromatogram HOR. Max Axis^99MRC
Maximum coordinate value on the vertical axis of chromatogram	NM	15405	Chromatogram VER. Max Axis	99MRC	15405^Chromatogram VER. Max Axis^99MRC
Chromatogram bitmap data	ED	15406	Chromatogram BMP	99MRC	15406^Chromatogram BMP^99MRC
A1a peak retention time	NM	15407	Ala RTime	99MRC	15407^A1a RTime^99MRC
A1a peak area	NM	15408	Ala Area	99MRC	15408^A1a Area^99MRC
A1a peak area percentage	NM	15409	Ala Area Percent	99MRC	15409^A1a Area Percent^99MRC
A1b peak retention time	NM	15410	Alb RTime	99MRC	15410^A1b RTime^99MRC
A1b peak area	NM	15411	Alb Area	99MRC	15411^A1b Area^99MRC
A1b peak area percentage	NM	15412	Alb Area Percent	99MRC	15412^A1b Area Percent^99MRC
F peak retention time	NM	15413	F RTime	99MRC	15413^F RTime^99MRC
F peak area	NM	15414	F Area	99MRC	15414^F Area^99MRC
F peak area percentage	NM	15415	F Area Percent	99MRC	15415^F Area Percent^99MRC
LA1c peak retention time	NM	15416	LA1c RTime	99MRC	15416^L-A1c RTime^99MRC
LA1c peak area	NM	15417	LA1c Area	99MRC	15417^L-A1c Area^99MRC

LA1c peak area percentage	NM	15418	LA1c Area Percent	99MRC	15418^L-A1c Area Percent^99MRC
SA1c peak retention time	NM	15419	SA1c RTime	99MRC	15419^S-A1c RTime^99MRC
SA1c peak area	NM	15420	SA1c Area	99MRC	15420^S-A1c Area^99MRC
SA1c peak area percentage	NM	15421	SA1c Area Percent	99MRC	15421^S-A1c Area Percent^99MRC
A0 peak retention time	NM	15422	A0 RTime	99MRC	15422^A0 RTime^99MRC
A0 peak area	NM	15423	A0 Area	99MRC	15423^A0 Area^99MRC
A0 peak area percentage	NM	15424	A0 Area Percent	99MRC	15424^A0 Area Percent^99MRC
Total area of chromatographic peak	NM	15425	Total Area	99MRC	15425^Total Area^99MRC
P00 peak retention time	NM	15426	P00 RTime	99MRC	15426^P00 RTime^99MRC
P00 peak area	NM	15427	P00 Area	99MRC	15427^P00 Area^99MRC
P00 peak area percentage	NM	15428	P00 Area Percent	99MRC	15428^P00 Area Percent^99MRC
P01 peak retention time	NM	15429	P01 RTime	99MRC	15429^P01 RTime^99MRC
P01 peak area	NM	15430	P01 Area	99MRC	15430^P01 Area^99MRC
P01 peak area percentage	NM	15431	P01 Area Percent	99MRC	15431^P01 Area Percent^99MRC
P02 peak retention time	NM	15432	P02 RTime	99MRC	15432^P02 RTime^99MRC
P02 peak area	NM	15433	P02 Area	99MRC	15433^P02 Area^99MRC
P02 peak area percentage	NM	15434	P02 Area Percent	99MRC	15434^P02 Area Percent^99MRC
P03 peak retention time	NM	15435	P03 RTime	99MRC	15435^P03 RTime^99MRC
P03 peak area	NM	15436	P03 Area	99MRC	15436^P03 Area^99MRC
P03 peak area percentage	NM	15437	P03 Area Percent	99MRC	15437^P03 Area Percent^99MRC
P04 peak	NM	15438	P04 RTime	99MRC	15438^P04

retention time					RTime^99MRC
P04 peak area	NM	15439	P04 Area	99MRC	15439^P04 Area^99MRC
P04 peak area percentage	NM	15440	P04 Area Percent	99MRC	15440^P04 Area Percent^99MRC
P05 peak retention time	NM	15441	P05 RTime	99MRC	15441^P05 RTime^99MRC
P05 peak area	NM	15442	P05 Area	99MRC	15442^P05 Area^99MRC
P05 peak area percentage	NM	15443	P05 Area Percent	99MRC	15443^P05 Area Percent^99MRC
P06 peak retention time	NM	15444	P06 RTime	99MRC	15444^P06 RTime^99MRC
P06 peak area	NM	15445	P06 Area	99MRC	15445^P06 Area^99MRC
P06 peak area percentage	NM	15446	P06 Area Percent	99MRC	15446^P06 Area Percent^99MRC
P07 peak retention time	NM	15447	P07 RTime	99MRC	15447^P07 RTime^99MRC
P07 peak area	NM	15448	P07 Area	99MRC	15448^P07 Area^99MRC
P07 peak area percentage	NM	15449	P07 Area Percent	99MRC	15449^P07 Area Percent^99MRC
P08 peak retention time	NM	15450	P08 RTime	99MRC	15450^P08 RTime^99MRC
P08 peak area	NM	15451	P08 Area	99MRC	15451^P08 Area^99MRC
P08 peak area percentage	NM	15452	P08 Area Percent	99MRC	15452^P08 Area Percent^99MRC
P09 peak retention time	NM	15453	P09 RTime	99MRC	15453^P09 RTime^99MRC
P09 peak area	NM	15454	P09 Area	99MRC	15454^P09 Area^99MRC
P09 peak area percentage	NM	15455	P09 Area Percent	99MRC	15455^P09 Area Percent^99MRC
P10 peak retention time	NM	15456	P10 RTime	99MRC	15456^P10 RTime^99MRC
P10 peak area	NM	15457	P10 Area	99MRC	15457^P10 Area^99MRC
P10 peak area percentage	NM	15458	P10 Area Percent	99MRC	15458^P10 Area Percent^99MRC
P11 peak retention time	NM	15459	P11 RTime	99MRC	15459^P11 RTime^99MRC
P11 peak area	NM	15460	P11 Area	99MRC	15460^P11 Area^99MRC
P11 peak area percentage	NM	15461	P11 Area Percent	99MRC	15461^P11 Area Percent^99MRC

P12 peak retention time	NM	15462	P12 RTime	99MRC	15462^P12 RTime^99MRC
P12 peak area	NM	15463	P12 Area	99MRC	15463^P12 Area^99MRC
P12 peak area percentage	NM	15464	P12 Area Percent	99MRC	15464^P12 Area Percent^99MRC
P13 peak retention time	NM	15465	P13 RTime	99MRC	15465^P13 RTime^99MRC
P13 peak area	NM	15466	P13 Area	99MRC	15466^P13 Area^99MRC
P13 peak area percentage	NM	15467	P13 Area Percent	99MRC	15467^P13 Area Percent^99MRC
P14 peak retention time	NM	15468	P14 RTime	99MRC	15468^P14 RTime^99MRC
P14 peak area	NM	15469	P14 Area	99MRC	15469^P14 Area^99MRC
P14 peak area percentage	NM	15470	P14 Area Percent	99MRC	15470^P14 Area Percent^99MRC
P15 peak retention time	NM	15471	P15 RTime	99MRC	15471^P15 RTime^99MRC
P15 peak area	NM	15472	P15 Area	99MRC	15472^P15 Area^99MRC
P15 peak area percentage	NM	15473	P15 Area Percent	99MRC	15473^P15 Area Percent^99MRC
A1a peak start time	NM	15476	A1a Peak Start Time	99MRC	15476^ A1a Peak Start Time ^99MRC
A1a peak cutoff time	NM	15477	A1a Peak End Time	99MRC	15477^ A1a Peak End Time ^99MRC
A1b peak start time	NM	15478	A1b Peak Start Time	99MRC	15478^ A1b Peak Start Time ^99MRC
A1b peak cutoff time	NM	15479	A1b Peak End Time	99MRC	15479^ A1b Peak End Time ^99MRC
F peak start time	NM	15480	F Peak Start Time	99MRC	15480^ F Peak Start Time ^99MRC
Cut-off time of F peak	NM	15481	F Peak End Time	99MRC	15481^ F Peak End Time ^99MRC
LA1c peak start time	NM	15482	LA1c Peak Start Time	99MRC	15482^ LA1c Peak Start Time ^99MRC
LA1c peak cutoff time	NM	15483	LA1c Peak End Time	99MRC	15483^ LA1c Peak End Time ^99MRC
SA1c peak start time	NM	15484	SA1c Peak Start Time	99MRC	15484^ SA1c Peak Start Time ^99MRC
SA1c peak	NM	15485	SA1c Peak	99MRC	15485^ SA1c Peak End

cutoff time			End Time		Time ^99MRC
A0 peak start time	NM	15486	A0 Peak Start Time	99MRC	15486^ A0 Peak Start Time ^99MRC
A0 peak cut-off time	NM	15487	A0 Peak End Time	99MRC	15487^ A0 Peak End Time ^99MRC
P00 peak start time	NM	15488	P00 Peak Start Time	99MRC	15488^ P00 Peak Start Time ^99MRC
P00 peak cutoff time	NM	15489	P00 Peak End Time	99MRC	15489^ P00 Peak End Time ^99MRC
P01 peak start time	NM	15490	P01 Peak Start Time	99MRC	15490^ P01 Peak Start Time ^99MRC
P01 peak cutoff time	NM	15491	P01 Peak End Time	99MRC	15491^ P01 Peak End Time ^99MRC
P02 peak start time	NM	15492	P02 Peak Start Time	99MRC	15492^ P02 Peak Start Time ^99MRC
P02 peak cutoff time	NM	15493	P02 Peak End Time	99MRC	15493^ P02 Peak End Time ^99MRC
P03 peak start time	NM	15494	P03 Peak Start Time	99MRC	15494^ P03 Peak Start Time ^99MRC
P03 peak cutoff time	NM	15495	P03 Peak End Time	99MRC	15495^ P03 Peak End Time ^99MRC
P04 peak start time	NM	15496	P04 Peak Start Time	99MRC	15496^ P04 Peak Start Time ^99MRC
P04 peak cutoff time	NM	15497	P04 Peak End Time	99MRC	15497^ P04 Peak End Time ^99MRC
P05 peak start time	NM	15498	P05 Peak Start Time	99MRC	15498^ P05 Peak Start Time ^99MRC
P05 peak cutoff time	NM	15499	P05 Peak End Time	99MRC	15499^ P05 Peak End Time ^99MRC
P06 peak start time	NM	15500	P06 Peak Start Time	99MRC	15500^ P06 Peak Start Time ^99MRC
P06 peak cutoff time	NM	15501	P06 Peak End Time	99MRC	15501^ P06 Peak End Time ^99MRC
P07 peak start time	NM	15502	P07 Peak Start Time	99MRC	15502^ P07 Peak Start Time ^99MRC
P07 peak cutoff time	NM	15503	P07 Peak End Time	99MRC	15503^ P07 Peak End Time ^99MRC
P08 peak start time	NM	15504	P08 Peak Start Time	99MRC	15504^ P08 Peak Start Time ^99MRC

P08 peak cutoff time	NM	15505	P08 Peak End Time	99MRC	15505^ P08 Peak End Time ^99MRC
P09 peak start time	NM	15506	P09 Peak Start Time	99MRC	15506^ P09 Peak Start Time ^99MRC
P09 peak cutoff time	NM	15507	P09 Peak End Time	99MRC	15507^ P09 Peak End Time ^99MRC
P10 peak start time	NM	15508	P10 Peak Start Time	99MRC	15508^ P10 Peak Start Time ^99MRC
P10 peak cut-off time	NM	15509	P10 Peak End Time	99MRC	15509^ P10 Peak End Time ^99MRC
P11 peak start time	NM	15510	P11 Peak Start Time	99MRC	15510^ P11 Peak Start Time ^99MRC
P11 peak cut-off time	NM	15511	P11 Peak End Time	99MRC	15511^ P11 Peak End Time ^99MRC
P12 peak start time	NM	15512	P12 Peak Start Time	99MRC	15512^ P12 Peak Start Time ^99MRC
P12 peak cut-off time	NM	15513	P12 Peak End Time	99MRC	15513^ P12 Peak End Time ^99MRC
P13 peak start time	NM	15514	P13 Peak Start Time	99MRC	15514^ P13 Peak Start Time ^99MRC
P13 peak cutoff time	NM	15515	P13 Peak End Time	99MRC	15515^ P13 Peak End Time ^99MRC
P14 peak start time	NM	15516	P14 Peak Start Time	99MRC	15516^ P14 Peak Start Time ^99MRC
P14 peak cutoff time	NM	15517	P14 Peak End Time	99MRC	15517^ P14 Peak End Time ^99MRC
P15 peak start time	NM	15518	P15 Peak Start Time	99MRC	15518^ P15 Peak Start Time ^99MRC
P15 peak cut-off time	NM	15519	P15 Peak End Time	99MRC	15519^ P15 Peak End Time ^99MRC
Retention time of D peak	NM	15520	D RTime	99MRC	15520^ D RTime ^99MRC
D peak area	NM	15521	D Area	99MRC	15521^ D Area ^99MRC
D peak area percentage	NM	15522	D Area Percent	99MRC	15522^ D Area Percent ^99MRC
D peak start time	NM	15523	D Peak Start Time	99MRC	15523^ D Peak Start Time ^99MRC
Peak D	NM	15524	D Peak End	99MRC	15524^ D Peak End Time

cut-off time			Time		^99MRC
Retention time of S peak	NM	15525	S RTime	99MRC	15525^ S RTime ^99MRC
S peak area	NM	15526	S Area	99MRC	15526^ S Area ^99MRC
S peak area percentage	NM	15527	S Area Percent	99MRC	15527^ S Area Percent ^99MRC
S peak start time	NM	15528	S Peak Start Time	99MRC	15528^ S Peak Start Time ^99MRC
S peak cutoff time	NM	15529	S Peak End Time	99MRC	15529^ S Peak End Time ^99MRC
Retention time of C peak	NM	15530	C RTime	99MRC	15530^ C RTime ^99MRC
C peak area	NM	15531	C Area	99MRC	15531^ C Area ^99MRC
C peak area percentage	NM	15532	C Area Percent	99MRC	15532^ C Area Percent ^99MRC
C peak start time	NM	15533	C Peak Start Time	99MRC	15333^ C Peak Start Time ^99MRC
Peak C Cutoff Time	NM	15534	C Peak End Time	99MRC	15534^ C Peak End Time ^99MRC
Variant peak retention time	NM	15535	Variant RTime	99MRC	15535^ Variant RTime ^99MRC
Variant peak area	NM	15536	Variant Area	99MRC	15536^ Variant Area ^99MRC
Variant peak area percentage	NM	15537	Variant Area Percent	99MRC	15537^ Variant Area Percent ^99MRC
Variant peak start time	NM	15538	Variant Peak Start Time	99MRC	15538^ Variant Peak Start Time ^99MRC
Variant peak cutoff time	NM	15539	Variant Peak End Time	99MRC	15539^ Variant Peak End Time ^99MRC
Hema Review of WBCs	ED	15900	HemaScanningWbcGraph	99MRC	Format: Code-SN ^ HemaScanningWbcGraph-SN ^ 99MRC Example: 15900-1 ^HemaScanningWbcGraph-1 ^99MRC

Hema Review WBC Picture Cell Type	ST	15901	HemaScanningWbcCellType	99MRC	Format: Code-SN ^ HemaScanningWbcCellType - SN ^ 99MRC Example: 15901-1 ^HemaScanningWbcCellType -1 ^99MRC
Abnormal alarm information					
WBC scatter diagram abnormal	IS	12000	WBC Abnormal scattergram	99MRC	12000^WBC Abnormal scattergram^99MRC
Leukocytosis	IS	12002	Leucocytosis	99MRC	12002^Leucocytosis^99MRC
low white blood cell count	IS	12003	Leucopenia	99MRC	12003^Leucopenia^99MRC
Increased neutrophil granulocyte	IS	12004	Neutrophilia	99MRC	12004^Neutrophilia^99MRC
Decreased neutrophil granulocyte	IS	12005	Neutropenia	99MRC	12005^Neutropenia^99MRC
Lymphocytosis	IS	12006	Lymphocytosis	99MRC	12006^Lymphocytosis^99MRC
Lymphopenia	IS	12007	Lymphopenia	99MRC	12007^Lymphopenia^99MRC
Monocytosis	IS	12008	Monocytosis	99MRC	12008^Monocytosis^99MRC
Increased eosinophilic granulocyte	IS	12009	Eosinophilia	99MRC	12009^Eosinophilia^99MRC
Increased basophilic granulocyte	IS	12010	Basophilia	99MRC	12010^Basophilia^99MRC
Left shift?	IS	17790-7	WBC Left Shift?	LN	17790-7 ^WBC Left Shift?^LN
Immature granulocyte?	IS	34165-1	Imm Granulocytes?	LN	34165-1 ^Imm Granulocytes?^LN

Atypical lymphocytes?	IS	15192-8	Atypical Lymphs?	LN	15192-8 ^Atypical Lymphs?^LN
Anti-RBC?	IS	34525-6	rstRBC	LN	34525-6 ^rstRBC^LN
Polycythaemia	IS	12012	Erythrocytosis	99MRC	12012^Erythrocytosis^99MRC
Anisocytosis	IS	15150-6	Anisocytosis	LN	15150-6 ^Anisocytosis^LN
Macrocytic RBC	IS	12075	Macrocytes	99MRC	12075^Macrocytes^LN
Small cell RBC	IS	12076	Microcytes	99MRC	12076^Microcytes^LN
RBC doublet	IS	10379-6	RBC Dual Pop	LN	10379-6 ^RBC Dual Pop^LN
Anemia	IS	12014	Anemia	99MRC	12014^Anemia^99MRC
Hypochromia	IS	15180-3	Hypochromia	LN	15180-3 ^Hypochromia^LN
Turbidity/HGB Interference?	IS	12015	HGB Interfere	99MRC	12015^HGB Interfere^99MRC
Thrombocytosis	IS	12017	Thrombocytosis	99MRC	12017^Thrombocytosis^99MRC
Thrombocytopenia	IS	12018	Thrombopenia	99MRC	12018^Thrombopenia^99MRC
Platelet aggregation?	IS	7796-6	Platelet Clump?	LN	7796-6 ^Platelet Clump?^LN
Insufficient aspiration/abnormal sample	IS	12021	Sample Abnormal	99MRC	12021^Sample Abnormal^99MRC
Small Platelets	IS	32208-1	Platelets.small	LN	32208-1 ^Platelets.small^LN
Iron Deficiency?	IS	12024	Iron Deficiency	99MRC	12024^Iron Deficiency^99MRC
DIFF analysis abnormal	IS	12027	DIFF-CH Error	99MRC	12027^DIFF-CH Error^99MRC
Blast cell?	IS	44017-2	Blasts	LN	44017-2 ^Blasts^LN
RBC analysis abnormal	IS	12030	RBC-CH Error	99MRC	12030^RBC-CH Error^99MRC
RBC agglutination?	IS	50670-9	RBC Agglutination	LN	50670-9 ^ RBC Agglutination?^LN

			?		
PLT analysis abnormal	IS	12033	PLT-CH Error	99MRC	12033^PLT-CH Error^99MRC
BASO analysis abnormal	IS	12035	BASO-CH Error	99MRC	12035^BASO-CH Error^99MRC
RET analysis abnormal	IS	12039	RET-CH Error	99MRC	12039^RET-CH Error^99MRC
Reticulocyte scatter diagram abnormal	IS	12040	RET Abn Scattergram	99MRC	12040^RET Abn Scattergram^99MRC
Reticulocytosis	IS	12041	Reticulocytosis	99MRC	12041^Reticulocytosis^99MRC
NRBC analysis abnormal	IS	12043	NRBC-CH Error	99MRC	12043^NRBC-CH Error^99MRC
Nucleated Red Blood Cell scatter diagram abnormal	IS	12044	NRBC Abn Scattergram	99MRC	12044^NRBC Abn Scattergram^99MRC
Abnormal lymphocytes/ blasts?	IS	12053	Abn Lympho/ Blasts	99MRC	12053^Abn Lympho/ Blasts^99MRC
Nucleated Red Blood Cells?	IS	12054	NRBC?	99MRC	12054^NRBC?^99MRC
Lipid Particles?	IS	12055	Lipid Particles?	99MRC	12055^Lipid Particles? ^99MRC
Infected RBC?	IS	12056	Infected RBC?	99MRC	12056^Infected RBC? ^99MRC
Clogging	IS	12058	Clog	99MRC	12058^Clog^99MRC
RBC analysis abnormal	IS	12060	RBC-CH Error	99MRC	12060^RBC-CH Error^99MRC
HGB analysis abnormal	IS	12062	HGB-CH Error	99MRC	12062^HGB-CH Error^99MRC
Fragments?	IS	12063	Fragments	99MRC	12063^Fragments^99MRC
RBC	IS	12064	RBC	99MRC	12064^RBC Abnormal

histogram abnormal			Abnormal histogram		histogram^99MRC
PLT-O analysis abnormal	IS	12067	PLT-O-CH Erro	99MRC	12067^PLT-O-CH Erro^99MRC
PLT Histogram Abn.	IS	12068	PLT Abnormal histogram	99MRC	12068^PLT Abnormal histogram^99MRC
PLT scatter diagram abnormal	IS	12069	PLT Abn Scattergram	99MRC	12069^PLT Abn Scattergram^99MRC
Large platelets	IS	12070	Platelets.Large	99MRC	12070^Platelets.Large^99MRC
Platelets?	IS	12071	Platelets.Giant	99MRC	12071^Platelets.Giant^99MRC
system malfunction	IS	12072	System Error	99MRC	12072^System Error^99MRC
Status Restricted	IS	12073	Status Abn	99MRC	12073^Status Abn^99MRC
Three-series reduction	IS	12074	Pancytopenia	99MRC	12074^Pancytopenia ^99MRC
Presence of nucleated red blood cells	IS	34188-3	NRBC present	LN	34188-3 ^NRBC present^LN
CRP sample aspiration abnormal	IS	12021-1	CRP Sample Abnormal	99MRC	12021-1 ^CRP Sample Abnormal^99MRC
CRP analysis abnormal	IS	12080	CRP System Error	99MRC	12080^CRP System Error^99MRC
Hematocrit abnormal	IS	12081	CRP Abnormal HCT Calibrate	99MRC	12081^CRP Abnormal HCT Calibrate^99MRC
CRP latex reagent lot has not been calibrated	IS	12082	CRP New Latex not Calibrated	99MRC	12082^CRP New Latex not Calibrated^99MRC
Insufficient aspiration	IS	12101	Aspiration Abn	99MRC	12101^Aspiration Abn^99MRC

WNB analysis abnormal	IS	12102	WNB Analysis Abn	99MRC	12102^WNB Analysis Abn^99MRC
WNB scatter diagram abnormal	IS	12103	WNB Abn Scattergram	99MRC	12103^WNB Abn Scattergram^99MRC
WBC fragments?	IS	12104	WBC Fragments?	99MRC	12104^WBC Fragments?^99MRC
Aspiration abnormal	IS	12105	Aspiration Abnormal	99MRC	12105^Aspiration Abnormal^99MRC
Chromatogram area too high	IS	12083	High Area	99MRC	12083^ High Area ^99MRC
Chromatogram area too low	IS	12084	Low Area	99MRC	12084^ Low Area ^99MRC
Poor SA1c peak separation	IS	12085	SA1c Peak not properly separated	99MRC	12085^ SA1c Peak not properly separated^99MRC
HbA0 peak abnormal	IS	12086	HbA0 Peak Abn.	99MRC	12086^ HbA0 Peak Abn.^99MRC
Abnormal peak count	IS	12087	Peak Num Abn.	99MRC	12087^ Peak Num Abn.^99MRC
Abnormal chromatogram	IS	12088	Chro. Abn.	99MRC	12088^ Chro. Abn.^99MRC
SA1c retention time advanced	IS	12089	Early SA1c RTime.	99MRC	12089^ Early SA1c RTime.^99MRC
SA1c retention time delay	IS	12090	Late SA1c RTime.	99MRC	12090^ Late SA1c RTime.^99MRC
HbA0 retention time advanced	IS	12091	Early HbA0 RTime.	99MRC	12091^ Early HbA0 RTime.^99MRC
HbA0 retention time delay	IS	12092	Late HbA0 RTime.	99MRC	12092^ Late HbA0 RTime.^99MRC
Measurement not completed	IS	12093	Analysis not completed	99MRC	12093^ Analysis not completed ^99MRC
Abnormal	IS	12094	Signal Abn.	99MRC	12094^ Signal

signal					Abn.^99MRC
HbE Suspicious	IS	12095	Suspected HbE	99MRC	12095^ Suspected HbE ^99MRC
HbD Suspicious	IS	12096	Suspected HbD	99MRC	12096^ Suspected HbD ^99MRC
HbS Visible	IS	12097	HbS detected	99MRC	12097^ HbS detected ^99MRC
HbC Visible	IS	12098	HbC detected	99MRC	12098^ HbC detected ^99MRC
Suspected hemoglobin variant	IS	12099	Suspected Hb Variant	99MRC	12099^ Suspected Hb Variant ^99MRC
Prozone abnormal?	IS	12108	Prozone Abn?	99MRC	12108^ Prozone Abn? ^99MRC
SAA analysis abnormal	IS	12109	SAA Analysis Error	99MRC	12109^ SAA Analysis Error^99MRC
ESR analysis abnormal	IS	17200	ESR Analysis Error	99MRC	17200 ^ ESR Analysis Error ^99MRC
PLT-H histogram abnormal	IS	17201	PLT-H Abnormal histogram	99MRC	17201 ^ PLT-H Abnormal histogram ^99MRC
WBC low value	IS	12302	Low-value WBC	99MRC	12302^ Low-value WBC ^99MRC
Excessive sediment	IS	12303	Too many artefacts	99MRC	12303^ Too many artefacts ^99MRC
SAA latex reagent lot has not been calibrated	IS	17203	New SAA latex, no calibrate	99MRC	17203 ^ New SAA latex, no calibrate ^99MRC
Sample probe is clogged.	IS	17204	Sampling Probe Clogged	99MRC	17204 ^ Sampling Probe Clogged ^99MRC
Abnormal promyelocyte ?	IS	12110	Abn. promyelocyte ?	99MRC	12110^Abn. promyelocyte?^99MRC
Blood malignant cells?	IS	12111	Hematological malignant cells?	99MRC	12111^Hematological malignant cells?^99MRC
Reactive	IS	12112	Reactive	99MRC	12112 ^Reactive

lymphocyte - leaflet?			lymphocyte-infectious mononucleosis?		lymphocyte-infectious mononucleosis? ^99MRC
Insufficient aspiration of ESR sample	IS	17202	ESR Aspiration Abn	99MRC	17202^ESR Aspiration Abn ^99MRC
CRP measurement is interfered	IS	17205	CRP Analysis Interfere	99MRC	17205^CRP Analysis Interfere ^99MRC
SAA Measurement Interference	IS	17206	SAA Analysis Interfere	99MRC	17206^SAA Analysis Interfere ^99MRC
Alarm i-Message: The code is generated from the basic alarm. After the alarm code and name, add -IM. The value is the value type. For example, the i-Message code corresponding to the alarm code 44017 -2 ^Blasts^LN is 44017 -2 -IM^Blasts-IM^LN.					
Left shift?	NM	17790-7 -IM	WBC Left Shift?-IM	LN	17790-7 -IM^WBC Left Shift?-IM^LN
Immature granulocyte?	NM	34165-1 -IM	Imm Granulocytes? -IM	LN	34165-1 -IM^Imm Granulocytes?-IM^LN
Atypical lymphocytes?	NM	15192-8 -IM	Atypical Lymphs?-IM	LN	15192-8 -IM^Atypical Lymphs?-IM^LN
Anti-RBC?	NM	34525-6 -IM	rstRBC-IM	LN	34525-6 -IM^rstRBC-IM^ LN
Turbidity/HGB Interference?	NM	12015-IM	HGB Interfere-IM	99MRC	12015-IM^HGB Interfere-IM^99MRC
Platelet aggregation?	NM	7796-6 -IM	Platelet Clump?-IM	LN	7796-6 -IM^Platelet Clump?-IM^LN
Blast cell?	NM	44017-2 -IM	Blasts-IM	LN	44017-2 -IM^Blasts-IM^ LN
RBC agglutination?	NM	50670-9 -IM	RBC Agglutination ?-IM	LN	50670-9 -IM^RBC Agglutination?-IM^LN
Iron Deficiency?	NM	12024-IM	Iron Deficiency-I	99MRC	12024-IM^Iron Deficiency-IM^99MRC

			M		
Abnormal lymphocytes/ blasts?	NM	12053-IM	Abn Lympho/ Blasts-IM	99MRC	12053-IM^Abn Lympho/ Blasts-IM^99MRC
Nucleated Red Blood Cells?	NM	12054-IM	NRBC?-IM	99MRC	12054-IM^ NRBC?-IM ^99MRC
Lipid Particles?	NM	12055-IM	Lipid Particles?-IM	99MRC	12055-IM^Lipid Particles?-IM^99MRC
Infected RBC?	NM	12056-IM	Infected RBC?-IM	99MRC	12056-IM^Infected RBC?-IM^99MRC
Fragments?	NM	12063-IM	Fragments-IM	99MRC	12063-IM^ Fragments-IM ^99MRC
WBC fragments?	NM	12104-IM	WBC Fragments?-I M	99MRC	12104-IM^WBC Fragments?-IM^99MRC
Review Result					
Segmented neutrophil#	NM	16000-1	SNE#	99MRC	16000-1 ^ SNE# ^99MRC
Segmented neutrophil%	NM	16000-2	SNE%	99MRC	16000-2 ^ SNE% ^99MRC
Eosinophil#	NM	16001-1	EO#	99MRC	16001-1 ^ EO# ^99MRC
Eosinophil%	NM	16001-2	EO%	99MRC	16001-2 ^ EO% ^99MRC
Basophil#	NM	16002-1	BA#	99MRC	16002-1 ^ BA# ^99MRC
Basophil%	NM	16002-2	BA%	99MRC	16002-2 ^ BA% ^99MRC
Lymphocyte#	NM	16003-1	LY#	99MRC	16003-1 ^ LY# ^99MRC
Lymphocyte%	NM	16003-2	LY%	99MRC	16003-2 ^ LY% ^99MRC
Monocyte#	NM	16004-1	MO#	99MRC	16004-1 ^ MO# ^99MRC
Monocyte%	NM	16004-2	MO%	99MRC	16004-2 ^ MO% ^99MRC
Band neutrophil#	NM	16005-1	BNE#	99MRC	16005-1 ^ BNE# ^99MRC
Band neutrophil%	NM	16005-2	BNE%	99MRC	16005-2 ^ BNE% ^99MRC
Variant lymphocyte#	NM	16006-1	VLY#	99MRC	16006-1 ^ VLY# ^99MRC
Variant lymphocyte%	NM	16006-2	VLY%	99MRC	16006-2 ^ VLY% ^99MRC

Reactive lymphocyte#	NM	16007-1	RLY#	99MRC	16007-1 ^ RLY# ^99MRC
Reactive lymphocyte%	NM	16007-2	RLY%	99MRC	16007-2 ^ RLY% ^99MRC
Abnormal lymphocyte#	NM	16008-1	ALY#	99MRC	16008-1 ^ ALY# ^99MRC
Abnormal lymphocyte%	NM	16008-2	ALY%	99MRC	16008-2 ^ ALY% ^99MRC
Promyelocyte #	NM	16009-1	PMY#	99MRC	16009-1 ^ PMY# ^99MRC
Promyelocyte %	NM	16009-2	PMY%	99MRC	16009-2 ^ PMY% ^99MRC
Myelocyte#	NM	16010-1	MY#	99MRC	16010-1 ^ MY# ^99MRC
Myelocyte%	NM	16010-2	MY%	99MRC	16010-2 ^ MY% ^99MRC
Metamyelocyte#	NM	16011-1	MMY#	99MRC	16011-1 ^ MMY# ^99MRC
Metamyelocyte%	NM	16011-2	MMY%	99MRC	16011-2 ^ MMY% ^99MRC
Blast cell#	NM	16012-1	BL#	99MRC	16012-1 ^ BL# ^99MRC
Blast cell%	NM	16012-2	BL%	99MRC	16012-2 ^ BL% ^99MRC
Prolymphocyte#	NM	16013-1	PLY#	99MRC	16013-1 ^ PLY# ^99MRC
Prolymphocyte%	NM	16013-2	PLY%	99MRC	16013-2 ^ PLY% ^99MRC
Plasma cell#	NM	16014-1	PC#	99MRC	16014-1 ^ PC# ^99MRC
Plasma cell%	NM	16014-2	PC%	99MRC	16014-2 ^ PC% ^99MRC
Large granular lymphocyte#	NM	16015-1	LGLY#	99MRC	16015-1 ^ LGLY# ^99MRC
Large granular lymphocyte%	NM	16015-2	LGLY%	99MRC	16015-2 ^ LGLY% ^99MRC
Immature basophil#	NM	16016-1	IBO#	99MRC	16016-1 ^ IBO# ^99MRC
Immature	NM	16016-2	IBO%	99MRC	16016-2 ^ IBO% ^99MRC

basophil%					
Immature eosinophil#	NM	16017-1	IEO#	99MRC	16017-1 ^ IEO# ^99MRC
Immature eosinophil%	NM	16017-2	IEO%	99MRC	16017-2 ^ IEO% ^99MRC
Hairy cell#	NM	16018-1	HC#	99MRC	16018-1 ^ HC# ^99MRC
Hairy cell%	NM	16018-2	HC%	99MRC	16018-2 ^ HC% ^99MRC
Sezary cell#	NM	16019-1	SEC#	99MRC	16019-1 ^ SEC# ^99MRC
Sezary cell%	NM	16019-2	SEC%	99MRC	16019-2 ^ SEC% ^99MRC
Promonocyte #	NM	16020-1	PMO#	99MRC	16020-1 ^ PMO# ^99MRC
Promonocyte %	NM	16020-2	PMO%	99MRC	16020-2 ^ PMO% ^99MRC
Smudge cell#	NM	16021-1	SMU#	99MRC	16021-1 ^ SMU# ^99MRC
Smudge cell%	NM	16021-2	SMU%	99MRC	16021-2 ^ SMU% ^99MRC
Erythroblasts (NRBC) #	NM	16022-1	ERB#	99MRC	16022-1 ^ ERB# ^99MRC
Erythroblasts (NRBC)%	NM	16022-2	ERB%	99MRC	16022-2 ^ ERB% ^99MRC
Artefact#	NM	16023-1	ART#	99MRC	16023-1 ^ ART# ^99MRC
Artefact%	NM	16023-2	ART%	99MRC	16023-2 ^ ART% ^99MRC
Giant thrombocyte#	NM	16024-1	GT#	99MRC	16024-1 ^ GT# ^99MRC
Giant thrombocyte%	NM	16024-2	GT%	99MRC	16024-2 ^ GT% ^99MRC
Megakaryocyte#	NM	16025-1	MEK#	99MRC	16025-1 ^ MEK# ^99MRC
Megakaryocyte%	NM	16025-2	MEK%	99MRC	16025-2 ^ MEK% ^99MRC
Not classed#	NM	16026-1	NC#	99MRC	16026-1 ^ NC# ^99MRC
Not classed%	NM	16026-2	NC%	99MRC	16026-2 ^ NC% ^99MRC
Thrombocyte aggregate#	NM	16027-1	TAG#	99MRC	16027-1 ^ TAG# ^99MRC
Thrombocyte aggregate%	NM	16027-2	TAG%	99MRC	16027-2 ^ TAG% ^99MRC

Other#	NM	16028-1	OTH#	99MRC	16028-1 ^ OTH# ^99MRC
Other%	NM	16028-2	OTH%	99MRC	16028-2 ^ OTH% ^99MRC
Poikilocytosis	NM	16200-1	SPOC	99MRC	16200-1 ^ SPOC^99MRC
Poikilocytosis(percentage)	NM	16200-2	SPOC%	99MRC	16200-2 ^ SPOC%^99MRC
Teardrop cells	NM	16201-1	STD	99MRC	16201-1 ^ STD^99MRC
Teardrop cells(percentage)	NM	16201-2	STD%	99MRC	16201-2 ^ STD%^99MRC
Elliptocytes	NM	16202-1	SELC	99MRC	16202-1 ^ SELC^99MRC
Elliptocytes%	NM	16202-2	SELC%	99MRC	16202-2 ^ SELC%^99MRC
Ovalocytes	NM	16203-1	SOVC	99MRC	16203-1 ^ SOVC^99MRC
Ovalocytes%	NM	16203-2	SOVC%	99MRC	16203-2 ^ SOVC%^99MRC
Sickle cells	NM	16204-1	SSI	99MRC	16204-1 ^ SSI^99MRC
Sickle cells%	NM	16204-2	SSI%	99MRC	16204-2 ^ SSI%^99MRC
Schistocytes	NM	16205-1	SSCC	99MRC	16205-1 ^ SSCC^99MRC
Schistocytes%	NM	16205-2	SSCC%	99MRC	16205-2 ^ SSCC%^99MRC
Helmet cells	NM	16206-1	SHE	99MRC	16206-1 ^ SHE^99MRC
Helmet cells%	NM	16206-2	SHE%	99MRC	16206-2 ^ SHE%^99MRC
Acanthocytes	NM	16207-1	SACC	99MRC	16207-1 ^ SACC^99MRC
Acanthocytes%	NM	16207-2	SACC%	99MRC	16207-2 ^ SACC%^99MRC
Echinocytes	NM	16208-1	SECC	99MRC	16208-1 ^ SECC^99MRC
Echinocytes%	NM	16208-2	SECC%	99MRC	16208-2 ^ SECC%^99MRC
Stomatocytes	NM	16209-1	SSTC	99MRC	16209-1 ^ SSTC^99MRC
Stomatocytes%	NM	16209-2	SSTC%	99MRC	16209-2 ^ SSTC%^99MRC
Target cells	NM	16210-1	STA	99MRC	16210-1 ^ STA^99MRC
Target cells%	NM	16210-2	STA%	99MRC	16210-2 ^ STA%^99MRC
Spherocytes	NM	16211-1	SSPC	99MRC	16211-1 ^ SSPC^99MRC
Spherocytes%	NM	16211-2	SSPC%	99MRC	16211-2 ^ SSPC%^99MRC
Basophilic stippling	NM	16212-1	IBST	99MRC	16212-1 ^ IBST^99MRC
Basophilic	NM	16212-2	IBST%	99MRC	16212-2 ^ IBST%^99MRC

stippling%					
Pappenheimer bodies	NM	16213-1	IPAB	99MRC	16213-1 ^ IPAB^99MRC
Pappenheimer bodies%	NM	16213-2	IPAB%	99MRC	16213-2 ^ IPAB%^99MRC
Howell-Jolly bodies	NM	16214-1	IHJB	99MRC	16214-1 ^ IHJB^99MRC
Howell-Jolly bodies%	NM	16214-2	IHJB%	99MRC	16214-2 ^ IHJB%^99MRC
Parasites	NM	16215-1	IPAR	99MRC	16215-1 ^ IPAR^99MRC
Parasites%	NM	16215-2	IPAR%	99MRC	16215-2 ^ IPAR%^99MRC
Hypochromatic cells	NM	16216-1	CHYP	99MRC	16216-1 ^ CHYP^99MRC
Hypochromatic cells%	NM	16216-2	CHYP%	99MRC	16216-2 ^ CHYP%^99MRC
Polychromatic cells	NM	16217-1	CPOL	99MRC	16217-1 ^ CPOL^99MRC
Polychromatic cells%	NM	16217-2	CPOL%	99MRC	16217-2 ^ CPOL%^99MRC
Anisocytosis	NM	16218-1	ZANI	99MRC	16218-1 ^ ZANI^99MRC
Anisocytosis%	NM	16218-2	ZANI%	99MRC	16218-2 ^ ZANI%^99MRC
Microcytes	NM	16219-1	ZMIC	99MRC	16219-1 ^ ZMIC^99MRC
Microcytes%	NM	16219-2	ZMIC%	99MRC	16219-2 ^ ZMIC%^99MRC
Macrocytes	NM	16220-1	ZMAC	99MRC	16220-1 ^ ZMAC^99MRC
Macrocytes%	NM	16220-2	ZMAC%	99MRC	16220-2 ^ ZMAC%^99MRC
PLT/HPF Mean	NM	16400	AVG	99MRC	16400^ AVG^99MRC
Estimated Platelet Value	NM	16401	EST	99MRC	16401^ EST^99MRC
Platelet concentration level	NM	16402	LVL	99MRC	16402^ LVL^99MRC
Lab	NM	16403	Sender Facility	99MRC	16403^ Sender Facility ^99MRC
WBC count	NM	16404	WBC Count	99MRC	16404^ WBC Count ^99MRC

WBC Results	NM	16405	WBCCONFIRM	99MRC	16405^ WBCCONFIRM ^99MRC
RBC Result Confirmation	NM	16406	RBCCONFIRM	99MRC	16406^ RBCCONFIRM ^99MRC
PLT Result Confirmation	NM	16407	PLTCONFIRM	99MRC	16407^ PLTCONFIRM ^99MRC
Mindray Review Results					
Neutrophil segmented granulocyte percentage	NM	16701-1	Seg-Neur%	99MRC	16701-1 ^Seg-Neur%^99MRC
Neutrophil segmented granulocyte number	NM	16701-2	Seg-Neur#	99MRC	16701-2 ^Seg-Neur#^99MRC
Reactive lymphocyte * percentage	NM	16702-1	R-Lymr%	99MRC	16702-1 ^R-Lymr%^99MRC
Number of reactive lymphocytes *	NM	16702-2	R-Lymr#	99MRC	16702-2 ^R-Lymr#^99MRC
Promyelocyte percentage	NM	16703-1	Pro-Myer%	99MRC	16703-1 ^Pro-Myer%^99MRC
Promyelocyte number	NM	16703-2	Pro-Myer#	99MRC	16703-2 ^Pro-Myer#^99MRC
Plasma cells Percentage	NM	16704-1	Plasmar%	99MRC	16704-1 ^Plasmar%^99MRC
Plasma cells Quantity	NM	16704-2	Plasmar#	99MRC	16704-2 ^Plasmar#^99MRC
Unclassified Percentage	NM	16705-1	Unidentified%	99MRC	16705-1 ^Unidentified%^99MRC
Unclassified quantity	NM	16705-2	Unidentified#	99MRC	16705-2 ^Unidentified#^99MRC
Myelocyte percentage	NM	16706-1	Myer%	99MRC	16706-1 ^Myer%^99MRC
Myelocyte number	NM	16706-2	Myer#	99MRC	16706-2 ^Myer#^99MRC
Monocyte percentage	NM	16707-1	Monr%	99MRC	16707-1 ^Monr%^99MRC

Monocyte number	NM	16707-2	Monr#	99MRC	16707-2 ^Monr#^99MRC
Metamyelocyte percentage	NM	16708-1	Meta-Myer%	99MRC	16708-1 ^Meta-Myer%^99MRC
Metamyelocyte number	NM	16708-2	Meta-Myer#	99MRC	16708-2 ^Meta-Myer#^99MRC
Lymphocyte percentage	NM	16709-1	Lymr%	99MRC	16709-1 ^Lymr%^99MRC
Lymphocyte number	NM	16709-2	Lymr#	99MRC	16709-2 ^Lymr#^99MRC
Eosinophilic granulocyte Percentage	NM	16710-1	Eosr%	99MRC	16710-1 ^Eosr%^99MRC
Eosinophilic granulocyte Quantity	NM	16710-2	Eosr#	99MRC	16710-2 ^Eosr#^99MRC
Blast cell percentage	NM	16711-1	Blastr%	99MRC	16711-1 ^Blastr%^99MRC
Blast cell number	NM	16711-2	Blastr#	99MRC	16711-2 ^Blastr#^99MRC
Basophilic granulocyte Percentage	NM	16712-1	Basr%	99MRC	16712-1 ^Basr%^99MRC
Basophilic granulocyte Quantity	NM	16712-2	Basr#	99MRC	16712-2 ^Basr#^99MRC
Neutral horseshoe-shaped nucleus percentage	NM	16713-1	Band-Neur%	99MRC	16713-1 ^Band-Neur%^99MRC
Neutral horseshoe-shaped nucleus Quantity	NM	16713-2	Band-Neur#	99MRC	16713-2 ^Band-Neur#^99MRC
Abnormal promyelocyte percentage	NM	16714-1	Abn-Promyer%	99MRC	16714-1 ^Abn-Promyer%^99MRC
Abnormal Promyelocyte Number	NM	16714-2	Abn-Promyer#	99MRC	16714-2 ^Abn-Promyer#^99MRC
Abnormal lymphocyte percentage	NM	16715-1	Abn-Lymr%	99MRC	16715-1 ^Abn-Lymr%^99MRC
Number of	NM	16715-2	Abn-Lymr#	99MRC	16715-2

abnormal lymphocytes					^Abn-Lymr#^99MRC
Giant Platelet Count	NM	16716-1	G-PLT#	99MRC	16716-1 ^G-PLT#^99MRC
Percentage of smearing cells	NM	16717-1	Smudge%	99MRC	16717-1 ^Smudge%^99MRC
Number of smearing cells	NM	16717-2	Smudge#	99MRC	16717-2 ^Smudge#^99MRC
Nucleated Red Blood Cell percentage	NM	16718-1	NRBC%	99MRC	16718-1 ^NRBC%^99MRC
Nucleated Red Blood Cell count	NM	16718-2	NRBC#	99MRC	16718-2 ^NRBC#^99MRC
Platelet aggregation	NM	16719-1	PLT clumps#	99MRC	16719-1 ^PLT clumps#^99MRC
Platelets	NM	16720-1	L-PLT#	99MRC	16720-1 ^L-PLT#^99MRC
Sediment quantity	NM	16721-1	Artefacts#	99MRC	16721-1 ^Artefacts#^99MRC
Megakaryocyte number	NM	16722-1	Meg#	99MRC	16722-1 ^Meg#^99MRC
Megakaryocyte percentage	NM	16722-2	Meg%	99MRC	16722-2 ^Meg%^99MRC
Estimated Platelet Value	NM	16723	EST	99MRC	16723^EST^99MRC
Path of Mindray Review Images	ST	16724	ScanningGraph Path	99MRC	16724^ScanningGraph Path^99MRC
Mindray Review Leukocyte Image Name	ST	16725-1	Scanning WBC Graph Name	99MRC	16725-1-1 ^Scanning WBC Graph Name -1 ^99MRC
Mindray review WBC image data	ED	16725-2	Scanning WBC Graph Data	99MRC	16725-2-1 ^ Scanning WBC Graph Data -1 ^99MRC
Picture Name of Mindray Reading Red Blood Cells and Platelets	ST	16726-1	Scanning RBC And PLT Graph Name	99MRC	16726-1 ^Scanning RBC And PLT Graph Name^99MRC
Picture data of	ED	16726-2	Scanning RBC	99MRC	16726-2 ^Scanning RBC

red blood cells and platelets read by Mindray			And PLT Graph Data		And PLT Graph Data^99MRC
Mindray reads all image data in PDF format.	ED	16776	Scanning All Graph Data In PDF	99MRC	16776^Scanning All Graph Data In PDF^99MRC
Uneven RBC size grading result	NM	16727-1	Anis	99MRC	16727-1 ^Anis^99MRC
Macrocytic grading result	NM	16728-1	Macr	99MRC	16728-1 ^Macr^99MRC
Microcytosis grading result	NM	16729-1	Micr	99MRC	16729-1 ^Micr^99MRC
Hypochromic Red Blood Cell Grading Result	NM	16730-1	HypoCh	99MRC	16730-1 ^HypoCh^99MRC
Polychromatic red cell grading result	NM	16731-1	PolyCH	99MRC	16731-1 ^PolyCH^99MRC
RBC malformation grading result	NM	16732-1	Poik	99MRC	16732-1 ^Poik^99MRC
Segmented Red Blood Cell Grading Result	NM	16733-1	Schi	99MRC	16733-1 ^Schi^99MRC
Sawtooth RBC grading result	NM	16734-1	Echi	99MRC	16734-1 ^Echi^99MRC
Oval RBC grading result	NM	16735-1	Elli	99MRC	16735-1 ^Elli^99MRC
Oval RBC grading result	NM	16736-1	Oval	99MRC	16736-1 ^Oval^99MRC
Oral RBC Grading Result	NM	16737-1	Stom	99MRC	16737-1 ^Stom^99MRC
Target RBC grading result	NM	16738-1	Targ	99MRC	16738-1 ^Targ^99MRC
Teardrop-shaped Red Blood Cell Grading Result	NM	16739-1	Tear	99MRC	16739-1 ^Tear^99MRC
Basophilic stippling grading result	NM	16740-1	Baso	99MRC	16740-1 ^Baso^99MRC
Acanthocyte	NM	16741-1	Acan	99MRC	16741-1 ^Acan^99MRC

grading result					
Bite mark RBC grading result	NM	16742-1	Bite	99MRC	16742-1 ^Bite^99MRC
Vesicular Red Blood Cell Grading Result	NM	16743-1	Blis	99MRC	16743-1 ^Blis^99MRC
Irregular Systolic Red Blood Cell Grading Result	NM	16744-1	Irre	99MRC	16744-1 ^Irre^99MRC
Sickle Cell Grading Result	NM	16745-1	Sick	99MRC	16745-1 ^Sick^99MRC
Spherical Red Blood Cell Grading Result	NM	16746-1	Sphe	99MRC	16746-1 ^Sphe^99MRC
RBC agglutination grading result	NM	16747-1	Aggl	99MRC	16747-1 ^Aggl^99MRC
RBC roulette sorting and grading result	NM	16748-1	Roul	99MRC	16748-1 ^Roul^99MRC
Haojiao Body Grading Result	NM	16749-1	Howe	99MRC	16749-1 ^Howe^99MRC
Pappenheim body classification result	NM	16750-1	Papp	99MRC	16750-1 ^Papp^99MRC
Parasite classification result	NM	16751-1	Para	99MRC	16751-1 ^Para^99MRC
Neutrophil granulocyte percentage	NM	16761-1	BfNeu%	99MRC	16761-1 ^BfNeu%^99MRC
Quantity of neutrophil granulocyte	NM	16761-2	BfNeu#	99MRC	16761-2 ^BfNeu#^99MRC
Percentage of macrophages (including monocytes)	NM	16762-1	BfMac%	99MRC	16762-1 ^BfMac%^99MRC
Number of macrophages (including monocytes)	NM	16762-2	BfMac#	99MRC	16762-2 ^BfMac#^99MRC
Degree	NM	17129	Dohle	99MRC	17129^Dohle^99MRC

Degree	NM	17130	Vacuo	99MRC	17130^Vacuo^99MRC
Degree	NM	17131	HyperGran	99MRC	17131^HyperGran^99MRC
Degree	NM	17132	HypoGran	99MRC	17132^HypoGran^99MRC
Degree	NM	17133	HyperSeg	99MRC	17133^HyperSeg^99MRC
Degree	NM	17134	HypoSeg	99MRC	17134^HypoSeg^99MRC
Platelet level	NM	17135	PLVL	99MRC	17135^PLVL^99MRC
Platelet aggregation	NM	17136	PCLMP	99MRC	17136^PCLMP^99MRC

Table 15 Communication Parameter Units

Parameter units displayed on the screen	**Communication parameter unit (OBX -6)**
10^12/L	10*12/L
10^9/L	10*9/L
10^4/L	10*4/L
10^3/L	10*3/L
10^6/uL	10*6/uL
10^4/uL	10*4/uL
10^3/uL	10*3/uL
10^2/uL	10*2/uL
mL/L	mL/L
/nL	/nL
/pL	/pL
g/L	g/L
g/dL	g/dL
L/L	L/L
mmol/L	mmol/L
%	%
fL	fL
um^3	um\S\3
pg	pg
fmol	fmol
amol	amol
Year (age unit)	yr
Month (age unit)	mo
Day (age unit)	d
Hour (age unit)	hr

Week (age unit)	wk
%(NGSP)	%(NGSP)
mmol/mol	mmol/mol
%(Mono-S)	%(Mono-S)
mg/dL	mg/dL
S unit: Second	s
mm/h	mm/h

2. Some OBX messages use custom enumeration values. See for the meaning of the values.Table 16 HL7 Enumeration Definition

Table 16 HL7 Enumeration Definition

Data Item	**Enumerated Value**
Loading mode (Take Mode)	Value enumeration: "O" - open-vial "A" - Auto "C" – closed
Blood mode (Blood Mode)	Value enumeration: "W" - whole blood "P" -predilute "B" – body fluid "Q" – QC
Measurement mode (Test Mode)	Value enumeration: Single mode and any mode combination "CBC" “DIFF” “RET” “NRBC” “CBC+DIFF+RET+NRBC” “CRP” “CBC+DIFF+RET+NRBC+CRP” “SMST” “CBC+DIFF+RET+NRBC+CRP+SMST” “CR/PLT-8X” “CDR/PLT-8X”

	“A1C” “STANDARD” “EXTEND” "Digital WBCs" such as "100WBC" and "200WBC" (supporting any integer between 50 s) “RBC” “PLT” “PLTPRO” “SMST+100WBC+RBC+PLT+PLTPRO” The following analysis modes are supported for the two-way LIS response and result reporting of NovoZan: "PCT," "IL -6," "PCT/IL -6," "MP IgM," "MP IgG," "Flu A/B," "CP IgM," "CP IgG," "ADV," "RSV," "PIV," "Flu A," "Flu B." Among them, "Flu A" and "Flu B" are only used in the test mode field of result communication, not in the bidirectional LIS mode field. Bidirectional LIS starts sample analysis, and the corresponding instrument analysis mode is "Flu A/B."
QC Level (Qc Level)	Take the following enumerated values: "L" - low "M" - Medium "H" - High "N" - normal "P" - Pathology “CRL-1” - CRL-1 “CRL-2” - CRL-2
Histogram discriminator adjusted flag and flags	OBX -2 The data type is "IS." Take the following enumerated values: "T" - True

	"F" - false
QC date/time edited flag	"E": Modified; otherwise, it will not be transmitted.
Test Item (Project Type)	"BL": Blood "BF": Body fluid
Gender	"M"/"m": Male "F"/"f": Female "U"/"u": Unknown Other content: It is directly processed as a displayed string.

3. Histogram data: According to the software settings, histogram data transfer has the following situations:

(1) Histogram data is not transmitted.

(2) Histogram data in bitmap format is transmitted. The value of the data type field in the OBX segment is "ED," and the value of the data field is in the form of" ^Image^BMP^Base64^…… ."Bitmap histogram data ……, where "Image" represents the transmitted image data, "BM" represents the transmitted BM data, and "Base64" represents the coding mode of the bitmap data.

(3) Histogram data in binary system is transmitted. The value of the data type field in the OBX segment is "ED," and the value of the data field is in the form of" ^Application^Octet-stream^Base64^…… ."Histogram data …… ," in which" Application^Octer-stream "is the HL7 standard data subtype, indicating the binary data type defined by the application, and" Base64 "indicates the data encoding mode.

Note: In a communication message, whether it is histogram data in the form of bitmap or binary histogram data is determined according to the ID field in the OBX segment.

4. scatter diagram data: The bitmap data is transmitted. The data type field in the OBX segment is "ed," and the data field is in the form of "^Image^BMP^Base64^……."Scatter diagram Bitmap data ……: "Image^BMP^Base64" indicates that the Base64-encoded Bitmap data is transmitted.

Transmits the scatter diagram particle type array that needs to be grayed out. The data type field value in the OBX segment is "ED," and the data field value shape is" ^Application^Octet-stream^Base64^…… ."The dimmed particle type array data is …… ." The length varies. For a particle type, it is an enumerated value. The cell types corresponding to the enumerated value are as follows:

MinType	0x0	MIN Type
BasoGhost	0x0	Blood shadow
Baso	0x01	Basophils
BasoWbc	0x02	WBC
DiffGhost	0x03	Blood shadow
DiffLym	0x04	Lymph

DiffMon	0x05	Mononuclear
DiffEos	0x06	Acidophilic
DiffNeu	0x07	Neutral particle
DiffAly	0x08	Abnormal lymph
DiffImm	0x09	Immature cell
RetRbc	0x0a	RBC
RetLfr	0x0b	Low fluorescent RET
RetMfr	0x0c	Medium fluorescent RET
RetHfr	0x0d	High fluorescent RET
RetWbc	0x0e	WBC
RetPlt	0x0f	Platelet
Nrbc	0x10	Nucleated Red
NrbcGhost	0x11	Blood shadow
NrbcWbc	0x12	WBC
Notype	0x13	Unclassified type
DiffHf	0x14	Body fluid high fluorescent cell
RetIpf	0x15	Immature Platelets
MaxType	0x16	Maximum type

5. Communication of age: The age in patient demographics is transmitted in an OBX segment which contains an integer and a unit. The age may be "<1" days, same as on the labXpert screen.

Table 17 Hema Cell Type Name Mapping Table Type For Viewing Machine	**Chinese name**	**English name**	**LIS Communication ID**
WBC	WBC	Leukocytes	M_WBC
	basophilic granulocyte	Basophils	M_WBC_BAS
	eosinophilic granulocyte	Eosinophils	M_WBC_EOS
	Promyelocyte	Promyelocytes	M_WBC_PROMYEL
	Neutrophils	Myelocytes	M_WBC_MYEL
	Neutrophilic metamyelocytes	Metamyelocytes	M_WBC_METAMYEL
	Neutral horseshoe-shaped nucleus	Band neutrophils	M_WBC_BANDNEU
	Neutrophilic segmented granulocyte	Segmented neutrophils	M_WBC_SEGNEU
	Lymphocyte	Lymphocytes	M_WBC_LYM
	Monocytes	Monocytes	M_WBC_MON

	plasma cells	Plasma cells	M_WBC_PLASM
	Reactive lymphocyte	Reactive lymphocytes	M_WBC_REACTLYM
	Large granular lymphocyte	Large granular lymphocytes	M_WBC_GRANLYM
	Prolymphocyte	Prolymphocytes	M_WBC_PROLYM
	Atypical lymphocytes	Atypical lymphocytes	M_WBC_ALYM
	Blast cell	Blasts	M_WBC_BLAST
	Sezary cell	Sezary cells	M_WBC_SEZ
	Hair cell	Hairy cells	M_WBC_HAIR
	Unknown cell	Unknown	M_WBC_UNK
Non-white blood cell	Interferents	Artefacts	M_ARTEFACTS
	Smear cells	Smudge cells	M_SMUDGECELLS
	Nucleated Red Blood Cell	Erythroblasts (NRBC)	M_NRBC
	Giant platelets	Giant platelets	M_GIANTPLT
	Platelet aggregation	Platelets aggregations	M_PLTAGGR
	Megakaryocyte	Megakaryocytes	M_MEGAKARYO

Table 18 SAA Instrument Channels

Content	Description
SAA1	SAA instrument channel 1
SAA2	SAA instrument channel 2

Table 19 Data Items Of The High And Low Reference Ranges Used In Review Results

Chinese name	English name	HL7 ID
Neutrophil segmented granulocyte percentage	Seg-Neur%	16701-1
Lymphocyte percentage	Lymr%	16709-1
Monocyte percentage	Monr%	16707-1
Eosinophilic granulocyte Percentage	Eosr%	16710-1
Basophilic granulocyte Percentage	Basr%	16712-1

Annex B Base64 Encoding Process

(1) Select the three adjacent bytes (i.e. 24 bit) from the data flow, divide them into four 6-bit groups in the sequence from left to right, and then obtain the corresponding ASCII string according to the mapping. See below: Table 20 Base64 Mapping Table

Raw data: 15H A3H 4BH

Binary data 00010101 10100011 01001011

6-bit groups of 000101 011010 001101 001011 obtained after division

Corresponding code value 5H 1AH0DH0BH

Corresponding characters F a N L

Table 20 Base64 Mapping Table

Value/Code	Value/Code	Value/Code	Value/Code
0 A	17 R	34 I	51 z
1 B	18 S	35 j	52 0
2 C	19 T	36 k	53 1
3 D	20 U	37 I	54 2
4 E	21 V	38 m	55 3
5 F	22 W	39 n	56 4
6 G	23 X	40 o	57 5
7 H	24 Y	41 p	58 6
8 I	25 Z	42 q	59 7
9 J	26 a	43 r	60 8
10 K	27 b	44 s	61 9
11 L	28 c	45 t	62 +
12 M	29 d	46 u	63 /
13 N	30 e	47 v	
14 O	31 f	48 w	(pad) =
15 P	32 g	49 x	
16 Q	33 h	50 y	

(2) Repeat step 1 continuously until the data stream is encoded.

If the data left is less than three bytes, zero is added to the right to supplement the data. If the 6-bit groups obtained through coding consist of filling bits, they are mapped to the "=" character. When the last two bytes are left, the obtained coding string contains two "=" characters. When the last two bytes are left, the obtained coding string contains one "=" character. Two examples are shown below:

① Raw Data 0AH

00001010

This interface fills the obtained data. 00001010 00000000 00000000

Divided 6-bit groups 000010 100000 000000 000000

Corresponding data value 02H 20H 00H 00H

Corresponding characters C g = =

② Raw Data 0AH 0BH

00001010 00001011

This interface fills the obtained data. 00001010 00001011 00000000

Divided 6-bit groups	000010	100000	101100	000000	
Corresponding data value		02H	20H	2CH	00H
Corresponding characters		C	g	s	=