HORIBA ABX
Diagnostics

OUTPUT FORMATS

MICROS

RAA031BEN

Table of Contents

Introduction

ABX Format is currently supported to be compliant with earlier instruments or existing connections.

Table 1: Definitions

Term	Definition
<ACK>	Acknowledgment (ASCII Decimal 6)
[C1]	The most significant character of Checksum
[C2]	The least significant character of Checksum
[DATA]	The data contents of the record
<ENQ>	Inquire (ASCII Decimal 5)
<ETB>	End of Transmission Block (ASCII Decimal 23). For use only when a single record is too large to fit into one frame.
<ETX>	End of Text (ASCII Decimal 3). Required at the end of each record.
[frame number]	Single digit frame number “0” to “7”, starts with “1”.
<LF>	Line Feed (ASCII Decimal 10).
<NAK>	Negative Acknowledgment (ASCII Decimal 21).
<STX>	Start of Frame (ASCII Decimal 2).
Communications packet	All framing required for transmission of data. This framing includes: <STX>[frame number][DATA] [<ETB> or <ETX>][C1][C2] <LF>
Component Field	One of several related pieces of information within a field.
Field	A specific location within a record for a piece of information, indicated by a field delimiter and position.
Frame	A complete communications packet.
LIS	Laboratory Information System
Message	A collection of related information; a group of records that begins with a «Header» record and ends with a «Terminator» record. A single record could theoretically constitute a message, but within this context, a message always contains multiple records.

Table 1: Definitions

Term	Definition
<EOT>	End of Transmission (ASCII decimal 4)
<CR>	Carriage Return (ASCII decimal 13)
Record	In reference to the low level protocol, a record is the message data (shown as [DATA]) as described within the communications packet. If the data is longer than 240 characters, then it must be split in two (or more) parts and sent in two (or more) communications packets. The intermediate packet uses the <ETB> character, and the ending packet uses the <ETX> character. No single communications packet contains more than one record. In reference to the message layer, a record can be one of the following codes: H (header), P (patient), O (order), R (result), L (terminator), C (comment).
Session	A total unit of communication activity used in this standard to indicate the events starting with the Establishment phase and ending with the Termination phase.
Test	A determination of a single analyte or a combination of values from other determinations or observations from which a variable or gradable result is derived.

Format compatibility

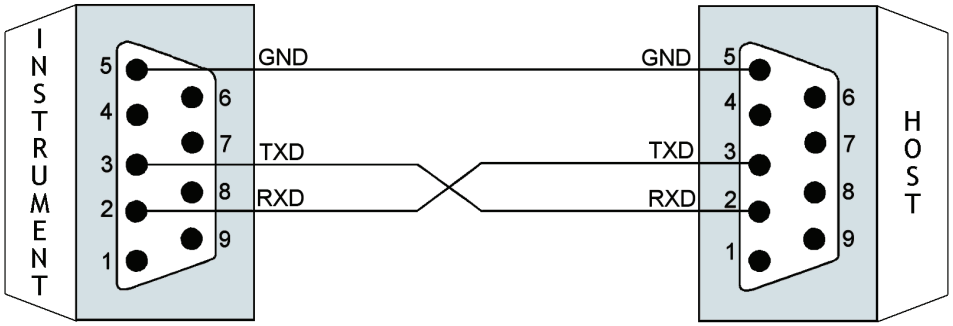
Table 2: Format compatibility according to HORIBA ABX analyzers and types of analyses

	HORIBA ABX Analyzers	Micros			Micros 60			Micros CRP		
Analysis types	Output Formats	ABX	ASTM	Argos	ABX	ASTM	Argos	ABX	ASTM	Argos
LMG (CBC+LMG)		X		X	X		X	X		X
CRP								X		X

Physical connection (RS232)

Instrument RS DB9

- GND: ground
- TXD: transmission
- RXD: reception



ABX Format

1. Overview

- ABX format supports unidirectionnal or bidirectionnal connections.
- ABX format can have a different numbers of fields according to the transmitted items set up by the user (results, curves, flags, etc...) or to the type of cycle.
- Fields sequence is not fixed.
- The result identifier is different according to the type of result: patient result («RESULT»), QC result (QC-RES) etc...

2. Protocol description

2.1. Unidirectionnal mode

2.1.1. Typical unidirectionnal transmission from Instrument to Host

Table 3: Typical unidirectionnal transmission from Instrument to Host

Instrument	< >	Host	Comment
<STX> + RESULT + <ETX>	>		

2.1.2. Typical unidirectionnal transmission from Instrument to Host with «SOH»\»EOT»

«SOH»\«EOT» option must be enabled on the instrument.

Table 4: Typical unidirectionnal transmission with «SOH»\»EOT» from Instrument to Host

Instrument	< >	Host	Comment
<SOH>	>		Instrument takes the Line
<STX> + RESULT + <ETX>	>		
	.		
	.		
	.		
<STX> + RESULT + <ETX>	>		
<EOT>	>		Instrument frees the Line

3. Message structure

3.1. Lines structure

HEADER:

- STX
- Size + carriage return (Size: 5 bytes representing the total amount of the data except STX and ETX).
- Identifier followed by a Load Type + carriage return (Load: 8 character string preceeded by a blank indicating the type of data).

.....

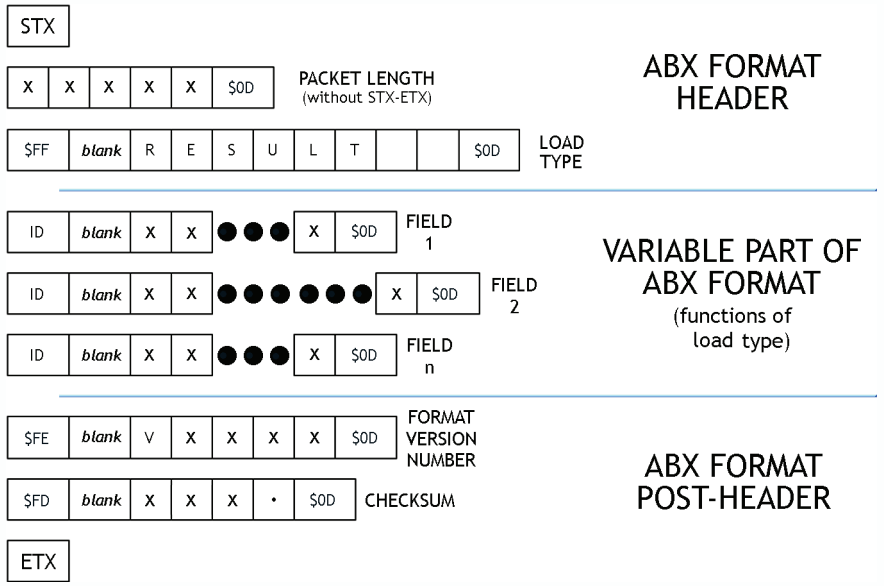
VARIABLE PART:

- Identifier followed by the Information associated to the Load Type + carriage return (Identifier: 1 byte moving about $21 to $FF, it describes the information type which follows this indicator, always followed by a blank character $20).
- Remainder of the other Identifiers and Information associated to the Load Type + carriage returns.
- Other Load Type blocs + Associated Information

.....

POST-HEADER:

- Identifier followed by CheckSum + carriage return (CheckSum: Sum modulo 65536 of all characters except ETX, STX and all information about checksum (identifier - space - checksum - carriage return) in the hexadecimal format on 4 bytes, preceeded by a blank character $20).
- ETX



Diag.1: ABX format line structure

3.2. Control characters

Table 5: Standard control characters

Control String	Hexadecimal value
<ENQ>	$05
<ACK>	$06
<NAK>	$15
<STX>	$02
<ETX>	$03

Table 5: Standard control characters

Control String	Hexadecimal value
<CR>	$0D
<LF>	$0A
<EOT>	$04
<SOH>	$01

- NOTE 1 ($79)
0 or Blank: Unspecified, 1: Male, 2: Female.

- NOTE 2 ($7F)
$7F must be one of the instrument blood type list. If not, it is generated according to the age ($78) or for adults by the sex ($79).

- NOTE 3 ($80)
See Table 2, “Format compatibility according to HORIBA ABX analyzers and types of analyses”, page 4 to see test compatibility with the instrument:

'A': CBC
'D': LMG (CBC+LMG)

4. Data transmitted by the analyzer to the host

4.1. Packet type

The information described in the packet type allows the specification of the global message content: hematological routine results or statistic results.

Table 6: Packet type list

Data packet string (8 characters)	Use
RESULT	Hematological result transmission on a routine mode
QC-RES-H	Result transmission of a high level control blood
QC-RES-M	Result transmission of a median level control blood
QC-RES-L	Result transmission of a low level control blood
FILE	Patient file request
END	Connection end

4.2. Identifier list (Instrument to Host)

Table 7: Identifier list (Instrument to Host)

Identifier	Correspondance	Example	Length	Format	See Note
$70 p	Analyzer number	01	2+2+1	Integers	
$71 q	Analysis date and time	03/01/05 13h15mn31s	2+19+1	String(19)	
$72 r	Analyzer run number	115 or 005CBC06	2+16+1	String(16)	
$73 s	Analyzer sequence number				
$74 t	Sampling mode	M: manual (open tube) R: rack (close tube)	2+1+1	String(1)	
$75 u	Id # or sample id.	1450302154275-42	2+16+1	String(16)	
$76 v	Id. or patient name	SMITH Ronald	2+30+1	String(30)	

Table 7: Identifier list (Instrument to Host)

Identifier	Correspondance	Example	Length	Format	See Note
$77 w	Birth date	16/03/72 or 03161972	2+8+1	nn/nn/nn or nnnnnnnn	
$78 x	Age	7d or 4w or 10m or 54y or 100	2+3+1	String(3)	
$79 y	Sex	0, 1 or 2	2+1+1	String(1)	1
$7A z	Origin	x	2+1+1	String(1)	
$7B {	Doctor	Dr Jones	2+15+1	String(15)	
$7C |	Department	Cardiology	2+10+1	String(10)	
$7D }	Collection date	06/08/99 13h15	2+14+1	nn/nn/nn nnhnn	
$7E ~	Comments		2+32+1	String(32)	
$7F	Blood type	man	2+16+1	String(16)	2
$80 ç	Analysis type	A	2+1+1	String(1)	3
$81 ü	Sample rack type	0: 10 positions 1: 15 positions 2: 32 positions	2+1+1	Integer	
$82 é	Number of runs	0, 1, ...	2+1+1	Integer	
$83 â	Operator code	Bob	2+3+1	String(3)	

4.2.1. Numerical result fields

- Units are Standard units.
- If one parameter cannot be calculated by the analyzer, the field is replaced with --.--

Parameter status:

Following the numerical field, a first digit gives the counting rejection status or the suspicion, a second one gives the parameter value status according to high and low normalities, to high and low extreme values and to the overloading capacities.

Table 8: Identifier First digit

First digit (letter)	Correspondance
$52 R	Parameter rejected for a counting default
$42 B	Incorrect balance between the counting methods
$53 S	Suspicious parameter value
$20 blank	No anomaly observed

Table 9: Identifier Second digit

Second digit (letter)	Correspondance
$42 B (french) or $4C L (other languages)	Parameter < to the lower extreme value
$62 b (french) or $6C l (other languages)	Parameter < to the low normal value
$20 blank	Parameter normal value
$68 h	Parameter > to the high normal value
$48 H	Parameter > to the high extreme value
$43 C	Platelet concentrate
$4F O	Parameter exceeding the capacity

Example: 5.5 millions RBC with a counting error in the standard units:

$32 $20 $30 $35 $2E $35 $30 $52 $68 $0D or

«2 05.50Rh» + carriage return

Table 10: CBC numerical result fields list

Identifier	Correspondance	Example	Format (Length)
$21 !	WBC	07.40	2+String(7)+1
$32 2	RBC	04.64	2+String(7)+1
$33 3	Hgb	14.17	2+String(7)+1

Table 10: CBC numerical result fields list

Identifier	Correspondance	Example	Format (Length)
$34 4	Hct	43.95	2+String(7)+1
$35 5	MCV	94.68	2+String(7)+1
$36 6	MCH	30.53	2+String(7)+1
$37 7	MCHC	32.24	2+String(7)+1
$38 8	RDW	12.98	2+String(7)+1
$40 @	PLT	00401	2+String(7)+1
$41 A	MPV	07.94	2+String(7)+1
$42 B	THT	0.318	2+String(7)+1
$43 C	PDW	13.50	2+String(7)+1

Table 11: LMG numerical result fields list

Identifier	Correspondance	Example	Format (Length)
$21 !	WBC	07.40	2+String(7)+1
$22 "	Lymphocytes (#)	02.03	2+String(7)+1
$23 #	Lymphocytes (%)	27.40	2+String(7)+1
$24 $	Monocytes (#)	00.70	2+String(7)+1
$25 %	Monocytes (%)	09.40	2+String(7)+1
$26 &	Granulocytes (#)	04.67	2+String(7)+1
$27 '	Granulocytes (%)	63.20	2+String(7)+1
$32 2	RBC	04.64	2+String(7)+1
$33 3	Hgb	14.17	2+String(7)+1
$34 4	Hct	43.95	2+String(7)+1
$35 5	MCV	94.68	2+String(7)+1
$36 6	MCH	30.53	2+String(7)+1
$37 7	MCHC	32.24	2+String(7)+1
$38 8	RDW	12.98	2+String(7)+1

Table 11: LMG numerical result fields list

Identifier	Correspondance	Example	Format (Length)
$40 @	PLT	00401	2+String(7)+1
$41 A	MPV	07.94	2+String(7)+1
$42 B	THT	0.318	2+String(7)+1
$43 C	PDW	13.50	2+String(7)+1

Table 12: CRP numerical result field list (Micros CRP)

Identifier	Correspondance	Example	Format (Length)
$4B K	C-Reactive protein	.0600	2+String(7)+1

4.2.2. Flag fields

Flags are transmitted in a comprehensive mode (same presentation than on the screen, that is to say dependant from the language).

They are replaced with blanks when the flag is not detected.

In the following tables, identifier's formats are separated by blanks only for a better comprehension.

Table 13: Identifier list (English and other languages)

Identifier	Parameter	Format	Length
$50 P	WBC or LMG	L1 M1 M2 G1 G2 G3	2+12+1
$53 S	Plt	Pc Sc Mc	2+6+1

Table 14: Identifier list (French)

Identifier	Parameter	Format	Length
$50 P	GB ou LMG	L1 M1 M2 G1 G2 G3	2+12+1
$53 S	Plaquettes	Pc Sc Mc	2+6+1

4.2.3. Pathology messages fields

Each pathology is described by a group of 4 characters followed by a blank character, except for the last pathology.

The content of the pathology is dependent from the chosen language.

Only detected pathologies are transmitted. A common header (????) to the 4 Pathology message groups indicates that the pathological interpretation is impossible.

Table 15: Identifier list

Identifier	Parameter	Format	Length
$54 T	WBC	String of characters	2+(12(max.)x4)+1
$55 U	RBC	String of characters	2+(7(max.)x4)+1
$56 V	PLT	String of characters	2+(4(max.)x4)+1

When there is no pathological message, length is: 2+0+1

4.2.4. Histograms

4.2.4.1. Histograms

Histograms are transmitted on 128 channels, preceeded by a blank. They are automatically rescaled to a 223 maximum amplitude value. The zero amplitude value is $20, the maximum amplitude value is $FF.

Extended format:

The extended format includes all the heigth information relative to each channel. It is constituted by a chart of 256 [RES] entries of 16 bits each.

These 512 bytes chart is encoded before being transmitted. The format is as follow: identificator, blank, encoding type on 8 characters, blank, encoded data size on 5 characters, blank, data then carriage return.

4.2.4.2. Separation thresholds

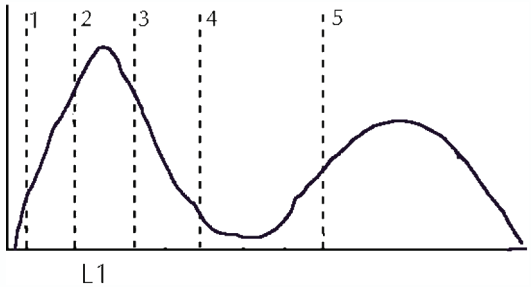
It is the channel number (decimal value) enclosing areas on the histograms. Each threshold is transmitted on 3 bytes preceeded by a blank.

A. WBC thresholds

Separation thresholds 1-2-3 allow the L1 flag determination. For the analyzers in LMG mode, the 4-5 thresholds allow the separation of the 3 populations Lymphocytes, Monocytes, Granulocytes.

Example 1: output format of the WBC curve thresholds for an LMG sampling. In this example, the analyzer does not send the calculation thresholds of the L1 flag.

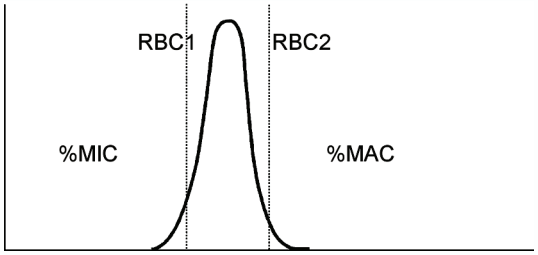
«] 000 000 000 040 060» + carriage return.



Diag.2: WBC histogram

B. RBC thresholds

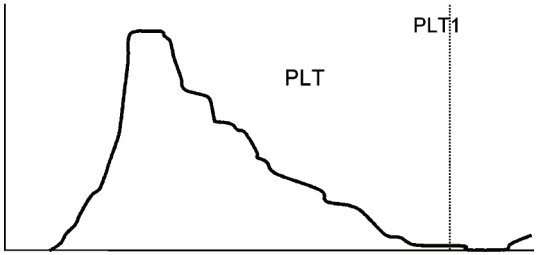
Separation thresholds 1-2 allow the calculation of the microcytic and macrocytic cell proportions.



Diag.3: RBC histogram

C. PLT thresholds

The threshold 1 is the number of the last channel used to calculate the PLT number.



Diag.4: Plt histogram

Table 16: Histogram identifiers

Identifier	Parameter	Format	Length
$57 W	WBC	Amplitude of each channel	2+128+1
$58 X	RBC	Amplitude of each channel	2+128+1
$59 Y	Plt	Amplitude of each channel	2+128+1
$5D]	WBC thresholds	5 thresholds	1+20+1
$5E ^	RBC thresholds	2 thresholds	1+8+1
$5F _	PLT thresholds	1 threshold	1+4+1
$6C l	WBC	extended format	see description
$6D m	RBC	extended format	see description
$6E n	PLT	extended format	see description
$6F o	BASO	extended format	see description

4.2.5. Other identifiers

Identifier $FB: Identifies the analyzer type when communicating.

Identifier $FC: This identifier allows the transmission of a number which can be an error number, a position number, a burn-in sequence number or a status in hexadecimal mode.

Identifier $FD: Checksum value (see section on the message structure).

Identifier $FE: The version number is linked to the development of the hematological message identifiers.

Identifier $FC: The error list is dedicated to the "remote" mode, however the MICROS instrument is able to transmit the error #0001 (Operating temperature out of limits).
For $FB and $FF, the strings having less than 8 characters are completed on the right side by blanks.

Table 17: Other identifiers

Identifier	Correspondance	Format	Length
$FB	Analyzer name	Character string	2+8+1
$FC	Number	8 decimal bytes	2+8+1
$FD	16 bits checksum value	4 hexadecimal bytes	2+4+1
$FE	Version N° of Identifier list	String of characters: Vx.xx	2+5+1

Table 18: $FB Analyzer name

Identifier	Name (8 characters)
$FB	MICROS45
	MICROS60
	CRP

5. Example of data frame

5.1. Example of result sent by instrument

```
FF    RESULT
70    73
71    07/06/06 17h37mn09s
75    0000000000000001
73    0001
76
74    R
80    D
21    005.1
32    05.01
33    014.5
34    044.7
35    089.3
36    029.1
37    032.6
38    016.1 h
40    00174
41    008.7
42    .151
43    013.3
23    051.9 h
25    014.9 h
27    033.2 l
22    002.6
24    000.7
26    001.8
57          !.G`jzÀßÿÿüáÃ‖xo_\TQHHKNRQRONMMQROK...
58            %$!"!"!""$#$'+.4<QWc‖ÆÑõ×êüÿêÖÓÐ»Ö§‖...
59           "".<CCFHONQRVTXO^Y^QXTVKLHE@B=<69:::...
53     Sc
5F    105
50      M2G1G2
5D    000 000 000 026 037
FB    CRP
FE    V2.8
FD    9D8E
```

Diag.5: Example of result sent by instrument (LMG test)

```
FF    RESULT
70    73
71    07/06/06 18h01mn26s
75    0000000000000002
73    0004
76
74    R
80    D
21    005.4
32    05.01
33    014.3
34    044.6
35    089.0
36    028.6
37    032.1
38    016.4 h
40    00184
41    008.6
42     .157
43    014.4
23    052.5 h
25    013.0 h
27    034.5 l
22    002.8
24    000.7
26    001.9
4B    --.-- e
57          !+?Ys▌'ÇæûÿóÛ½▌▌I'XUTQMKKKLMPSSQQPPMLI...
58            ''$''#!!''!''''##&*+5=QY¡▌▌°ÃÚøÚçÿðÝÙÔÑµÈ¢¾▌▌▌...
59           ''(4BHJGGST[W[ZUQTUUWQPEAEGKGEEDHG...
53
5F    105
50       M2G1G2
5D    000 000 000 025 035
FB    CRP
FE    V2.8
FD    9E94
```

Diag.6: Example of result sent by instrument (LMG+CRP test)

5.2. Example of QC result sent by instrument

```
FF    QC-RES
70    73
71    07/06/06 17h45mn40s
75    0000000000000---
73    0002
76
74    R
80    D
21    004.8
32    04.95
33    014.4
34    044.0
35    089.1
36    029.2
37    032.8
38    016.2
40    00170
41    008.8
42     .150
43    015.0
23    064.9
25    021.3
27    013.8
22    003.1
24    001.0
26    000.7
57           '<Uh▌▌Ëëÿ÷ëÑ³▌ib[WWWWTQLLJJJLLNPSMNN...
58             #$''!!'''' ##''#')+6?QYi▌«£ÁÞóÜè÷ÿÒÚÛÐ¸¼¥² ▌'▌...
59           !$+47:<EELLQNRUQNILXc]NHIIFHBB<97:@@?:...
53
5F    105
50
5D    000 000 000 035 053
FB    CRP
FE    V2.8
FD    9A0A
```

Diag.7: Example of QC result sent by instrument (LMG)

ARGOS Format

Argos Format is no longer supported on new system generation.

1. Introduction

The ARGOS format is a fixed format included between STX and ETX. These characters are splitted into fields representing a transmitted item.

STX	DATA	CRC	ETX

The data transmitted can be a result:

STX	«R» / ANALYSER # / N°ID / ID / etc..	CRC	ETX

or a patient file:

STX	«D» / ANALYSER # / N°ID / ID / etc..	CRC	ETX

or end of communication:

STX	«E» / ANALYSER # / etc..	CRC	ETX

The fields have a fixed length separated by the $0D character.

2. Protocol description

2.1. Typical transmission from Host to Instrument

Table 19: Typical transmission from Host to Instrument

Host	< >	Instrument	Comment
<SOH>	>		Host takes the Line
	<	<ENQ>	
<STX> + FILE + <ETX>	>		
	<	<ACK>	
	.		
	.		
	.		
<STX> + END + <ETX>	>		Host frees the Line
	<	<ACK>	

2.2. Typical transmission from Instrument to Host

Table 20: Typical transmission from Instrument to Host

Instrument	< >	Host	Comment
<SOH>	>		Instrument takes the Line
	<	<ENQ>	
<STX> + RESULT + <ETX>	>		
	<	<ACK>	
	.		
	.		

Table 20: Typical transmission from Instrument to Host

Instrument	< >	Host	Comment
	.		
<STX> + END + <ETX>	>		Instrument frees the Line
	<	<ACK>	

3. Results characteristics

3.1. Key

Total ASCII characters emitted: 406

- (-) : blank $20

- (|) : Carriage return $0D

- CRC : exclusive «OR» of all the transmitted bytes except ETX and STX, then an inclusive «OR» with a $4O value.

- zzzzz : numeric field completed by zeros on the left.

ex : 04.55 (decimal separation with a period).

When the analyser does not transmit parameters, the field (zzzzz) replaces (--.--).

- Y : Alphanumeric character from $20 to $7F.

- # : blank ($20) if automatic sampling. Star ($2A) if manual sampling.

Table 21: Line free format first digit (R: Reject)

First digit (letter)	Correspondance
R	Parameter rejected for a counting default
B	Incorrect balance between the counting methods
S	Suspicious parameter value
blank	No anomaly observed

Table 22: Line free format second digit (N: Normailities)

Second digit (letter)	Correspondance
L	Parameter < to the lower extreme value
l	Parameter < to the low normal value
blank	Parameter normal value

Table 22: Line free format second digit (N: Normailities)

Second digit (letter)	Correspondance
h	Parameter > to the high normal value
H	Parameter > to the high extreme value
O	Parameter exceeding the capacity

3.2. Result format

Table 23: Result format

Line	Data	Comment	Length
Line 1	STX ($02)	Start of text	1
	R ($44)	Character «R»	1
	zz]	Analyser No	2 + 1
Line 2	YYYYYYYYYYYYYYY]	Identification No	16 + 1
Line 3	YYYYYYYYYYYYYYYYYYYYYYYYYYYYYY]	Identification	30 + 1
Line 4	zz/zz/zz-zzhzzmnzzs#]	Time & Date	20 + 1
Line 5	zzzzz-RN]	WBC	8 + 1
Line 6	zzzzz-RN]	LYM#	8 + 1
Line 7	zzzzz-RN]	LYM%	8 + 1
Line 8	zzzzz-RN]	MON#	8 + 1
Line 9	zzzzz-RN]	MON%	8 + 1
Line 10	zzzzz-RN]	GRA#	8 + 1
Line 11	zzzzz-RN]	GRA%	8 + 1
Line 12	zzzzz-RN]	NEU#	8 + 1
Line 13	zzzzz-RN]	NEU%	8 + 1
Line 14	zzzzz-RN]	EOS#	8 + 1
Line 15	zzzzz-RN]	EOS%	8 + 1

Table 23: Result format

Line	Data	Comment	Length
Line 16	zzzzz-RN]	BAS#	8 + 1
Line 17	zzzzz-RN]	BAS%	8 + 1
Line 18	zzzzz-RN]	ALY#	8 + 1
Line 19	zzzzz-RN]	ALY%	8 + 1
Line 20	zzzzz-RN]	LIC#	8 + 1
Line 21	zzzzz-RN]	LIC%	8 + 1
Line 26	zzzzz-RN]	RBC	8 + 1
Line 27	zzzzz-RN]	HGB	8 + 1
Line 28	zzzzz-RN]	HCT	8 + 1
Line 29	zzzzz-RN]	MCV	8 + 1
Line 30	zzzzz-RN]	MCH	8 + 1
Line 31	zzzzz-RN]	MCHC	8 + 1
Line 32	zzzzz-RN]	RDW	8 + 1
Line 34	zzzzz-RN]	PLT	8 + 1
Line 35	zzzzz-RN]	MPV	8 + 1
Line 36	zzzzz-RN]	PCT	8 + 1
Line 37	zzzzz-RN]	PDW	8 + 1
Line 38	ABCDEFGHIJKLMNOPQRSTU]	WBC 5DIFF flags	21 + 1
Line 39	LMMGGG]	WBC LMG Flag	6 + 1
Line 40	PSM]	Plt Flags	3 + 1
Line 41	CRC		1
Line 42	ETX ($03)	end of text	1
		Total:	**406**

Table 24: WBC 5DIFF Flags (Line 38)

A	Lg	LL
B	Ln	NL
C	Mn	MN
D	Ng	LN
E	Md	RM
F	Nd	RN
G	No	NO
H	Co	CO
I	Ne	NE
J	X2	X2
K	X3	X3
L	MP	MP
M	LOW	LOW
N	LAS	LAS
O	PIT	PIT
P	Mb	MB
Q	FIT	FIT
R	NRBC	NRBC
S	Bg	LB
T	W1	W1
U	W2	W2

Table 25: LMG Flags (Line 39)

Character	French	English
L	L1	L1
M	M1	M1
M	M2	M2
G	G1	G1
G	G2	G2
G	G3	G3

Table 26: PLT Flags (Line 40)

Character	French	English
P	PEC	SCL
S	SCH	SCH
M	MIC	MIC

4. Patient file characteristics

4.1. Key

- (|) : Carriage return $0D.

- CRC : Exclusive “OR” of all the transmitted bytes, except ETX and STX, then the inclusive “OR” with a $40 value.

- Y, Z : Alphanumeric character from $20 to $7F.

4.2. Patient file format

Table 27: Patient file format

Line	Data	Comment	Length
Line 1	STX ($02)	Start of text	1
	D ($44)	Character «D»	1
	zz]	Analyser No	2 + 1
Line 2	YYYYYYYYYYYYYY]	Identification No	16 + 1
Line 3	YYYYYYYYYYYYYYYYYYYYYYYYYYYY]	Identification	30 + 1
Line 4	zz/zz/zz]	Date of birth	8 + 1
Line 5	YYY]	Age	3 + 1
Line 6	z]	Sex	1 + 1
Line 7	Y]	From	1 + 1
Line 8	YYYYYYYYYYYYY]	Doctor	15 + 1
Line 9	YYYYYYYYY]	Department	10 + 1
Line 10	YYYYYYYYYYYY]	Sampling date	14 + 1
Line 11	YYYYYYYYYYYYYYYYYYYYYYYYYYYY]	comments	32 + 1
Line 12	CRC		1
Line 13	ETX ($03)	end of text	1
		Total:	**147**

5. End of communication

5.1. Key

- (|) : Carriage return $OD.

- CRC : Exclusive “OR” of all the transmitted bytes, except ETX and STX, then the inclusive “OR” with a $40 value.

- zz : Number of the analyser.

5.2. Line free format

Table 28: Line free format

Line	Data	Comment	Length
Line 1	STX ($02)	Start of text	1
	E ($45)	Character «E»	1
	zz]	Analyser No	2 + 1
Line 2	CRC		1
Line 3	ETX ($03)	end of text	1
		Total:	**7**