



SUIT

Sysmex Universal Interface

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Version	Date	Author	Comments
1.0	10.05.2005	Thomas Ettrich	– Initial Version of the SUIT-Description based on the SIS 2.0-Description by Mieko Asada
2.0	05.01.2007	Susanne Jäkel	– Test-Codes and Flags added for the support of the UF-1000i
3.0	05.03.2007	Thomas Ettrich	– Font "Times New Roman" exchanged with "Arial" – Some text-passages pointed out – Added a more precise description how to handle an OBR-5 which is exceeding 200 Bytes. – Added a note for the ordering in a multi-discipline environment at chapter 3.3.1 – Replaced the "Yen"-Character by "¥" – Added the test-codes for the XE-5000 and CA-Series
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5.0	08.08.2008 09.09.2008	Kaulmann Olivier	– Re-structure the document – Added use case for better understanding – OBX-6 field length extended from 14 to 106 – OBX-4 field length extended from 15 to 60 – Added new parameters at the haematology section (5.3.1)
6.0	13.11.2009	Kaulmann Olivier	– Add new analyser XT4000i and AX4030 – Rename IP flag Leucocytosis into Leukocytosis – Add new Scattergram RET-E and Histogram RBC-Y – Update Appendix D: Interpretation-flags – Add following new parameters at chapter 5.3.1: TC-PMN%, TC-MN%, TC-EO%, TC-HF%
7.0	27.06.2011	Kaulmann Olivier	– Add new chapter: 5.4.1 Action & error messages and positive flagging information – Add 5.6 Appendix F: Case Manager – Update chapter 5.4 Appendix D: Interpretation-Flags (IP Flags) – Update chapter 5.3 with the test code available with XN analyser – Update chapter 5.3.2 with the urinalysis parameter name – Update chapter 5.4 with the Interpretation-Flags available with XN analyser
8.0	24.06.2014	Kaulmann Olivier	– Update chapter 5.1.2 Case that SUIT supplies "png" files – Update chapter 5.3.2 Haematology section: research parameter and service parameter – Update chapter 5.4 Appendix D: Interpretation-Flags (IP Flags): rename Blast/Abn_Lympho? Into Blasts/Abn_Lympho? – Update chapter 5.4.1 Action & Error Messages and positive flagging information
9.0	4.02.2015	Kaulmann Olivier	– Update chapter 3.2.2 Forwarding Status: the text in the table "Add text between [STX] and [ETX] in Binary" was changed into "Add text between [STX] and [CHK1] in Binary" – Add chapter 5.3.2.1: UF500i/1000i upgrade kits host codes – Add chapter 5.3.2.2: UX-2000 host codes – Update chapter 5.4.1 Action & Error Messages and positive flagging information. The Following messages were added:

Version	Date	Author	Comments
10.0	24-04-2015	Kaulmann Olivier	<ul style="list-style-type: none"> – Update chapter 5.1.3 Summary of which image file type is generated depending on analyser or solution type – Update chapter 5.3.1 Haematology section: add a footnote 6 for the diagnostic parameter NRBC# and NRBC% – Update chapter 5.3.1 Haematology section: add the XN-L Series research parameter NRBC# and NRBC% – Update chapter 5.3.2.2 host codes: small text changes – Update chapter 5.4 Appendix D: Interpretation-Flags (IP flags): add a column for XN-L Series – Update chapter 5.4.1 Action & Error and positive flagging information: add a column for XN-L Series
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12.0	22-08-2016	Amjad Azizi	<ul style="list-style-type: none"> – Update chapter 5.3.1 Haematology section: added parameters NEUT-GI, NEUT-RI, RE-LYMP#, RE-LYMP%, AS-LYMP#, AS-LYMP%, RBC-He, Delta-He, HYPO-HE, HYPER-HE, MicroR, MacroR; added new section PLT-F with parameter IPF#; renamed TC-BF to TC-BF#; added research parameters AS-LYMP%L, RE-LYMP%L – Update chapter 5.3.2 Urinalysis section: added parameters LA_RBC(*), S_RBC(*), NL_RBC#(*), NL-RBC%(*), LY_RBC(*) – Update chapter 5.4 Appendix D: Interpretation Flags (IP Flags): Renamed flagname Blasts/Abn Lympho? into Blasts/Abn_Lympho?, added new flags Giant_Platelet?, pRBC?, pRBC?(R), iRBC?, iRBC?(R), renamed flagnames: Debris high into Debris_High, Discrimination error (RBC/XTAL, RBC/BAC, BRBC/YLC) into Discr_Error_(RBC/XTAL, RBC/BAC, BRBC/YLC), Urine conductivity abnormal into Urine_Conductivity_abnormal, Carry-over? into Carry_Over?
13.0	20-05-2019	Burbulla Juergen	<ul style="list-style-type: none"> – The SUIT interface definition version 13 is aligned with the XN IPU version 22.08, the XN-L IPU version 00-19 and the SUIT application version 2.0 – General format changes – Chapter 1: "XN 1500" added to the list of haematology devices. "XN-3000" and "XN-9000" removed from the list. Coagulation device and WAM solutions removed from the list. – Chapter 3.3.2: "Reagent information Record" added – Chapter 4.1.1: "Reagent information Record" added. Record type "E" removed because it is not supported. Column "Section" removed because of no meaning. – Chapter 4.8: Field length of field "DT" changed to 14 characters – Chapter 4.9: New chapter added for the new "Reagent Information Record" description – Chapter 5.1 Appendix A: Graphical information: General adaptations. New images added: "WPC(FSC-SFL)(HPC only)", "WPC(FSCW-FSC)(HPC only)", "WPC(HPC only)", "WPC(SSC-FSC)(HPC only)" – Chapter 5.2.5 replaced by "Results with reagent information" examples. – Chapter 5.3.1: New SMEAR parameter (SMEAR, STAIN, ASP) from device "XN 1500" added. – Chapter 5.3.1: New SMEAR parameter (SMEAR, STAIN, ASP) from device "XN 1500" added. General footnote changes. Completion of missing parameter names. New group "WPC" added. Group assignment of "IPF#" changed. List of research and service parameters removed. Structural and name changes within the code table. – Chapter 5.3.3 "Coagulation" removed – Chapter 5.4: IP flag "pRBC?" and "pRBC?(R)" removed from the list of "Interpretation flags". These flags are replaced by the flags "iRBC?" and "iRBC?(R)". WBC_Abn_Scattergram assigned to XE-2100D. General footnote changes – Chapter 5.4.1: New action message "ACTION_MESSAGE_Retest_eosinophil" added. Action message "Sample mixing_Failure" removed, because it is no longer supported. "ACTION MESSAGE_Aged_Sample?" assigned to XN-L analyser series

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1. Introduction

This document describes the Communication Specifications of the Sysmex Universal Interface (SUIT). This protocol is based on the ASTM standards E1238-94 and E1381-91

(1) Presentation Level

ASTM E1238-94 Standard Specification for Transferring Clinical Observations Between Independent Computer Systems

(2) Physical Level and Data Link Level

ASTM E1381-91 Specification for Low-level Protocol to Transfer Message Between Clinical Laboratory Instruments and Computer Systems

Please refer the original ASTM documents for the details.



Note:

SUIT supports the order query mode as well as the order (batch) download mode. Which specific communication mode is used depends on the device type (analyser) or solution type (WAM) which is connected to the host.

Be prepared for both modes and wait for our confirmation which communication mode has to be used.

This document consists of 2 main chapters:

■ The **SUIT interface** and **Message** format chapters:

These chapters describe the communication protocol itself which is mainly the same for all device types or WAM solution connected to the hosts and

■ The **Appendix** chapters:

These chapters describe the differences between the different analyser types and solution types (WAM) connected to the host. The differences consist of the:

- graphic file management
- analyser specific test names and flags names

Some Log files are detailed in Appendix B meant to provide additional information for better understanding.

Supported analyser types

The table below shows the two analyser types and its devices which are communicating with the LIS using this SUI interface format.



Note:

The WAM solution *Extended* IPU normally communicates with the LIS using the *SUITplus* format. It is optionally also able to communicate using this SUI format. For the connectable analyser types to *Extended* IPU, please look into the “*Extended* IPU Scope of Supply”, chapter “Communication partners”.

Different analyser types and WAM solution types:

Haematology Devices	Urinalysis Devices
XN Series: – XN-1000 – XN-1500 – XN-2000	UF-500i UF-1000i UX-2000
XN-L Series: – XN-350 – XN-450 – XN-550	
XE Series: – XE-5000 – XE-2100 – XE-2100D	
XS Series: –XS-1000i –XS-800i	
XT Series: – XT-2000i – XT-1800i – XT-4000i	

2. Communication Specifications

The communication specifications are based on different levels

(1) Physical Connection Method:

RS-232C or Ethernet connection per HOST connection.

(2) No. of HOST connection lines:

SUIT supports up to 2 line connection to the LIS:

- case of 1 line configuration: Test Orders & Test Results on same line
- case of 2 lines configuration¹: Test Orders / Test Results on separate lines

(3) Communication Mode²:

Query mode or Batch download mode

(4) Communication Description:

Test Order HOST → SUIT

Order Inquiry HOST ← SUIT

Test Result HOST ← SUIT

(5) Test Order: 300 items / sample

(6) Test Result: 300 items / sample

¹ Some configurations are not able to work with a 2 line connection configuration. In case you require a 2 line connection, please ask for confirmation.

² SUIT supports the order query mode as well as the order (batch) download mode. Which specific communication mode is used depends on the device type (analyser) or solution type (WAM) which is connected to the host.

Be prepared for both modes and wait for our confirmation which communication mode has to be used.

3. SUIT Interface

3.1. Physical Level

With the exception of the following, this specification conforms to ASTM E1381-91 standard:

- RS-232C or Ethernet (RS-232D for ASTM)
- RS-232C Connector: D-SUB 25pin Male or D-SUB 9pin Male

D-SUB 25pin Male:

Pin Code	Name	Signal Direction
1	Shield	
2	Send Data	Output
3	Receive Data	Input
4	Request To Send	Output
5	Clear To Send	Input
6	Data Set Ready	Input
7	Ground	
20	Data Terminal Ready	Output

D-SUB 9pin Male:

Pin Code	Name	Signal Direction
1	Shield	
2	Receive Data	Input
3	Send Data	Output
4	Data Terminal Ready	Output
5	Ground	
6	Data Set Ready	Input
7	Request To Send	Output
8	Clear To Send	Input

S-232C Settings (Default values underlined)

- Start bit : 1 ("0" in Binary expression)
- Stop bit : 1 , 2 ("1" in Binary expression)
- Data Byte : 7 , 8
- Parity : N/A, Even Numbers, Odd Numbers
- Transmission Speed (bps) : 1200, 2400, 4800, 9600, 19200

3.2. Data Link Level

Data Link Level consists of the following 3 types of communication status:

■ Setting Status:

Establish a logical communication and determine the sending direction of information. This defines the Sending and Receiving sides.

■ Forwarding Status:

The Sending side transmits messages to the Receiving side.

■ End Status:

Open the communication line(s) and change to idle status for both the Sending and Receiving side.

3.2.1. Setting Status

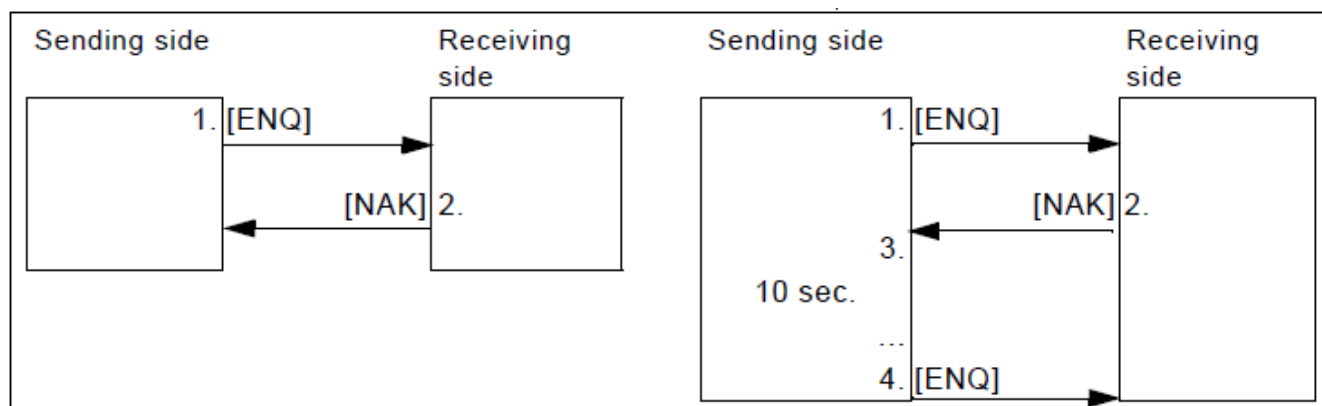
Establish a logical communication line to determine the sending direction of information.

1. The Sending side transmits [ENQ] to the Receiving side.

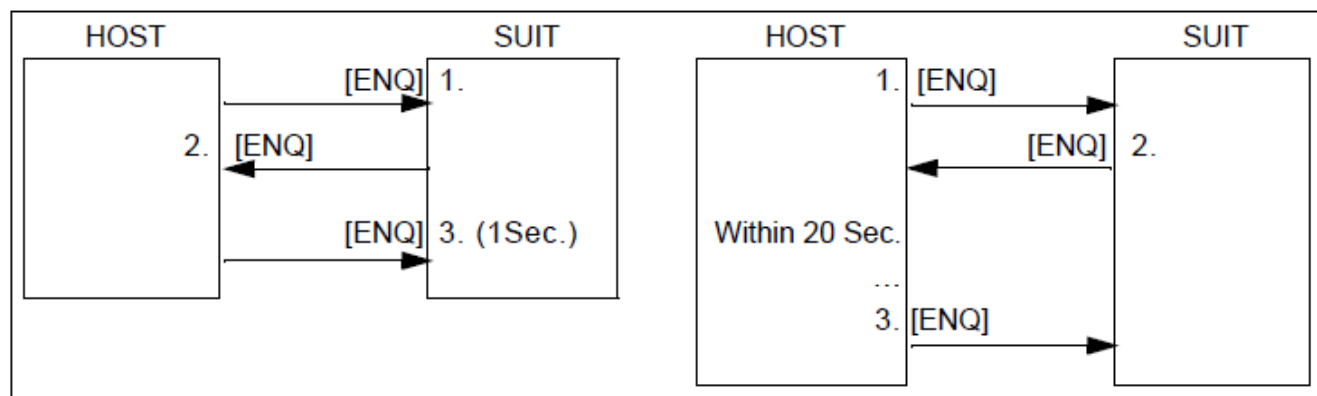
In its response, the Receiving side:

- Returns [ACK] if the transmission is available.
- Returns [NAK] if the transmission is unavailable.

The Sending side must wait 10 seconds before re-sending [ENQ].



2. When both sides send [ENQ] ([ENQ] clash), the Slave Computer side has priority over the Host Computer.
 - The Slave Computer re-sends [ENQ] 1 second later.
 - The Host Computer must wait 20 seconds before re-sending.



3.2.2. Forwarding Status

The Sending side transmits a message to the Receiving side.

The following is an example of the text frame structure:

[STX] [F#] [TEXT] [ETX] [CHK1] [CHK2] [CR] [LF]



Note:

When the text exceeds 240 characters, use a [ETB] to divide and create 2 or more frames

[STX] [F#] [TEXT] [ETB] [CHK1] [CHK2] [CR] [LF]

Symbol	Code	Description
[STX]	Indicates the beginning of the text Send.	Code to be sent at the beginning of a frame.
[F#]	Frame Number	Frame Number is "0" to "7" of ASCII numbers. Its purpose is to distinguish between sent frame and re-send frames. This 1-digit number is sent immediately after STX characters. The Frame Number begins with "1" when the Forwarding Status starts, and increases sequentially, every time a new frame is sent and a positive reply is received. The Frame Number returns to "0" after "7", and the above steps are repeated.
[TEXT]	Message Text (Refer to explanation of ASTM E1238-94)	Employ ASTM E1394-91 Record. Refer to the Message Format in the later section for details.
[EXT]	Indicates the end of the text Send.	The code to indicate the end of the final frame.

Symbol	Code	Description
[CHK1] [CHK2]	Express with "0" to "F" characters.	Add text between [STX] and [CHK1] in Binary. Then take the last 8 bits and express it in Hexadecimal (2 digits). Then, change the 2-digit number into "0" to "F" ASCII character format, and save each digit as CHK1 and CHK2.
[CR]	The ASCII Code for Recovery.	Code required before completing an E1394-91 Record (E1381-91 Message) or code that is sent between the 2nd and last within a frame.
[LF]	ASCII Code for line changes.	LF Code is used for the last character of a frame. LF cannot be used for Text messages.

**Note:**

■ **Timeout:**

1. In Setting Status, the Sending side sets a 15-second timer when sending [ENQ]. If there is no response within the 15 seconds, Timeout is applied. The Sending side turns to an End Status when Timeout occurs.
2. In Forwarding Status, the Sending side sets a 15 seconds timer after sending the last character of a frame.

If there is no response within the 15 seconds, Timeout is applied. The Sending side turns to End Status once the Timeout occurs.

The Receiving side sets the timer for 30 seconds when it first turns to the Receiving Status or responding to a frame.

If there is no response within 30 seconds, Timeout is applied. The Receiving side turns to the End Status when the Timeout occurs.

■ **Restricted message codes:**

Please find below 10 Transmission Restricted Message Codes. These (1 type of Format Restriction Code & 4 types of Instrument Restricted Codes) cannot be used for message Text:

Restricted Message Codes

Code Symbol	Meaning
SOH (01)	Beginning of Header
STX (02)	Beginning of Text Sending
ETX (03)	End of Text Sending
EOT (04)	End of Sending
ENQ (05)	Inquiry
ACK (06)	Positive Response

Code Symbol	Meaning
DLE (10)	Lost Data Link
NAK (15)	Negative Response
SYN (16)	Simultaneous Signal characters
ETB (17)	End of Sending Block
LF (0A)	Change lines
DC1 (11)	Instrument Restricted Character 1
DC2 (12)	Instrument Restricted Character 2
DC3 (13)	Instrument Restricted Character 3
DC4 (14)	Instrument Restricted Character 4

3.2.3. End Status

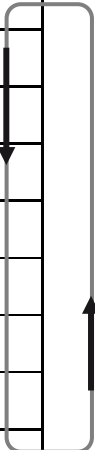
The Sending side sends [EOT] to indicate that all information has been transmitted to the Receiving side, and turns to the Idling Status.

Or the Receiving side sends [EOT] when the time out occurs, and turns to the Idling status. In order for the Sending Side to start transfer again, turns to the Setting Status.

3.3. Protocol

3.3.1. SUIT ← HOST (Test Order)

SUIT	Com. Direction	HOST
	←	ENQ
ACK	→	
	←	H: Header Record
ACK	→	
	←	P: Patient Record
ACK	→	
	←	C: Patient Comment Record
ACK	→	
	←	OBR: Order Record
ACK	→	
	←	C: Order Comment Record
ACK	→	
	←	L: End Mark Record
ACK	→	
	←	EOT



Repeat as many times as the No. of patients


Note:

- SUIT saves the Patient Comment Record in Patient Free Comment and Order Comment Record in Order Free Comment
- Discipline Separation:
- In the event of a laboratory receiving two specimens (e.g. 1x EDTA for Haematology and 1x Sodium Citrate for Coagulation) on a single patient, requiring tests for both haematology and coagulation on a single sample number, the downloaded order information from LIS, must be separated into the various disciplines.
- It is possible for the orders to be sent in the same data string, but the different discipline tests need to have separate patient and order records.
- Refer a log file example at chapter 5.2.3 Order for multiple discipline.

3.3.3. SUIT → HOST (Test Results)

Repeat as many times as the No. of samples

SUIT	Com. Direction	HOST
ENQ	→	
	←	ACK
H: Header Record	→	
	←	ACK
P: Patient Record	→	
	←	ACK
C: Patient Comment Record	→	
	←	ACK
OBR: Order Record	→	
	←	ACK
C: Order Comment Record	→	
	←	ACK
OBX: Test Result Record	→	
	←	ACK
C: Result Comment Record	→	
	←	ACK
Z: Reagent Information Record	→	
	←	ACK
L: End Mark Record	→	
	←	ACK
EOT	→	



Note:

SUIT sets:

- the Patient Comment Record in the Patient Free Comment
- Order Comment Record in the Order Free Comment
- Sample Free Comment, IP Message (incl. Rule Message) and Graphic Data information (File Name) in the Result Comment Record

3.3.5. SUIT → HOST (Order Inquiry)

SUIT	Com. Direction	HOST
ENQ	→	
	←	ACK
H: Header Record	→	
	←	ACK
Q: Inquiry Record	→	
	←	ACK
L: End Mark Record	→	
	←	ACK
EOT	→	

3.3.6. SUIT ← HOST (Order Command)

Same as 3.3.1

3.3.7. SUIT → HOST (QC Data)

SUIT	Com. Direction	HOST
ENQ	→	
	←	ACK
H: Header Record	→	
	←	ACK
S: QC Record	→	
	←	ACK
L: End Mark Record	→	
	←	ACK
EOT	→	



Note:

No output available for IP Messages, Graphic Data or for QC Data.

4. Message Format

4.1. Message and Record

SUIT employs ASTM E1238-94 Record for Text (messages) to be forwarded with an ASTM E1381-91 frame.

4.1.1. Record

The Record is a type of Text beginning with ASCII (alphabet code) called Record Descriptor, and ending with [CR]

Segment	Record Descriptor	Description
Message Header	H	Information Exchange Management Information
Patient Segment	P	Patient Information
Observation Order Segment	OBR	Test Order Information
Result Observation Segment	OBX	Test Result Information
Comment Segment	C	Comment Information
Request Results Segment	Q	Order Inquiry
Message Terminator	L	Message End
Scientific Segment	S	Scientific Information (Used for QC Data Output)
Reagent Information	Z	Used Reagent Information

4.1.2. Fields

The Record can be separated into several fields by separators. The fields are distinguished by their position in the record. Field lengths are not fixed. The following are types of separators:

Separator Type	Record Descriptor	Description
Field		Distinguish between fields within records. When there is no contents in a field, send the separator only.
Repeat	~	Use to distinguish a repeated/multiple same type of information within a field.
Component	^	Divide a field into several sub-fields.
Sub-component	&	Defined only in Header. Not used as separator.
Escape	\	Defined only in Header. Not used as separator.

4.2. Header Record

Header Records include definitions of separators, Version Information, and the Message Created Date etc.

(Record Format)

H		^	~		&												VER		DT	<	CR	>
(1)	(2)					(3)											(4)	(5)				

 Note:

Mandatory Fields described in Bold Text

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
(1)	H	H-1	Segment type ID	"H" fixed	1	Y	Y
(2)	^ ~ \ &	H-2	Delimiter definition	Definition of Separators : Field Separator (7Ch) ^ : Component Separator (5Eh) ~: Repeat Symbol (7Eh) \: Escape Symbol (5Ch) &:Sub-component Separator (26h) - "\ " and "&" Not used.	5	Y	Y
(3)		H-3 - H-12		Not in use		-	-
(4)	VER	H-13	Version	Regulated Version Number "A.2" Fixed (ASTM E1238-94)	3	Y	Y
(5)	DT	H-14	Date and time of message	Message Created Date/Time Format:YYYYMMDDHHMM	12	Y	Y

Mandatory Fields: H-1, H-2, H-13, H-14

4.3. Patient Record

Patient Record includes Patient Attribute Information.

(Record Format)

P	SEQ	PID		APID	NAME	MN	B/D	SEX				DCODE		HT	WT				ADMS	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)					
LC																				
(17)	(18)	(19)																		



Note:

Mandatory Fields described in Bold Text

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUI	HOST from SUI
(1)	P	P-1	Segment type ID	"P" Fixed.	1	Y	Y
(2)	SEQ	P-2	Transmission sequence number	Sequence Number. Sequential from "1" and increase by one per patient.	4	Y	Y
(3)	PID	P-3	Practice assigned patient ID	Patient ID.	16	Y	Y
(4)		P-4		Not in use		-	-
(5)	APID	P-5	Alternative patient ID	Alternative ID. Use as Public Insurance ID.	16	Y	Y
(6)	NAME	P-6	Patient name	Patient Name FN^LN FN : First Name LN : Last Name	41 (20^20)	Y	Y
(7)	MN	P-7	Mother's Maiden name	Mother's Maiden Name	20	Y	Y
(8)	B/D	P-8	Birth Date	Date of Birth Format: YYYYMMDD	8	Y	Y
(9)	SEX	P-9	Patient sex	Gender M: Male, F: Female, U: Unknown	1	Y	Y
(10)		P-10 - P-13		Not in use		-	-
(11)	DCODE	P-14	Attending physician ID	Primary Doctor Code/Doctor Name	27 (6^20)	Y	Y

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
(12)		P-15 - P-16		Not in use		-	-
(13)	HT	P-17	Patient height	Height: cm (w/ decimals) or feet^inch	6	Y	Y
(14)	WT	P-18	Patient weight	Weight: kg (w/ decimals) or pound^ounce	6	Y	Y
(15)		P-19- P-24		Not in use		-	-
(16)	ADMS	P-25	Admission status	In/Out Patient Differentiation OP: Out Patient, IP: In Patient	2	Y	Y
(17)	LC	P-26	Location	Location: Clinic Code^Ward Code	13 (6^6)	Y	Y
(18)		P-27- P-32		Not in use		-	-
(19)	DTR	P-33	Date/time registered	Data Registration Date (Patient Data/Latest Update Date) Format:YYYYMMDD	8	Y	Y

Mandatory Fields: P-1, P-2

4.4. Order Record

Order Record includes Test Order Information. Multiple order items are included in a record by using component Separators. Pay attention to 3.3.1, "Discipline Separation".

(Record Format)

OBR	SEQ	ONO	SNO	TESTID	PRI	RQDT	CLDT		CVLM		ACCD	DGCD
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
RCINF	RCDT	SRC		DTR		PSID		S<CR>				
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)				



Note:

Mandatory Fields described in Bold Text

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
(1)	OBR	OBR-1	Segment type ID	"OBR" Fixed.	3	Y	Y
(2)	SEQ	OBR-2	Sequence number	Sequence Number Sequential per OBR record in the Patient segment	4	Y	Y
(3)	ONO	OBR-3¹	Requester specimen ID or accession number	Sample No. (Barcode No.)* (HOST side)	29	Y	N
(4)	SNO	OBR-4	Producer specimen ID or accession number	Sample No. (Barcode No.)* (SUIT side)	29	N	Y
(5)	TESTID	OBR-5	Observation battery ID	Test Item Code^Name When ordering multiple orders, use the Repeat character, "~", to proceed as below: Code1^Name1~Code2^Name2~Code3^Name3 ~ ... If OBR-5 is too long, the part that exceeded 200 characters cannot be registered. When it is over 200, it has to send the order twice for one sample. E.g. if the length becomes 300	200	Y	Y

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
				bytes, separate it ex. 200+100 or 150+150 and so on. E.g. H, P, OBR, P, OBR, L E.g. H, P, OBR(ETB), OBR(ETX), L			
(6)	PRI	OBR-6	Priority	Processing Priority Level: S: STAT / Urgent	1	Y	Y
(7)		OBR-7	Requested date-time	Not in use		-	-
(8)	CLDT	OBR-8	Specimen collection or observation date-time	Sample Collection Date/Time Format: YYYYMMDDHHMM	12	Y	Y
(9)		OBR-9	observation end-time	Not in use		-	-
(10)	CVLM	OBR-10	Collection volume	Collection Volume (Urine etc.): Unit ml	5	Y	Y
(11)		OBR-11	CollectorID	Not in use		-	-
(12)	ACCD	OBR-12	Action code	Order Process Code <For New Samples> Register with the following: "A": Add the ordered "L": Lab. To obtain a sample <For Registered Samples> "A": Clear registered order(s), register the order as new. "L": Add orders	1	Y	N
(13)		OBR-13	Danger code	Not in use.			
(14)	RCINF	OBR-14	Relevant clinical information	Patient Comment^Sample Comment The code for Patient Comment 1~2~3~4~5^the code for Sample Comment1~2	48	Y	Y
(15)	RCDT	OBR-15	Date and time of specimen receipt	Registration Date/Time Format: YYYYMMDDHHMM	12	Y	Y
(16)	SRC	OBR-16	Source of specimen	Tube Type Code^Collection Source Code	98	Y	Y

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUI	HOST from SUI
				Tube Type 1^Collection Source~ Tube Type 2^Collection Source~ Tube Type 9^Collection Source (Note) SUI saves the Collection source of Tube Type 1 only.			
(17)		OBR-17 - OBR-22		Not in use		-	-
(18)	DTR	OBR-23	Date and time observation reported or status changed	Report (Update) Date/Time Format: YYYYMMDDHHMM	12	N	Y
(19)		OBR-24	Producer's Change	Not in use		-	-
(20)	PSID	OBR-25	Producer's section ID	Testing Section ID	3	N	Y
(21)		OBR-26 - OBR-27		Not in use		-	-
(22)	QT	OBR-28	Quantity- Timing	Order Comment Code	6	Y	Y

Mandatory Fields: OBR-1, OBR-2, OBR-3, OBR-5, OBR-12, OBR-15.

¹ Refer to chapter 5.5 Appendix E: Optional specification of OBR-3 management

4.5. Test Result Record

Test Result Record includes information on the received results.

(Record Format)

OBR		SEQ		VTTYPE		OBID			OBVAL		UNT			AFLG				ORST		DT					RSPS	<	CR	>
(1)		(2)		(3)		(4)		(5)	(6)		(7)		(8)	(9)	(10)	(11)	(12)	(13)	(14)									

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUI	HOST from SUI
(1)	OBX	OBX-1	Segment type ID	"OBX" Fixed	3	N	Y
(2)	SEQ	OBX-2	Sequence number	Sequence Number. Sequential per OBX Record in the Order Segment.	4	N	Y
(3)	VTTYPE	OBX-3	Value type	Test Result Data format ST: Characters NM: Numeric Value CE: Code	2	N	Y
(4)	OBID	OBX-4	Observation identifier	SUIT Software: Code WAM: Code^Name	30 61 (30^30)	N	Y
(5)		OBX-5		Not in use		-	-
(6)	OBVAL	OBX-6	Observation value	Test Result^Result Comment Code^Dilution ratio The Dilution ratio is optional and not supported by any configuration E.g these examples are equivalent: 10 10^tel 10^tel^ 10^tel^1 10^^1 Be prepared for all varieties (When the test results are Test Comment, set the Test Comment Code)	106 (100^3^1)	N	Y
(7)	UNT	OBX-7	Units	Unit (optional)	10	N	Y
(8)		OBX-8		Not in use		-	-

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUI	HOST from SUI
(9)	AFLG	OBX-9	Abnormal flags	Abnormal Value Flag: Upper/Lower Flag ~ Delta check Flag L : Low H : High LL : Panic low HH : Panic high > : Out of linearity W : Low reliability A : Abnormal (Except numeric value data)	5 (2~2)	N	Y
(10)		OBX-10 - OBX-11		Not in use		-	-
(11)	ORST	OBX-12	Observation result status	Test Result Status ^ Latest Operation Test Result Status: P: Preliminary Report F: Final Result I: Pending C: Revision Report Latest Operation: Edit : input or edit Validate : manual validate Count : count at pad menu Manual Send : send manually (N/A) : others	22 (1^20)	N	Y
(12)	DT	OBX-13	Date/Time of last change in normal value or units	Sending Date/Time Format: YYYYMMDDHHMM	12	N	Y
(13)		OBX-14 - OBX-16		Not in use		-	-
(14)	RSPS	OBX-17	Responsible Observer	Latest Operator ID	6	N	Y

¹ "W" is set:

- when WBC, LYMPH# and LYMPH% are compensated by NRBC,
- NEUT# and NEUT% are compensated by IG or NRBC or

WBC is reported by using WBC-D and PLT is reported by using PLT-O.

4.6. Comment Record

Comment Record includes the comments for the previous P, OBR, or OBX Record.

In case of following a P-Record, valid for SUIT Patient Free Comments.

In case of following an OBR-Record, valid for SUIT Order Free Comments.

In the case of following an OBX Record, valid for Sample Free Comments, IP Message, Graphic Data Information (File Name).

(Record Format)

C SEQ CMT <CR>
(1) (2) (3) (4)

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
(1)	C	C-1	Segment type ID	"C" Fixed	1	Y	Y
(2)	SEQ	C-2	Sequence number	Sequence Number. Sequential per C Record.	2	Y	Y
(3)		C-3		Not in use		-	-
(4)	CMT	C-4	Comment text	Comment Contents	100	Y	Y

To supply the LIMS with the graphical data of the analysers, SUIT is transmitting the filename to host by using a C-Record.

For more details refer to chapter 5.1 Appendix A

4.7. Order Inquiry Record

In ASTM1238-94, this is used for Previous Order Information and Result Information Inquiry; however for SUI this is used for the Query (Order Inquiry)

(Record Format)

Q		SEQ			PROPID				DT	<CR>
(1)	(2)	(3)	(4)	(5)	(6)					

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUI	HOST from SUI
(1)	Q	Q-1	Segment type ID	"Q" Fixed	1	N	Y
(2)	SEQ	Q-2	Sequence number	Sequence Number: 1 - 9999	4	N	Y
(3)		Q-3	Requestor Assigned patient ID	Not in use		-	-
(4)	PROPID	Q-4	Producer assigned patient ID	Sample No.~ Sample No.~.....	200	N	Y
(5)		Q-5 - Q-6		Not in use		-	-
(6)	DT	Q-7	Nature of request time limits	Registration Date/Time Format: YYYYMMDDHHMM (SUI sets the Registration Date)	12	N	Y

4.8. Scientific Information Record

(Record Format)

S	SEQ	METH	INST	QC	SID	ANA	RESULT	DT<CR>			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
(1)	S	S-1	Segment type ID	"S" Fixed	1	N	Y
(2)	SEQ	S-2	Sequence number	Sequence Number: 1 – 9999	4	N	Y
(3)	METH	S-3	Analytical Method	Mode: "Manual" or "Closed"	10	N	Y
(4)	INST	S-4	Instrumentation	Analyser Name or Instrument ID	10	N	Y
(5)		S-5 - S-6		Not in use		-	-
(6)	QC	S-7	Quality Control	"QC" Fixed	2	N	Y
(7)		S-8 - S-10		Not in use		-	-
(8)	SID	S-11	Specimen ID	Lot Number of Control Reagent	10	N	Y
(9)	ANA	S-12	Analytic	Analysis Item Name	8	N	Y
(10)	RESULT	S-13	Result	QC Data	8	N	Y
(11)		S-14 - S-15		Not in use		-	-
(12)	DT	S-16	Analysis Date and time	Measurement Date/Time YYYYMMDDHHMMSS	14	N	Y

4.9. Reagent Information Record

(Record Format)

Z	SEQ	NAME	LOT	EXP-1	EXP-2	REG	RU	RACK	POS	SAMPLE	ATT	DT <CR>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)



Note:

Mandatory Fields described in Bold Text

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
(1)	Z	Z-1	Record type	"Z" Fixed	1	N	Y
(2)	SEQ	Z-2	Sequence number	1 - 9999	4	N	Y
(3)	NAME	Z-3	Reagent	Reagent name	32	N	Y
(4)	LOT	Z-4	Lot	Lot number	8	N	Y
(5)	EXP-1	Z-5	Expiration date	YYYYMMDDHHMMSS	14	N	Y
(6)	EXP-2	Z-6	Expire after open	Fixed number of days	3	N	Y
(7)	REG	Z-7	Registration date	YYYYMMDDHHMMSS	14	N	Y
(8)	RU	Z-8	Not used		11	N	Y
(9)	RACK	Z-9	Rack number		6	N	Y
(10)	POS	Z-10	Rack position		2	N	Y
(11)	SAMPLE	Z-11	Sample ID		22	N	Y
(12)	ATT	Z-12	Sample attribute	M: manual A: assigned by analyser B: barcode reader C: assign by host	1	N	Y
(13)	DT	Z-13	Result time stamp	YYMMDDHHMMSS	14	N	Y

Mandatory Fields: Z-1, Z-2, Z-3, Z-4, Z-5, Z-6, Z-7, Z-9, Z-10, Z-11, Z-12, Z-13

4.10. End Mark Record

(Record Format)

L	SEQ		PCNT	LCNT	<CR>
(1)	(2)	(3)	(4)	(5)	



Note:

Mandatory Fields described in Bold Text

	Field	Field Code	Field Name	Description	Field Length (bytes)	HOST to SUIT	HOST from SUIT
(1)	L	L-1	Segment type ID	"L" Fixed	1	Y	Y
(2)	SEQ	L-2	Sequence number	Sequence Number: 1	1	Y	Y
(3)		L-3		Not in use		-	-
(4)	PCNT	L-4	Patient count	Total number of P Records in message.	4	Y	Y
(5)	LCNT	L-5	Line count	Total number of records, (end with <CR>), in message.	10	Y	Y

Mandatory Fields: L-1, L-2, L-4, L-5

5. Appendixes

5.1. Appendix A: Graphical information

SUIT provides the file names and folder names of the graphical files as part of a “C” record.

The character string “&r&” in the name is representing a “\” character.

To identify a comment string as a file name, it is necessary to check the first 3 characters of the comment string. A file name always starts with the 3 characters “PNG”.

Example of a “C” record:

```
1C|3||PNG&R&20050627&R&2005_06_27_14_54_8205026_WBC_BASO.PNG[#13][#3]5A[#13][#10]
```

Please look at message examples in chapter 5.2.4.



Note:

Files names and graphical information are only provided by haematology devices, listed in chapter 1.

Scatter Type		Scatter Data Type		Section	Prefix
1	Histogram	01	RBC-Y	Haematology	PNG
	Histogram	02	RBC	Haematology	PNG
	Histogram	03	PLT	Haematology	PNG
	Histogram	04	WDF(FSC)	Haematology	PNG
	Histogram	05	RBC(FSC)	Haematology	PNG
	Histogram	06	RBC(NORMAL)	Haematology	PNG
	Histogram	07	PLT(NORMAL)	Haematology	PNG
	Scatter	08	WBC_BASO	Haematology	PNG
	Scatter	09	PLT_O	Haematology	PNG
	Scatter	10	DIFF	Haematology	PNG
	Scatter	11	IMI	Haematology	PNG
	Scatter	12	NRBC	Haematology	PNG
	Scatter	13	RET	Haematology	PNG
	Scatter	14	RET_EXT	Haematology	PNG
	Scatter	15	WDF	Haematology	PNG

Scatter Type	Scatter Data Type		Section	Prefix
Scatter	16	WNR	Haematology	PNG
Scatter	17	WPC	Haematology	PNG
Scatter	18	PLT-F	Haematology	PNG
Scatter	19	WDF-E	Haematology	PNG
Scatter	20	WDF-CBC	Haematology	PNG
Scatter	21	WNR(SFL-SSC)	Haematology	PNG
Scatter	22	WNR(SSC-FSC)	Haematology	PNG
Scatter	23	WNR(FSCW-FSC)	Haematology	PNG
Scatter	24	WDF-CBC (FSCW-FSC)	Haematology	PNG
Scatter	25	WDF(SSC-FSC)	Haematology	PNG
Scatter	26	WDF(FSC-SFL)	Haematology	PNG
Scatter	27	WDF(FSCW-FSC)	Haematology	PNG
Scatter	28	RET(SFL-SSC)	Haematology	PNG
Scatter	29	RET(SSC-FSC)	Haematology	PNG
Scatter	30	RET(FSCW-FSC)	Haematology	PNG
Scatter	31	PLT-F(SFL-SSC)	Haematology	PNG
Scatter	32	PLT-F(SSC-FSC)	Haematology	PNG
Scatter	33	PLT-F(FSCW-FSC)	Haematology	PNG
Scatter	34	WPC(SSC-FSC)	Haematology	PNG
Scatter	35	WPC(FSC-SFL)	Haematology	PNG
Scatter	36	WPC(FSCW-FSC)	Haematology	PNG
Scatter	37	WPC(FSC-SFL) (HPC only)	Haematology	PNG
Scatter	38	WPC(FSCW-FSC) (HPC only)	Haematology	PNG
Scatter	39	WPC(HPC only)	Haematology	PNG
Scatter	40	WPC(SSC-FSC) (HPC only)	Haematology	PNG

S: [ENQ]
R: [ACK]
S: [STX]1H|^~\&| ||||| A.2|200508041245[CR][ETX]33[CR][LF]
R: [ACK]
S: [STX]2Q|1| |995316031064| | |200508041245[CR][ETX]7A[CR][LF]
R: [ACK]
S: [STX]3L|1| |0|2[CR][ETX]12[CR][LF]
R: [ACK]
S: [EOT]

R: [ENQ]
S: [ACK]
R: [STX]1H|^~\&| ||||| A.2|200508041240[CR][ETX]2E[CR][LF]
S: [ACK]
R: [STX]2P|1|516| | ^9953160310| |19401028|F| ||||| 20050804[CR] [ETX]B4[CR][LF]
S: [ACK]
R: [STX]3OBR|1|995316031064| |WBC~RBC~HGB~HCT~MCV~MCH~PLT| | |200508041240| | |A| | |200508041240| | |2001| | | | |R|
[CR][ETX]65[CR][LF]
S: [ACK]
R: [STX]4L|1| |1|4[CR][ETX]16[CR][LF]
S: [ACK]
R: [EOT]

```
S: [ENQ]
R: [ACK]
S: [STX]1H|^~\&| ||||| A.2|200508041211[CR][ETX]2C[CR][LF]
R: [ACK]
S: [STX]2Q|1| |1| | 200508041211[CR][ETX]35[CR][LF]
R: [ACK]
S: [STX]3L|1| | 0| 2[CR][ETX]12[CR][LF]
R: [ACK]
S: [EOT]

R: [ENQ]
S: [AC]
R: [STX]1H|^~\&| ||||| A.2|200508041206[CR][STX]30[CR][LF]
S: [ACK]
R: [STX]2P|1|||| ^| ||||| 20050804[CR][STX]34[CR][LF]
S: [ACK]
R: [STX]3OBR|1|1| || | 200508041206| || | A| | | 200508041206| ||||| R|[CR][ETX]63[CR][LF]
S: [ACK]
R: [STX]4L|1| | 1|4[CR][ETX]16[CR][LF]
S: [ACK]
R: [EOT]
```

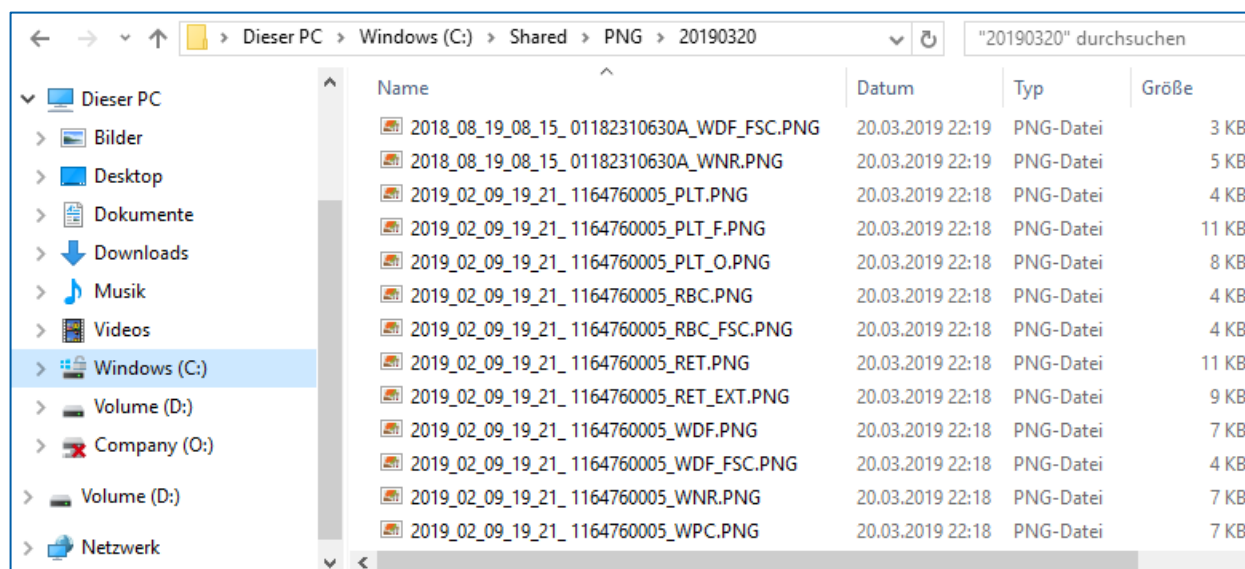
5.2.4. Result with graphical information in PNG-format

35/60

S: [STX]4OBX|7|NM|MCHC | |33.1^1|g/dL | | | | |F^|200508041154 | | |[[CR]][ETX]D4[CR][LF]
R: [ACK]
S: [STX]5OBX|8|NM|PLT | |274^1|10*3/uL | | | |F^|200508041154 | | |[[CR]][ETX]EB[CR][LF]
R: [ACK]
S: [STX]6OBX|9|NM|NEUT% | |53.3^1|% | | | |F^|200508041154 | | |[[CR]][ETX]01[CR][LF]
R: [ACK]
S: [STX]7OBX|10|NM|LYMPH% | |33.1^1|% | | | |F^|200508041154 | | |[[CR]][ETX]74[CR][LF]
R: [ACK]
S: [STX]0OBX|11|NM|MONO% | |9.1^1|% | | | |F^|200508041154 | | |[[CR]][ETX]F0[CR][LF]
R: [ACK]
S: [STX]1OBX|12|NM|EO% | |3.7^1|% | | | |F^|200508041154 | | |[[CR]][ETX]4D[CR][LF]
R: [ACK]
S: [STX]2OBX|13|NM|BASO% | |0.8^1|% | | | |F^|200508041154 | | |[[CR]][ETX]DE[CR][LF]
R: [ACK]
S: [STX]3OBX|14|NM|NEUT# | |2.75^1|10*3/uL | | | |F^|200508041154 | | |[[CR]][ETX]B4[CR][LF]
R: [ACK]
S: [STX]4OBX|15|NM|LYMPH# | |1.71^1|10*3/uL | | | |F^|200508041154 | | |[[CR]][ETX]FF[CR][LF]
R: [ACK]
S: [STX]5OBX|16|NM|MONO# | |0.47^1|10*3/uL | | | |F^|200508041154 | | |[[CR]][ETX]B2[CR][LF]
R: [ACK]
S: [STX]6OBX|17|NM|EO# | |0.19^1|10*3/uL | | | |F^|200508041154 | | |[[CR]][ETX]0E[CR][LF]
R: [ACK]
S: [STX]7OBX|18|NM|BASO# | |0.04^1|10*3/uL | | | |F^|200508041154 | | |[[CR]][ETX]9B[CR][LF]
R: [ACK]
S: [STX]0OBX|19|NM|RDW-SD | |42.9^1|fL | | | |F^|200508041154 | | |[[CR]][ETX]0D[CR][LF]
R: [ACK]
S: [STX]1OBX|20|NM|RDW-CV | |12.9^1|% | | | |F^|200508041154 | | |[[CR]][ETX]78[CR][LF]
R: [ACK]
S: [STX]2OBX|21|NM|PDW | |13.2^1|fL | | | |F^|200508041154 | | |[[CR]][ETX]39[CR][LF]
R: [ACK]
S: [STX]3OBX|22|NM|MPV | |10.7^1|fL | | | |F^|200508041154 | | |[[CR]][ETX]45[CR][LF]
R: [ACK]
S: [STX]4OBX|23|NM|P-LCR | |29.5^1|% | | | |F^|200508041154 | | |[[CR]][ETX]2D[CR][LF]
R: [ACK]
S: [STX]5OBX|24|NM|PCT | |0.29^1|% | | | |F^|200508041154 | | |[[CR]][ETX]B3[CR][LF]
R: [ACK]
S: [STX]6OBX|25|NM|H_RACK | |1 | | | |F^ | | | |[[CR]][ETX]8E[CR][LF]
R: [ACK]
S: [STX]7OBX|26|NM|H_TUBE | |1 | | | |F^ | | | |[[CR]][ETX]9F[CR][LF]
R: [ACK]
S: [STX]0OBX|27|NM|H_INID | |11035 | | | |F^ | | | |[[CR]][ETX]56[CR][LF]
R: [ACK]
S: [STX]1OBX|28|NM|H_INST | |XT-1800i | | | |F^ | | | |[[CR]][ETX]83[CR][LF]
R: [ACK]
S: [STX]2C|1 | |PNG&R&20050804&R&2005_08_04_11_54_840004804064_PLT.PNG[CR][ETX]DF[CR][LF]
R: [ACK]
S: [STX]3C|2 | |PNG&R&20050804&R&2005_08_04_11_54_840004804064_RBC.PNG[CR][ETX]C8[CR][LF]
R: [ACK]
S: [STX]4C|3 | |PNG&R&20050804&R&2005_08_04_11_54_840004804064_WBC_BASO.PNG[CR][ETX]53[CR]
[LF]
R: [ACK]
S: [STX]5C|4 | |PNG&R&20050804&R&2005_08_04_11_54_840004804064_DIFF.PNG[CR][ETX]0E[CR][LF]

R: [ACK]
S: [STX]6L|1 | 1|38[CR][ETX]4F[CR][LF]
R: [ACK]
S: [EOT]

Example of graphic-files in the explorer:



5.2.5. Results with reagent information

S: [ENQ]
R: [ACK]
S: [STX]1H|^~&| ||||| |A.2|200508041154[CR][ETX]32[CR][LF]
R: [ACK]
S: [STX]2P| ||^| |U| ||||| |^| |||[CR][ETX]54[CR][LF]
R: [ACK]
S: [STX]3C|1[CR][ETX]33[CR][LF]
R: [ACK]
S: [STX]4OBR|1| |840004804064| wbc| | |200508041154| ||| |200508041154| ||| |200508041154| |001| | |[CR][ETX]E1[CR][LF]
R: [ACK]
S: [STX]5C|1[CR][ETX]35[CR][LF]
R: [ACK]
S: [STX]6OBX|1|NM|WBC | |5.16^~1|10^3/uL | | |F^|200508041154 | | |[CR][ETX]FE[CR][LF]
R: [ACK]
S: [STX]7Z|1|Fluorocell WDF|A8029|20190501|90|20190108||2|1|3481425|B|20190123094430 [CR][ETX]2D[CR][LF]
R: [ACK]
S: [STX]8L|1 | |1|38[CR][ETX]4F[CR][LF]
R: [ACK]
S: [EOT]

5.2.6. Quality Control log files

There are two methods to send a quality control results from the analyser to the host.

Method 1:

One method is that the user is sending the quality control out of the IPU's sample explorer. In this case the sample will get the lot number of the actual QC as sample number.

E.g.: QC-51470801

For each parameter the analyser-ID and the measurement-mode is transmitted, too.

```
S: [ENQ]
R: [ACK]
S: [STX]1H|^~\&| || || || || |A.2|200506271532|[CR][ETX]35|[CR][LF]
R: [ACK]
S: [STX]2S|1|Manual|A2424| || QC| || QC-51470801|WBC|2.27| || 20050627153202|[CR][ETX]C8|[CR][LF]
R: [ACK]
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R: [ACK]
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R: [ACK]
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S: [STX]6S|5|Manual|A2424| || QC| || QC-51470801|MCV|76.5| || 20050627153202|[CR][ETX]E1|[CR][LF] || |
R: [ACK]
S: [STX]1S|16|Manual|A2424| || QC| || QC-51470801|MONO#|0.24| || 20050627153202|[CR][ETX]78|[CR][LF]
R: [ACK]
S: [STX]2S|17|Manual|A2424| || QC| || QC-51470801|EO#|0.17| || 20050627153202|[CR][ETX]D7|[CR][LF]
R: [ACK]
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R: [ACK]
S: [STX]4S|19|Manual|A2424| || QC| || QC-51470801|IG%|10.1| || 20050627153202|[CR][ETX]D3|[CR][LF]
R: [ACK]
S: [STX]5S|20|Manual|A2424| || QC| || QC-51470801|IG#|0.23| || 20050627153202|[CR][ETX]CD|[CR][LF]
R: [ACK]
S: [STX]6S|21|Manual|A2424| || QC| || QC-51470801|NRBC%|100.0| || 20050627153202 |[CR][ETX]92 [CR][LF]
R: [ACK]
S: [STX]7S|22|Manual|A2424| || QC| || QC-51470801|NRBC#|2.38| || 20050627153202 |[CR][ETX]6E [CR][LF]
R: [ACK]
S: [STX]0S|23|Manual|A2424| || QC| || QC-51470801|RDW-SD|42.7| || 20050627153202 |[CR][ETX]D1[CR] [LF]
R: [ACK]
S: [STX]1S|24|Manual|A2424| || QC| || QC-51470801|RDW-CV|15.3| || 20050627153202 |[CR][ETX]D1 [CR][LF]
R: [ACK]
S: [STX]2S|25|Manual|A2424| || QC| || QC-51470801|PDW|9.1| || 20050627153202|[CR][ETX]DC|[CR][LF]
R: [ACK]
S: [STX]3S|26|Manual|A2424| || QC| || QC-51470801|MPV|9.8| || 20050627153202|[CR][ETX]ED|[CR][LF]
R: [ACK]
S: [STX]4S|27|Manual|A2424| || QC| || QC-51470801|P-LCR|19.6| || 20050627153202|[CR][ETX]89|[CR][LF]
R: [ACK]
S: [STX]5S|28|Manual|A2424| || QC| || QC-51470801|PCT|0.05| || 20050627153202|[CR][ETX]09|[CR][LF]
R: [ACK]
S: [STX]6S|29|Manual|A2424| || QC| || QC-51470801|RET%|6.92| || 20050627153202|[CR][ETX]40|[CR][LF]
```

R: [ACK]
 S: [STX]7S[30|Manual|A2424| || QC| || | QC-51470801|RET#|0.1592| || 20050627153202|[CR][ETX]97[CR][LF]
 R: [ACK]
 S: [STX]0S[31|Manual|A2424| || QC| || | QC-51470801|IRF|36.6| || 20050627153202|[CR][ETX]02[CR][LF]
 R: [ACK]
 S: [STX]1S[32|Manual|A2424| || QC| || | QC-51470801|LFR|63.4| || 20050627153202|[CR][ETX]05[CR][LF]
 R: [ACK]
 S: [STX]2S[33|Manual|A2424| || QC| || | QC-51470801|MFR|29.7| || 20050627153202|[CR][ETX]0D[CR][LF]
 R: [ACK]
 S: [STX]3S[34|Manual|A2424| || QC| || | QC-51470801|HFR|6.9| || 20050627153202|[CR][ETX]D7[CR][LF]
 R: [ACK]
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 R: [ACK]
 S: [STX]5S[36|Manual|A2424| || QC| || | QC-51470801|IPF|22.2| || 20050627153202|[CR][ETX]01[CR][LF]
 R: [ACK]
 S: [STX]6S[37|Manual|A2424| || QC| || | QC-51470801|H_R[ACK]| || 20050627153202|[CR][ETX]28[CR][LF]
 R: [ACK]
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 R: [ACK]
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 R: [ACK]
 S: [STX]1S[40|Manual|A2424| || QC| || | QC-51470801|H_INST|XE-2100| || 20050627153202|[CR][ETX]C7[CR][LF]
 R: [ACK]
 S: [STX]2L[1| | 0|42[CR][ETX]45[CR][LF]
 R: [ACK]
 S: [EOT]

Method 2:

Another method consists that the user will send the quality by using the QC-Charts of the analyser. In this case the file number of the charts will be used as sample number.

E.g.: 11 for the file no. 11

S: [ENQ]
 R: [ACK]
 S: [STX]1H|^~\&| || || || || |A.2|200506271532|[CR][ETX]35[CR][LF]
 R: [ACK]
 S: [STX]2S[1|Manual|A2424| || QC| || | 11|WBC|2.27| || 20050627153207|[CR][ETX]54[CR][LF]
 R: [ACK]
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 R: [ACK]
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 R: [ACK]
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 R: [ACK]

S: [STX]1S|8|Manual|A2424| || QC| || | 11|PLT|54| || 20050627153207|[CR][ETX]0E[CR][LF]
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R: [ACK]
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R: [ACK]
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R: [ACK]
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R: [ACK]
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R: [ACK]
S: [STX]0S|31|Manual|A2424| || QC| || | 11|IRF|36.6| || 20050627153207|[CR][ETX]8E[CR][LF]
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R: [ACK]
S: [STX]2S|33|Manual|A2424| || QC| || | 11|MFR|29.7| || 20050627153207|[CR][ETX]99[CR][LF]
R: [ACK]

S: [STX]3S|34|Manual|A2424| || QC| || | 11|HFR|6.9| || 20050627153207|[CR][ETX]63[CR][LF]
R: [ACK]
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R: [ACK]
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S: [STX]0S|47|Manual|A2424| || QC| || | 11|PLT-O|66| || 20050627153207|[CR][ETX]BF[CR][LF]
R: [ACK]
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R: [ACK]
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R: [ACK]
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R: [ACK]
S: [STX]5S|52|Manual|A2424| || QC| || | 11|H_INST|XE-2100| || 20050627153207|[CR][ETX]5A[CR][LF]
R: [ACK]
S: [STX]6L|1| | 0|54[CR][ETX]4C[CR][LF]
R: [ACK]
S: [EOT]

5.3. Appendix C: host codes

5.3.1. Haematology section

Haematology	Code	Parameter name
CBC	WBC	Number of all leukocytes
	RBC	Number of all erythrocytes
	HGB	Haemoglobin concentration
	HCT	Haematocrit value: Erythrocytes ratio of total blood volume
	MCV	Mean corpuscular volume
	MCH	Mean corpuscular haemoglobin
	MVH	Mean corpuscular haemoglobin concentration
	PLT	Number of all platelets
	RDW-CV	Calculated distribution width of erythrocytes, coefficient of variation
	RDW-SD	Calculated distribution width of erythrocytes, standard deviation
	P-LCR	Platelet- Large Cell Ratio
	PCT	Plateletcrit
	PDW	Platelet distribution width
	MPV	Mean platelet volume
	MicroR	Ratio of microcytic red blood cell population
	MacroR	Ratio of macrocytic red blood cell population
	PLT-INFO ¹	Info which indicated if the PLT value was corrected by RET channel
	WBC-INFO ¹	Info which indicated if WBC value was corrected by NRBC count
DIFF	NEUT#	Neutrophil Count
	NEUT%	Neutrophil Percent
	LYMPH#	Lymphocyte Count
	LYMPH%	Lymphocyte Percent
	MONO#	Monocyte Count
	MONO%	Monocyte Percent
	EO#	Eosinophil Count
	EO%	Eosinophil Percent
	BASO#	Basophil Count
	BASO%	Basophil Percent

Haematology	Code	Parameter name
DIFF	IG#	Immature granulocytes in #
	IG%	Immature granulocytes in %
	NEUT-GI ²	Neutrophil Granularity Intensity
	NEUT-RI ²	Neutrophil Reactivity Intensity
	RE-LYMP# ²	Reactive Lymphocyte Count
	RE-LYMP% ²	Reactive Lymphocyte Percent
	AS-LYMP# ²	Antibody Synthesising Lymphocyte Count
	AS-LYMP% ²	Antibody Synthesising Lymphocyte Percent
WPC	HPC# ³	Haematopoietic Progenitor Cell Count
	HPC% ³	Haematopoietic Progenitor Cell Percent
RET	RET#	Reticulocyte Count
	RET%	Reticulocyte Percent
	RET-HE	Reticulocyte Haemoglobin Equivalent
	LFR	Low Fluorescence Ratio
	MFR	Medium Fluorescence Ratio
	HFR	High Fluorescence Ratio
	IRF	Immature Reticulocyte Fraction
	RBC-He	RBC Haemoglobin equivalent
	Delta-He	Delta-He is derived from the difference between (RET-He) - (RBC-He)
	HYPO-HE	Percentage of hypo-haemoglobinised red cells in RET channel
	HYPER-HE	Percentage of hyper-haemoglobinised red cells in RET channel
PLT-F	IPF ⁴	Immature Platelet Fraction
	IPF#	Immature Platelet Fraction Count
NRBC	NRBC# ⁵	Nucleated RBC Count
	NRBC% ⁵	Nucleated RBC Percent
BF (Bodyfluid)	MN# ⁶	Mononuclear Cell Count
	MN% ⁶	Mononuclear Cell Percent
	PMN# ⁶	Polymorphonuclear Cell Count
	PMN% ⁶	Polymorphonuclear Cell Count
	WBC-BF ⁶	WBC Body Fluid
	RBC-BF ⁶	RBC Body Fluid

Haematology	Code	Parameter name
BF (Bodyfluid)	TC-BF# ⁶	Total cell count body fluid
XN-1500 SMEAR Info ⁷	SMEAR	Status Information
	STAIN	Status Information
	ASP	Status Information

¹ If result "0" means not corrected, if result "1" = corrected (X-Class only)

² Requires EIP license for XN

³ Output analysis results when analysed in the HPC mode

⁴ Analysis results with X-Class in RET channel and with XN-Series in PLT-F channel

⁵ Not available on XN-L series

⁶ Output analysis results when analysed in the Body Fluid mode

⁷ The following status information are possible:

Parameter	Result	Explanation
ASP	OK	Success
	NG	Failure
	NB	No Blood
	CN	Cancelled
SMEAR	OK	Success
	NG	Failure
	NB	No Blood
	CN	Cancelled
STAIN	OK	Success
	NG	Failure
	RC	Recovery slide

For other host codes/parameters please contact your authorised local Sysmex representative.

5.3.2. Urinalysis section

Urinalysis	Code	Parameter name
	RBC	Red blood cell
	WBC	White blood cell
	EC	Epithelial cell
	BACT	Bacteria
	Path.Cast (*)	Pathological Cast
	SRC (*)	Small round cell
	SPERM (*)	Spermatozoa
	X'TAL (*)	Crystal
	MUCUS (*)	Mucus
	COND. (*)	Conductivity (urine conductivity)
	COND-Info ¹	Urinary concentration (urine concentration Information)
	RBC-Info ²	RBC-Information (RBC forms Information)
	UTI-Info ³	UTI-Information
	CAST	Cast
	YLC (*)	Yeast like cell
	LA_RBC (*)	Large-RBC
	S_RBC (*)	Small-RBC
	NL_RBC# (*)	Non-Lysed-RBC#
	NL_RBC% (*)	Non-Lysed-RBC%
	LY_RBC (*)	Lysed-RBC
	TOTAL_SEDch	
	TOTAL_BACch	

¹ COND_Info: The result "0" means "not flagged", "1" means "Rank 1", "2" means "Rank 2", "3" means "Rank 3", "4" means "Rank 4", "5" means "Rank 5"

² RBC_Info: The result "0" means "RBC negative", "1" means "Isomorphic?", "2" means "Dismorphic?", "3" means "Mixed?"

³ UTI_Info: The result of "0" means "not flagged", "1" means "UTI?"

Flag	Meaning
FLAG_REVIEW	"0" means "not flagged" "1" means "REVIEW"

Flag	Meaning
FLAG_ERROR	"0" means "not flagged" "1" means "Analysis error"
FLAG_IDERROR	"0" means "not flagged" "1" means "Analysis error"
SAMPLE_SOURCE ¹	"0" means "Sample collected optionally" "1" means "Sample collected in the morning" "2" means "Sample accumulated during a period of time" "3" means "Sample collected after meal" "4" means "Sample collected through Catheter" "*" means "Uncertain sample"
SAMPLE_COLOR	"0" means "water-white" "1" means "light yellow brown" "2" means "brown" "3" means "yellow brown" "4" means "orange" "5" means "red" "6" means "dark brown" "7" means "green" "8" means "blue" "9" means "milky white" "*" means "Uncertain"
SAMPLE_CLARITY	"0" means "clear" "1" means "slight hazy" "2" means "hazy" "3" means "slightly cloudy" "4" means "cloudy" "*" means "Uncertain"
FLAG_RBC	" " means "not flagged" "+" means "REVIEW" "*" means "Low Reliability"
FLAG_WBC	
FLAG_EC	
FLAG_CAST	
FLAG_BACT	
FLAG_PATCAST	
FLAG_SRC	
FLAG_SPERM	
FLAG_YLC	
FLAG_MUCUS	
FLAG_XTAL	
FLAG_COND	

Extra QC data
S_FSC
S_FSCW
S_FLH
S_FLL
S_FLLW
S_SSC
B_FSC
B_FSCW
B_FLH

(*) Research Parameter Disclaimer

Parameter marked as **(*)** (research parameters) and which are obtained from in vitro examination of specimens derived from the human body used for the purpose of providing information:

- concerning a physiological or pathological state, or
- concerning a congenital abnormality, or
- to determine the safety and compatibility with potential recipients, or
- to monitor therapeutic measures

are not officially intended by Sysmex Europe GmbH to be included in patient's reports as "reportable (diagnostic) parameters".

If the user/licencee of the Sysmex instruments wants to use these Research Parameter + Service Parameter in official diagnosis for patients or in patient reports, he may do so, but before he can use them for this purpose, it is under his own responsibility to make a full evaluation of data, limitations, interferences and complete risk management (ISO 14971) after In-vitro Diagnostic Directive (IVDD 98/79/EC, Annex VIII) and its national transpositions in EU member states law.

5.3.2.1. UF500i/1000i upgrade kits Host codes

The UF series (UF-500i or UF-1000i) can be installed with the optional additional values which can be: "upgrade kit I (BF)" and/or "upgrade kit II (DP)" and/or "upgrade kit III (BACT INFO)". Please contact your authorised local Sysmex representative to get informed about the type(s) of installed option(s).

A. Upgrade kit I (BF)

With the UF500i/1000i upgrade kit I (BF) following new body fluid parameters are available:

Test code	Diagnostic parameter	Research parameter	Service parameter
BF_RBC	X		
BF_WBC	X		
BF_TNC	X		
BF_LC		X	
BF_VOL_SED			X
BF_VOL_BAC			X
BF_RAW_SED			X
BF_RAW_BAC			X
BF_TOTAL_SED			X
BF_TOTAL_BAC			X
BF_FLAG_REVIEW ²			X
BF_FLAG_ERROR ³			X
BF_FLAG_IDERROR ⁴			X

² BF_FLAG_REVIEW: The result of "0" means "not flagged", "1" means "REVIEW"

³ BF_FLAG_ERROR: The result of "0" means "not flagged", "1" means "Analysis error"

⁴ BF_FLAG_IDERROR: The result of "0" means "not flagged", "1" means "ID read error occurred"

B. Upgrade kit II (DP)

With the UF series upgrade kit II following new diagnostic parameters are available:

Test code	Description
NL_RBC	Non lysed RBC #
LARGE_EC	Large Epithelial Cells
SMALL_EC	Small Epithelial Cells
XTALd ¹	Crystals
COND.d ²	Conductivity

¹ SMALL_EC can be resulted as follow:

1: 0 - 1.5 /HPF
 2: 1.6 - 3.0 /HPF
 3: 3.1 - 5.0 /HPF
 4: > 5.0 /HPF

¹ XTALd can be resulted as follow:

1: 0 - 1 /HPF
 2: 1 - 5 /HPF
 3: 6 - 10 /HPF
 4: 11 - 15 /HPF
 5: > 15 /HPF

C. Upgrade kit III (BACT INFO)

With the UF series upgrade kit III following new flag is available:

Test code	Description
BACT-Info ¹	Bact Info

¹ can be resulted as follow:

0 = No judgement

1 = Rods?

2 = Cocci/Mixed?

Disclaimer

Research + Service Parameter

Parameter classified as “research parameters” or “service parameters” and which are obtained from in vitro examination of specimens derived from the human body used for the purpose of providing information:

- concerning a physiological or pathological state, or
- concerning a congenital abnormality, or
- to determine the safety and compatibility with potential recipients, or
- to monitor therapeutic measures

are not officially intended by Sysmex Europe GmbH to be included in patient's reports as “reportable (diagnostic) parameters”. If the user/licencee of the Sysmex instruments wants to use these Research Parameter + Service Parameter in official diagnosis for patients or in patient reports, he may do so, but before he can use them for this purpose, it is under his own responsibility to make a full evaluation of data, limitations, interferences and complete risk management (ISO 14971) after In-vitro Diagnostic Directive. (IVDD 98/79/EC, Annex VIII) and its national transpositions in EU member states law.

5.3.2.2. UX-2000 host codes

The UX-2000 contains out of 3 devices: CHM (Clinical Chemistry), FCM (Flow Cytometry) and CHK (Cross Check).

The FCM parameters are detailed at the chapter 5.3.2.

The CHM parameters are detailed below at point A.

The CHK parameters are detailed below at point B.

A. CHM host codes

The list below details the different CHM diagnostic parameter codes available from the CHM device.

Please contact your authorised local Sysmex representative for the selected CHM parameter codes.

Parameter code	Parameter name	The CHM has 2 types of output formats:	
		Output format type 1	Output format type 2
GLU	Glucose	a. Qualitative value	b. Qualitative value
GLUr		c. Semi-quantitative value	d. Reflectivity value
PRO	Protein	Idem as a.	Idem as b.
PROr		Idem as c.	Idem as d.
BLD	Blood	Idem as a.	Idem as b.
BLDr		Idem as c.	Idem as d.
BIL	Bilubin	Idem as a.	Idem as b.
BILr		Idem as c.	Idem as d.
URO	Urobilinogen	Idem as a.	Idem as b.

Parameter code	Parameter name	The CHM has 2 types of output formats:	
		Output format type 1	Output format type 2
UORr		Idem as c.	Idem as d.
KET	Keton body	Idem as a.	Idem as b.
KETr		Idem as c.	Idem as d.
PH	pH	---	---
PHr		Idem as c.	Idem as d.
NIT	Nitrite salt	Idem as a.	Idem as b.
NITr		---	Idem as d.
LEU	WBC	Idem as a.	Idem as b.
LEUr		Idem as c.	Idem as d.
ALB	Microalbumin	---	----
ALBr		Idem as c.	Idem as d.
CRE	Creatinin	---	---
CREr		Idem as c.	Idem as d.
A/C	Microalbumin – Creatinin Ratio	Idem as a.	Idem as b.
A/Cr		Idem as c.	Quantitative
P/C	Protein – Creatinine Ratio	Idem as a.	Idem as b.
P/Cr		Idem as c.	Quantitative
S.G	Specific Graviity	---	---
S.G.r		Quantitative	Quantitative
TURB	Turbidity	Idem as a.	Idem as b.
TURBr		---	Quantitative
COLOR	Color	---	---
COLORr		Idem as c.	Idem as d.

B. CrossCheck host codes

In case that the UX-2000 is configured to output CrossCheck results following flag will be sent via SUI.

Please contact your authorised local Sysmex representative for the selected CHM result output format.

Parameter code	Possible flag result in OBX-9	Description
CrossCheck1	>	In case CrossCheck 1 is set & triggered at UX-2000 this parameter will be resulted by ">" which represents a positive CrossCheck for CrossCheck 1
CrossCheck2	idem	
CrossCheck3	idem	
CrossCheck4	idem	
CrossCheck5	idem	
CrossCheck6	idem	
CrossCheck7	idem	
CrossCheck8	idem	
CrossCheck9	idem	
CrossCheck10	idem	

C. UX-2000 order profiles management

The UX-2000 is foreseen with order profiles. Please refer the table below which details the 3 existing order profiles:

Profile code	UX-2000	
	CHM order?	FCM order?
Sediment	No	Yes
Basic ¹	Yes	No
Special	Yes	No
Single test code	Depending on the ordered test code i.e. in case of a CHM test code → Yes	Depending on the test code i.e. in case of a FCM test code → Yes

¹ A configuration setting at SUI UX SW allows to map the order profile to the correspondent UX-2000 test strip feeder.

In case the LIS orders "single / multiple" parameter instead of the above listed order profile(s), UX-2000 reacts as follow depending on the ordered parameter(s):

Single CHM parameter	Order mapping to the appropriate CHM test strip Feeder
In case the LIS order contains single CHM parameter(s) except "Creatinin (CRE)" & "Microalbumin (ALB)" parameter, this will be identify as an order for: Meditape II 9U	Feeder 1 or Feeder 2
In case the LIS order contains single CHM parameter(s) with "Creatinin (CRE)" parameter, this will be identify as an order for: Meditape II 10U	Feeder 1 or Feeder 2
In case the LIS order contains single CHM parameter(s) with "Creatinin (CRE)" & "Microalbumin (ALB)" SUIT UX identifies this as an order for: Meditape II 10K	Feeder 1 or Feeder 2

5.3.3. Sample tracking information

General	Code	Parameter name
Sampletracking	H_TUBE	Haematology Tube position in the rack
	H_RACK	Haematology Rack identification
	H_INST	Haematology Instrument name
	H_INID	Haematology Instrument ID
	U_TUBE	Urinalysis Tube position in the rack
	U_RACK	Urinalysis Rack identification
	U_INST	Urinalysis Instrument name
	U_INID	Urinalysis Instrument ID

5.4. Appendix D: Interpretation-Flags (IP Flags)

If a single analyser is directly connected to LIS, these flags will be in use. The UF-1000i/UF-500i is also able to transmit up to 8 customizable additional flags.

Flagname (IP messages)	XE-2100	XE-2100D	XE-2100L	XT-2000i	XT-1800i	XS-Series	XT-4000i	XE-5000	XN-Series	XN-L-Series	UF-Series UX-2000
WBC_Abn_Scattergram	•	•	•	•	•	•	•	•	•	•	
NRBC_Abn_Scattergram	•		•					•			
Neutropenia	•	•	•	•	•	•	•	•	•	•	
Neutrophilia	•	•	•	•	•	•	•	•	•	•	
Lymphopenia	•	•	•	•	•	•	•	•	•	•	
Lymphocytosis	•	•	•	•	•	•	•	•	•	•	
Leukocytopenia	•	•	•	•	•	•	•	•	•	•	
Leukocytosis	•	•	•	•	•	•	•	•	•	•	
Monocytosis	•	•	•	•	•	•	•	•	•	•	
Eosinophilia	•	•	•	•	•	•	•	•	•	•	
Basophilia	•	•	•	•	•	•	•	•	•	•	
NRBC_Present	•		•					•	•		
IG_Present	•	•	•	•	•		•	•	•	•	
RBC_Abn_Distribution	•	•	•	•	•	•	•	•	•	•	
Dimorphic_Population	•	•	•	•	•	•	•	•	•	•	
Anisocytosis	•	•	•	•	•	•	•	•	•	•	
Microcytosis	•	•	•	•	•	•	•	•	•	•	
Macrocytosis	•	•	•	•	•	•	•	•	•	•	
Hypochromia	•	•	•	•	•	•	•	•	•	•	
Anemia	•	•	•	•	•	•	•	•	•	•	
Erythrocytosis	•	•	•	•	•	•	•	•	•	•	
RET_Abn_Scattergram	•			•			•	•	•	•	
Reticulocytosis	•			•			•	•	•	•	
PLT_Abn_Scattergram	•			•			•	•	•	•	
PLT_Abn_Distribution	•	•	•	•	•	•	•	•	•	•	

Flagname (IP messages)	XE-2100	XE-2100D	XE-2100L	XT-2000i	XT-1800i	XS-Series	XT-4000i	XE-5000	XN-Series	XN-L-Series	UF-Series UX-2000
Thrombocytopenia	•	•	•	•	•	•	•	•	•	•	
Thrombocytosis	•	•	•	•	•	•	•	•	•	•	
Blasts?	•	•	•	•	•	•	•	•	•		
Immature_Gran?	•	•	•	•	•	•	•	•			
NRBC?	•	•	•	•	•	•	•	•		•	
Left_Shift?	•	•	•	•	•	•	•	•	•	•	
Atypical_Lympho?	•	•	•	•	•	•	•	•	•	•	
RBC_Lyse_Resistance?	•	•	•	•	•		•	•			
Abn_Lympho/L-Blasts?	•		•					•			
Abn_Lympho/Blasts?		•		•	•		•				
Blasts/Abn_Lympho?								•	•		
Abn_Lympho?						•			•		
RBC_Agglutination?	•	•	•	•	•	•	•	•	•	•	
Turbidity/HGB_Interference?	•	•	•	•	•	•	•	•	•	•	
Iron_Deficiency?	•	•	•	•	•	•	•	•	•	•	
HGB_Defect?	•	•	•	•	•	•	•	•	•	•	
Fragments?	•	•	•	•	•	•	•	•	•	•	
PLT_Clumps?	•	•	•	•	•	•	•	•	•	•	
PLT_Clumps(S)?	•	•	•	•	•	•	•	•			
Giant_Platelet?									•		
iRBC? ¹									•	•	
iRBC?(R) ¹									•	•	
Debris_High											•
Discr_Error_RBC/XTAL											•
Discr_Error_RBC/BACT											•
Discr_Error_RBC/YLC											•
Urine_Conductivity_abnormal											•
Carry_Over?											•

¹ Depending on analyser setting, the IP message can be “pRBC?” or “pRBC?(R)”. For further details please contact your authorized local Sysmex representative”

5.4.1. Action & Error Messages and positive flagging information

Flagname	XE-2100	XE-2100D	XE-2100L	XT-2000i	XT-1800i	XS-Series	XT-4000i	XE-5000	XN-Series	XN-L-Series
Action_MESSAGE_RET	•			•			•	•		
Action_MESSAGE_NRBC	•		•					•		
Action_MESSAGE_Delta	•	•	•	•	•	•	•	•		
Action_MESSAGE_DIFF	•	•	•	•	•	•	•	•		
Positive_Diff	•	•	•	•	•	•	•	•	•	•
Positive_Morph	•	•	•	•	•	•	•	•	•	•
Positive_Count	•	•	•	•	•	•	•	•	•	•
Error_Func	•	•	•	•	•	•	•	•	•	•
Error_Result	•	•	•	•	•	•	•	•	•	•
ACTION_MESSAGE_Delta									•	•
ACTION_MESSAGE_DELTA_WBC									•	•
ACTION_MESSAGE_DELTA_HGB									•	•
ACTION_MESSAGE_DELTA_MCV									•	•
ACTION_MESSAGE_DELTA_PLT									•	•
ACTION_MESSAGE_WBC									•	
ACTION_MESSAGE_RBC									•	•
ACTION_MESSAGE_Review_PLT									•	•
ACTION_MESSAGE_PLT									•	•
ACTION_MESSAGE_Suspect_Sample									•	
ACTION_MESSAGE_Aged_Sample?									•	•
ACTION_MESSAGE_Retest_eosinophil									•	

5.5. Appendix E: Optional specification of OBR-3 management

To be compatible to some installations of SIS/PC-DPS it's also possible to use this specification for the OBR-3 / OBR-4.

(3)	ONO	OBR-3	Requester specimen ID or accession number	Sample No. (Barcode No.)* (HOST side)	29	Y	N
(4)	<u>SNO</u>	OBR-4	Producer specimen ID or accession number	Sample No. (Barcode No.)* (SUIT side)	29	N	Y

5.6. Appendix F: Case Manager

Please contact your authorised local Sysmex representative if the Case Manager (CM) is used.

5.6.1. Case Manager specific test codes & test names

Please find below the details of the test codes with its test names that the Case Manager could send in the OBX-4 segment.

Test code	Test name
Case_Manager_A	Case_Manager_A
Case_Manager_B	Case_Manager_B
Case_Manager_C	Case_Manager_C
Case_Manager_D	Case_Manager_D
Case_Manager_E	Case_Manager_E
Case_Manager_F	Case_Manager_F
Case_Manager_G	Case_Manager_G
Case_Manager_H	Case_Manager_H
Case_Manager_I	Case_Manager_I
Case_Manager_J	Case_Manager_J
Case_Manager_K	Case_Manager_K
Case_Manager_L	Case_Manager_L
Case_Manager_M	Case_Manager_M
Case_Manager_N	Case_Manager_N
Case_Manager_O	Case_Manager_O
Case_Manager_P	Case_Manager_P
Case_Manager_Q	Case_Manager_Q
Case_Manager_R	Case_Manager_R
Case_Manager_S	Case_Manager_S
Case_Manager_T	Case_Manager_T

5.6.2. Case Manager Results

Please find below the details (refer to the "Description" column) of the test result that the Case Manager could send in the OBX-6 segment. Each description is identified by a code for internal management i.e. this code is not sent to the host

Case No.	Description
1	1: Suspicion of Microangiopathic Haemolytic Disease as cause of thrombocytopenia?
2	2: Suspicion of HELLP syndrome?
3	3: Suspicion of Autoimmune Thrombocytopenia?
4	4: Suspicion of platelet transfusion requirement due to suppressed thrombopoiesis?
5	5: Suspicion of Malaria associated Disseminated Intravascular Coagulation?
6	6: Suspicion of Essential Thrombocythaemia?
7	7: Suspicion of Thalassaemia Minor as cause of microcytic hypochromic anaemia?
8	8: Suspicion of Megaloblastic Anaemia?
9	9: Suspicion of imminent platelet count recovery post bone marrow suppression?
10	10: Suspicion of Polycythaemia vera as cause of extreme thrombocytosis?
11	11: Suspicion of iron deficient Polycythaemia vera as cause of thrombocytosis?
12	12: Suspicion of Iron deficiency as the cause of microcytic hypochromic anaemia?
13	13: Suspicion of Polycythaemia vera as the cause of erythrocytosis?
14	14: Suspicion of reactive erythrocytosis?
15	15: Suspicion of Thalassaemia Intermedia?
16	16: Suspicion of immune mediated intravascular haemolysis as cause of anaemia?
17	17: Suspicion of immune mediated extravascular haemolysis as cause of anaemia?
18	18: Suspicion of intravascular haemolytic anaemia due to microangiopathy (MAHA)
19	19: Suspicion of Thalassaemia Intermedia with marked haemolysis?
20	20: Suspicion for extravascular haemolysis due to hereditary spherocytosis?
21	21: Suspicion of Myelodysplastic Syndrome - Refractory Anaemia with Excess Blasts?
22	22: Suspicion of Myelodysplastic Syndrome as cause of anaemia ?
23	23: Suspicion of Acute Erythroleukaemia?
24	24: Suspicion of Myelodysplastic Syndrome as cause of pancytopenia?
25	25: Suspicion of Chronic Myelomonocytic Leukaemia despite absence of dysplasia?
26	26: Suspicion of Chronic Myelomonocytic Leukaemia ?
27	27: Suspicion of Atypical Chronic Myeloid Leukaemia (with dysplasia)?

5.6.3. Log file example

Please find below some log file examples of Case Manger transaction:

```
H|^~\&|||||||A.2|201002181450
P|1|001|||FirstName^LastName||19200808|M|||||0.0|0.0|||||^Internal|||||20100218
OBR|1||12345| CASE_MANAGER_A^CASE_MANAGER_A|||||||201002181450|||||||
OBX|1|NM|h_rack^RACK|||||F|201002181450|||
OBX|2|NM|h_tube^TUBE|||||F|201002181450|||
OBX|3|ST|h_inst^Inst.||11001||||F|201002181450|||
OBX|4|ST|h_inID^ analyser||XE-5000||||F|201002181450|||
OBX|5|ST|CASE_MANAGER_A^CASE_MANAGER_A||1: Suspicion of Microangiopathic Haemolytic Disease as cause of
thrombocytopenia?||||F|201002181450|||
L|1||1|9

H|^~\&|||||||A.2|201002181450
P|1|002|||FirstName^LastName||19200808|M|||||0.0|0.0|||||^Internal|||||20100218
OBR|1||23456|CASE_MANAGER_A^CASE_MANAGER_A~ CASE_MANAGER_B^CASE_MANAGER_B~CASE_MANAGER_C^CASE_MANA
GER_C|||||||201002181450|||||||
OBX|1|NM|h_rack^RACK|||||F|201002181450|||
OBX|2|NM|h_tube^TUBE|||||F|201002181450|||
OBX|3|ST|h_inst^Inst.||11001||||F|201002181450|||
OBX|4|ST|h_inID^ analyser||XE-5000||||F|201002181450|||
OBX|5|ST|CASE_MANAGER_A^CASE_MANAGER_A||1: Suspicion of Microangiopathic Haemolytic Disease as cause of
thrombocytopenia?||||F|201002181450|||
OBX|6|ST|CASE_MANAGER_B^CASE_MANAGER_B||2: Suspicion of HELLP syndrome?||||F|201002181450|||
OBX|0|ST|CASE_MANAGER_C^CASE_MANAGER_C||27: Suspicion of Atypical Chronic Myeloid Leukaemia (with
dysplasia)?||||F|201002181450|||
L|1||1|11
```