bioksel 6000

Host Communication Message Protocol

1. Low-Level Protocol (warstwa fizyczna)

1.1 Connector Pin Description (opis podłączenia złącza DB-9)

Pin	*bioksel 6000*		Pin	Host
2	RX	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<	3	TX
3	TX	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	2	RX
5	GND	> < > < > < > < > < > < > < > < > <	5	GND

1.2 Baud Rate (Prędkość transmisji)

Baud Rate	
1200	bps
2400	bps
4800	bps
9600	bps
19200	bps
38400	bps
56000	bps
57600	bps
115200	bps

1.3 Parity (Parzystość)

bioksel 6000 use only parity = „**None**"

bioksel 6000 używa tylko parzystość = "**None**"

1.4 Data Bits (Bity Danych)

Data Bits = „**8**"

1.5 Stop Bits (Bity stopu)

Stop Bits ="1"

Establishment Phase

1.6 ASTM Definition

"The Establishment Phase determines the direction of the information flow and prepares the receiver to accept information." The system which has information available initializes the establishment phase by transmitting an **<ENQ>** transmission control character to the receiver. If the receiver is ready to accept data, it shall transmit an **<ACK>** transmission control character to the sender. If unable to accept data, the receiver shall transmit a **<NAK>** transmission control character. Upon receiving a **<NAK>,** the sender must wait at least **10 seconds** before transmitting another **<ENQ>** transmission control character. If a sender receives an **<ENQ>** to its **<ENQ>,** there is contention on the line and the sender must wait as least **1 second** before transmitting another **<ENQ>.**

1.7 bioksel 6000 Advance Implementation

During the establishment phase, the *bioksel 6000* expects to receive a reply within **5 seconds (service can change this value in configuration of** *bioksel 6000* **)** after sending **<ENQ>.** If it does not receive a reply, the *bioksel 6000* enters the termination phase. The *bioksel 6000* does not accept unsolicited **<ENQ>** transmission control characters from the host system. Code page in transmission is set to **WINDOWS-1250.**

2. Transfer Phase

2.1 ASTM Definition

During the transfer phase, the sender shall transmit messages to the receiver until all messages are sent. Messages are sent in frames, each frame contains a maximum of 247 characters of which 7 characters are reserved. The frame length is the number of characters actually transferred in the frame, including the 7 reserved characters. The reserved characters are as follows:

| [0]	[1]	... text ...	[frame length-5]	[frame length-4]	[frame length-3]	[frame length-2]	[frame length-1]
<STX>	Frame number count (Modulo 8)	message record as defined below.	**<ETB>** or **<ETX>**	checksum byte 1	checksum byte 2	**<CR>**	**<LF>**

<STX> delineates the beginning of the message frame. The frame number is a **MODULO 8** (0 to 7) number which allows the receiver to know if it has received the frames in the correct sequence. Following the message text (maximum of 240 characters) are either **<ETB>,** indicating that this frame is an intermediate frame, or **<ETX>,** indicating that this is the end frame. Messages of 240 characters or less are sent in an end frame, messages with **more than 240 characters** are sent as a series of intermediate frames.

The checksum is encoded as two characters sent after the **<ETB>** or **<ETX>** character. The checksum includes the first character after **<STX>** (the frame number) up to and including **<ETB>** or **<ETX>.** It is computed by adding the binary values of the characters, keeping the least significant eight bits of the result.

The last two characters in a transmitted frame are the control characters <CR> and <LF>.

Transmisja danych – tworzenie ramek i handshake

Dane sformatowane zgodnie ze standardem ASTM 1394, zostają transmitowane do sieci (nadawane/odbierane) za pomocą niższej warstwy protokołu ASTM – 1381 (Rysunek 1).
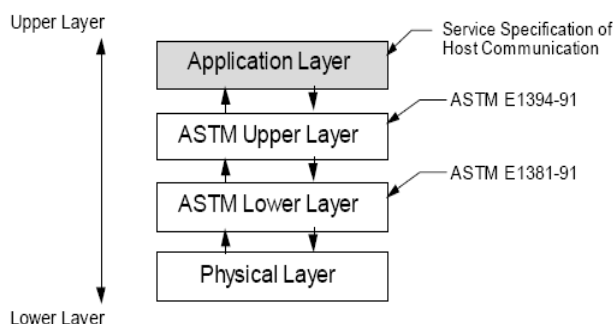
Rysunek 2: Warstwy transmisji danych

Dane (otrzymane z warstwy wyższej ASTM 1394) zostają podzielone na pakiety po maksymalnie 240 znaków. Do tak utworzonego pakietu danych zostaje dodanych 7 znaki kontrolnych. W ten sposób powstaje gotowa do wytransmitowania ramka danych.

Rysunek 1: Wygląd ramka danych: pierwszej (ETB) i ostatniej (ETX)

Zawartość ramki danych

Znak/pozycja	Opis
[STX]	<STX>(0x02) informuje o początku ramki danych
FN	Numer kolejnej ramki modulo 8. Numerowanie rozpoczyna się od 1. FN rotuje w zakresie 0..7. Reprezentowane jest za pomocą znaków ASCII (0x30..0x37)
Dane	Pakiet danych nie większy jak 240 znaków
ETB ETX	ETB (0x17) koniec bloku danych – pakiet pierwszy bądź kolejny ETX (0x03) koniec bloku danych - pakiet ostatni
CH	Starsza cześć sumy kontrolnej (most significant 4 bit) – reprezentowana ASCII
CL	Młodsza cześć sumy kontrolnej (least significant 4 bit) – reprezentowana ASCII
CR	<CR> 0x0D
LF	<LF> 0x0A

Poniżej umieszczono przykład obliczania sumy kontrolnej. Oblicza jest ona jako modulo 0x100 sumy wszystkich znaków w ramce od FN do ETX (ETB) włącznie. Reprezentacji obliczonej sumy hexadecymalnej odbywa się przez znaki ASCII [0-9, A-F] (0x30-0x39, 0x41-0x46).

```
[STX]1Test[ETX]
```

Character	Value (hex)	Sum
[STX]	02h	00h
'1'	31h	31h
'T'	+54h	85h
'e'	+65h	EAh
's'	+73h	15Dh
't'	+74h	1D1h
[ETX]	+03h	1D4h
		= 1D4h
		Mod 100h
		= **D4**h

to be sent:

```
[STX]1Test[ETX]D4[CR][LF]
```

Tak otrzymane pakiety danych mogą być wytransmitowane przez sieć.

Transmisja rozpoczyna się od wysłania przez nadawcę (Sender) komunikatu **<ENQ> (0x05).** Odbiorca (Receivr) odpowiada znakiem **<ACK> (0x06)** potwierdzając gotowość odbioru danych lub **<NAK> (0x15)** informując o nie gotowości. Jeśli Sender otrzyma **<ACK>** rozpoczyna nadawanie pierwszej ramki danych. Po jej wysłaniu Receiver potwierdza **<ACK>** poprawność przyjęcia danych. W przypadku błędu wysyła komunikat **<NAK>** i ta sama ramka zostaje przesłana ponownie. Transmisja kończy się wysłaniem ostatniej ramki z flagą **<ETX>**, odbiorca potwierdza odbiór, nadawca kończy znakiem **<EOT> (0x04)**
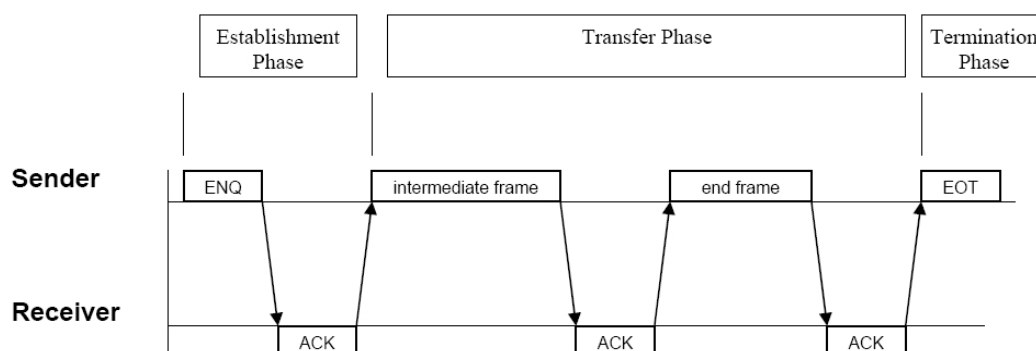
Rysunek 1: Handshake ASTM 1381

3.   Message Record Definitions
3.1   Position field and Message Definition

Level 0 Messages	Level 1 Messages	Level 2 Messages	Level 3 Messages
Header Message (H)			
	Patient Information (P) Request Information (Q)		
		Test Order Information (O)	
			Test Result Information (R)
	Comment Information (C)	Comment Information (C)	Comment Information (C)
Terminator Message (L)			

3.2   Delimiters

Each message is composed of a series of delimiters which define the message format. These delimiters are used to indicate the beginning of a field, the presence of an escape sequence, repeat fields and component fields.

Carriage return (ASCII 13) (<CR>) shall be used as the delimiter for the end of any of the defined record types.

For *bioksel* 6000 the default delimiters for uploaded messages have been defined as:

Delimiter	Character used	Meaning
Field	|	Indicates the presence of a field.
Repeat	&	Indicates that the particular field is being duplicated with additional
Component	^	Indicates that the particular field is comprised of several components, each separated by
Escape	\	Indicates that the character between the escape characters are to be handled in a special manner. Typically used when the text character to transmit is the same as one of the delimiter characters.

4.   Incoming and Outgoing Transmission Examples
4.1   Request for Test Orders

bioksel 6000 → HOST

Structure defined by ASTM 1394 (multiple records comprise a single message)		Structure defined by ASTM 1381
Level 0 Message Header Record Level 1 Request Information Record Level 0 Message Terminator Record	→	Frame 1 Frame 2 Frame 3

4.1.1   Request for Test Orders: Message Header (*bioksel 6000* →HOST)

Request for Test Orders

H|\^&|||bioksel6000|||||HOST||P|1|20021231233649
Q|1|368800150000|368800150000|||||||||O
L|1|N

Field No.	ASTM Field Name	ASTM Field Description (Message Header)	Valid Contents
1	**Record Type ID**	**This character identifies this frame as a Message Header record.**	**'H' is the only valid character.**
2	**Delimiter Definition**	**The three ASCII characters define the delimiters used throughout the subsequent record (frames) of this message. The field delimiter separates the Record Type ID from this field, the first character defines the repeat delimiter, the second character defines the component character and the third is the escape delimiter. These delimiters are then followed by another field delimiter character.**	**Default values, are:** **| \^& |** **where the field delimiter character '|' separates the other delimiter characters.**
3	Message Control ID	Unique number or other ID that identifies the transmission for use in network systems that have defined acknowledgment protocols.	Not used by *bioksel 6000*
4	Access Password	Level security/access password which has been mutually agreed upon by sender and receiver. If this check fails, the transmission shall be aborted and sender shall be notified of the access	Not used by *bioksel 6000*
5	**Sender Name (ID)**	**Defines the manufacture/instrument specific to this line. May use the repeat or component delimiter to reflect software revisions or firmware revisions or multiple instruments, etc.**	**Instrument ID when request initiated by *bioksel 6000*, Host ID when initiated by host system.** **Here analysis ID= bioksel6000**
6	Sender Street Address	Text defines the street address of sender	Not used by *bioksel 6000*
7	Reserved Field	Unused currently	Not used by *bioksel 6000*
8	Sender Telephone Number	Identifies a telephone number for voice communication.	Not used by *bioksel 6000*
9	Characteristics of Sender	Contains sender characteristics used for establishing communication link for the receiver	Not used by *bioksel 6000*
10	**Receiver ID**	**Text value includes name or other ID of the receiver. Used to verify that the transmission is for the receiver.**	**Default values, are:** **| HOST |**
11	Comment	Text field contains any comments or special instructions related to following message	Not used by *bioksel 6000*
12	**Processing ID**	**Indicates how the message is to be processed from the following definitions:** **P - Production** **T - Training** **D - Debugging** **Q - Quality Control**	**Default values, are:** **| P |**
13	**Version Number**	**Identifies the version level of the ASTM specifications**	**Currently is '1' for *ASTM 1394-91 Specification***
14	**Date and Time of Message**	**Date and Time that message was generated in following format: YYYYMMDDHHMMSS**	**'YYYYMMDDHHMMSS'**

4.1.2 Request for Test Orders: Request Information Record (*bioksel 6000* → HOST)

Field No.	ASTM Field Name	ASTM Field Description (Request Information)	Valid Contents
1	**Record Type ID**	**Character identifying the record as a request information record**	**'Q' is the character which defines the Request information record**
2	**Sequence Number**	**A sequential number indicating the number of request records in sequence, within this message packet starting at 1**	**1 to n where 1 is the first request record transferred within the packet and n is the last prior to the Termination Record (1..65535)**
3	**Starting Range ID**	**This field may contain three or more components to define a range of patients/ specimens/ manufacturers selection criteria. First component is computer system patient ID no. The second component is the computer system specimen ID. Any further components are manufacturer defined. 'ALL' implies all specimen results or all specimen orders.**	**Bar Code of patient sample = Specimen ID. This field is a maximum of 15 characters.**
4	**Ending Range ID**	**Similar to Starting Range ID. If a single specimen is requested, this may be blank.**	**Ending Range ID == Starting Range ID**
5	Universal Test ID	Universal Test ID as defined: • Test ID is the first component. It is currently unused • Test or Battery name associated with Test ID • Which coding scheme is in use • Manufacturer's test code	Not used by *bioksel 6000*
6	Request Time Limits	Specify whether time limits referenced in fields 7 and 8 refer to collected or ordered date or test date from the following flags: 'S' - specimen collect date 'R' - result test date	Not used by *bioksel 6000*
7	Beginning Request Date	Oldest date and time tests are requested. If blank go as far back as possible.	Not used by *bioksel 6000*
8	End Request Date	Latest date and time tests are requested. If blank, get most recent as possible.	Not used by *bioksel 6000*
9	Request Physicians Name	Identifies requested physician	Not used by *bioksel 6000*
10	Physicians Phone	Requesting physician's telephone number	Not used by *bioksel 6000*
11	User Field 1	User defined field	Not used by *bioksel 6000*
12	User Field 2	User defined field	Not used by *bioksel 6000*
13	**Request Information Status Codes**	**The following codes are used:** **'C' - correction of previously transmitted results** **'P' - preliminary results** **'F' - final results** **'X' - results cannot be done, request canceled** **'I' - request results pending** **'S' - request partial/unfinalized results** **'M' - result is a MIC level** **'R' - this result was previously transmitted** **'A' - abort/cancel last request criteria (allows new request to follow)** **'N' - request new/edited results only** **'O' - request test orders and demographics only** **'D' - request demographics only**	**The *bioksel 6000* only supports the following flags:** **'O' - request test orders and demographics only** **Always set to 'O'**

4.1.3 Request for Test Orders: Message Terminator

Field No.	ASTM Field Name	ASTM Field Description (Message Terminator)	Valid Contents
1	**Record Type ID**	**Character identifying the record as the last record in the message**	**'L' is the character to used to define the Termination record**
2	**Sequence Number**	**A sequential number indicating the number of terminator records in sequence, within this message packet starting at 1**	**1 to n where 1 is the first request record transferred within the packet and n is the last prior to the Termination Record**
3	**Termination Code**	**Provides explanation of the end of the session from the following flags:** **Nil or 'N' - normal termination** **'T' - sender aborted** **'R' - receiver requested abort** **'E' - unknown system error** **'Q' - error in last request for information** **'I' - no information available from last query** **'F' - last request for information processed**	**The *bioksel 6000* supports the following termination flags: 'N' - normal termination**

4.2   **Test Orders Response from HOST (Dane wysłane z HOST do *bioksel6000)***

```
H|\^&|||HOST|||||bioksel6000||P|1|20021231233650<CR>
P|1||||Kowalski Jan||19800225|M|||||||||||||||||||||||||||<CR>
O|1|368800150000||0001|R|20021231233650|||||||||||||||||||||O|||||<CR>
O|2|368800150000||0002|R|20021231233650|||||||||||||||||||||O|||||<CR>
O|3|368800150000||0003|R|20021231233650|||||||||||||||||||||O|||||<CR>
L|1|N<CR>
```

Structure defined by ASTM 1394 (multiple records comprise a single message)		Structure defined by ASTM 1381 (each record is sent as one or more frames)
Level 0 Message Header Record Level 1 Patient Information Record 1 Level 2 Test Order Record 1 Level 2 Test Order Record n Level 1 Patient Information Record n Level 2 Test Order Record 1 Level 2 Test Order Record n Level 0 Message Terminator Record	→	Frame 1 : : : : Frame n

4.2.1 Test Orders Response from HOST: Message Header

Field No.	ASTM Field Name	ASTM Field Description (Message Header)	Valid Contents
1	**Record Type ID**	**This character identifies this frame as a Message Header record.**	**'H' is the only valid character.**
2	**Delimiter Definition**	**The three ASCII characters define the delimiters used throughout the subsequent record (frames) of this message. The field delimiter separates the Record Type ID from this field, the first character defines the repeat delimiter, the second character defines the component character and the third is the escape delimiter. These delimiters are then followed by another field delimiter character.**	**Default values, are:** **l \^& l** **where the field delimiter character 'l' separates the other delimiter characters.**
3	Message Control ID	Unique number or other ID that identifies the transmission for use in network systems that have defined acknowledgment protocols.	Not used by *bioksel 6000*
4	Access Password	Level security/access password which has been mutually agreed upon by sender and receiver. If this check fails, the transmission shall be aborted and sender shall be notified of the	Not used by *bioksel 6000*
5	**Sender Name (ID)**	**Defines the manufacture/instrument specific to this line. May use the repeat or component delimiter to reflect software revisions or firmware revisions or multiple instruments, etc.**	**Instrument ID when request initiated by *bioksel 6000*, Host ID when initiated by host system.** **Here = Host ID**
6	Sender Street Address	Text defines the street address of sender	Not used by *bioksel 6000*
7	Reserved Field	Unused currently	Not used by *bioksel 6000*
8	Sender Telephone Number	Identifies a telephone number for voice communication.	Not used by *bioksel 6000*
9	Characteristics of Sender	Contains sender characteristics used for establishing communication link for the receiver	Not used by *bioksel 6000*
10	**Receiver ID**	**Text value includes name or other ID of the receiver. Used to verify that the transmission is for the receiver.**	**Must match the instrument ID name. If it does not, the message is ignored.** **Here analysis ID=' bioksel6000'**
11	Comment	Text field contains any comments or special instructions related to following message	Not used by *bioksel 6000*
12	Processing ID	Indicates how the message is to be processed from the following definitions: P - Production T - Training D - Debugging Q - Quality Control	**Default values, are:** **l P l**
13	**Version Number**	**Identifies the version level of the ASTM specifications**	**Currently is '1' for *ASTM 1394-91 Specification***
14	**Date and Time of Message**	**Date and Time that message was generated in following format: YYYYMMDDHHMMSS**	**'YYYYMMDDHHMMSS'**

4.2.2   Test Orders Response from HOST: Patient Information Record

Field No.	ASTM Field	Description (Patient Information)	Valid Contents
1	**Record Type ID**	**Character identifying the record as a patient information record**	**'P' is the only valid character**
2	**Sequence Number**	**The sequential number of the patient record starting at 1 and ending at n prior to the Termination Record for this message packet.**	**1 through n, where 1 is the first patient info record transmitted with the message packet and n is the last patient info record transmitted**
3	**Practice Assigned** Patient ID	**Unique ID assigned and used by practice to identify patient upon return** of result	**PESEL - this field is 11 characters**
4	Laboratory Assigned Patient ID	Unique processing number assigned to patient by the laboratory	Not used by *bioksel 6000*
5	Patient ID No. 3	Optionally used for additional, universal or manufacturer defined identifiers, as arranged between	Not used by *bioksel 6000*
6	**Patient Name**	**The patient's name in the following format: last name, first name, middle name or initial, suffix and title. Each component shall be separated by a component delimiter.**	**It's use by *bioksel 6000*. This field is a maximum of 32 characters.**
7	Mother's Maiden Name	Mother's maiden surname	Not used by *bioksel 6000*
8	**Birthdate**	**The birthdate as represented in the following format: YYYYMMDD**	**'YYYYMMDD' This field is 8 characters.**
9	**Patient Sex**	**The patient's sex from following: 'M' - male 'F' - female 'U' - unknown**	**'M' - Male 'F' - Female 'U' - Unknown**
10	Patient Race - Ethnic Origin	Ethnic origin of patient from following: 'W' - White 'B' - Black 'O' - Asian/Pacific Islander 'NA' - Native American 'H' - Hispanic Multiple answers are permitted if separated by component delimiter	Not used by *bioksel 6000*
11	Patient Address	Street address of the patient	Not used by *bioksel 6000*
12	Reserved Field	Reserved for future use	
13	Patient Telephone	Patient telephone number	Not used by *bioksel 6000*
14	Attending Physician ID	Identifies the physician caring for the patient as either a name or a code as agreed upon between sender/receiver. Multiple physicians are separated by repeat delimiters.	Not used by *bioksel 6000*
15	Special Field 1	Vendor use	Not used by *bioksel 6000*
16	Special Field 2	Vendor use	Not used by *bioksel 6000*
17	Patient Height	Contains patient height (default is in cms).	Not used by *bioksel 6000*
18	Patient Weight	Patient weight (default in kilos)	Not used by *bioksel 6000*
19	Diagnosis	ICD-9 code or free text describing patient diagnosis	Not used by *bioksel 6000*
20	Active Medications	Suspected medication in overdose situations.	Not used by *bioksel 6000*
21	Diet	Indicates conditions that may affect results of testing	Not used by *bioksel 6000*
22	Practice Field No. 1	Text used by practice, transmitted back with results	Not used by *bioksel 6000*

23	Practice Field No. 2	text used by practice, transmitted back with	Not used by *bioksel 6000*
24	Admission and Discharge Dates	results. Dates where discharge date follows admission data separated by repeat delimiter	
25	Admission Status	Extensions from following list plus others agreed upon between receiver/sender: 'OP' - outpatient 'PA' - pre-admit 'IP' - inpatient 'ER' - emergency room	Not used by *bioksel 6000*
26	Location	Location of clinic or nursing unit or ward or bed in terms agreed upon between sender/receiver	Not used by *bioksel 6000*
27	Nature of Alternative Diagnostic Code and Classifiers	Class of code or classifiers that are transmitted (e.g. DRG's)	Not used by *bioksel 6000*
28	Alternative Diagnostic Code and Classification	Alternative diagnostic codes	Not used by *bioksel 6000*
29	Religion	Codes for religious affiliation as agreed upon between sender/receiver	Not used by *bioksel 6000*
30	Marital Status	Marital status of patient from following: 'M' - Married 'S' – Single 'D' - Divorced 'W' - Widowed 'A' - Separated	Not used by *bioksel 6000*
31	Isolation Status	Code which indicate precautions that must be applied to protect against infection	Not used by *bioksel 6000*
32	Language	Primary language of patient	Not used by *bioksel 6000*
33	Hospital Service	Hospital service assigned to patient	Not used by *bioksel 6000*
34	Hospital Institution	Hospital institution assigned to the patient	Not used by *bioksel 6000*
35	Dosage Category	Patient dosage group	Not used by *bioksel 6000*

4.2.3 Test Orders Response from HOST: Test Order Record

Field No.	ASTM Field Name	ASTM Field Description (Test Order)	Valid Contents
1	**Record Type ID**	**Character identifying the record as a test order record**	**'O' must be used for this message record**
2	**Sequence Number**	**A sequential number indicating the number of test order records within this message packet starting at 1**	**1 to n where 1 is the first test order record transferred within the packet and n is the last prior to the Termination Record**
3	**Specimen ID**	**Unique identifier for the sample assigned by the computer system and returned by the instrument**	**Bar Code of patient sample = Specimen ID. This field is a maximum of 15 characters.**
4	Instrument Specimen ID	Unique identifier assigned by the instrument, if different then the Specimen ID and returned with results for use in referring to results	Not used by *bioksel 6000*

5	Universal Test ID	Universal Test ID as defined: • **Test ID is the first component. It is currently unused** • **Test or Battery name associated with Test ID** • **Which coding scheme is in use** • **Manufacturer's test code**	**The first three components are not supported by *bioksel 6000*.** **The Manufacturer's test code is an unique code value as defined in the Test Definition.** **This field is 4 characters.**
6	**Priority**	**Test priority codes from following:** **'S' - Stat** **'A' - As soon as possible** **'R' - Routine** **'C' - Callback** **'P' - Preoperative**	***bioksel 6000* only supports the following priority codes:** **'R' – Routine** **'A' - As soon as possible (CITO)**
7	**Requested/Ordered Date and Time**	**The date and time the test order is considered ordered. Usually it is the date/time that the order was recorded.**	**'YYYYMMDDHHMMSS'** **This field is 14 characters.**
8	Specimen Collection Date and Time	Actual time specimen was collected or obtained	Not used by *bioksel 6000*
9	Collection End Time	End date and time of a timed specimen collection	Not used by *bioksel 6000*
10	Collection Volume	Total volume of specimens	Not used by *bioksel 6000*
11	Collector ID	Identifies the person and facility which collected the specimen.	Not used by *bioksel 6000*
12	Action Code	Action to be taken with respect to the specimens from following codes: 'C' - Cancel request for tests 'A' - Add the requested test 'N' - New requests 'P' - Pending specimen 'L' - Reserved 'X' - Test already in progress 'Q' - Treat specimen as QC	Not used by *bioksel 6000*
13	Danger Code	Special hazard associated with specimen	Not used by *bioksel 6000*
14	Relevant Clinical Information	Additional information about specimen	Not used by *bioksel 6000*
15	Date/Time Specimen Received	Actual log-in time recorded in the laboratory	Not used by *bioksel 6000*
16	Specimen Descriptor (Type/Source)	May contain two separate elements: specimen type and specimen source separated by component delimiters Type and Source do not have ASTM defined values.	Not used by *bioksel 6000*
17	**Ordering Physician**	**Name of the ordering physician**	**It's use by *bioksel 6000*.** **This field is a maximum of 50 characters.**
18	Physician's Telephone	Telephone number of physician	Not used by *bioksel 6000*
19	User field 1	Text sent by requester to be returned with response	Not used by *bioksel 6000*
20	User Field 2	Text sent by requester to be returned with response	Not used by *bioksel 6000*
21 22	Laboratory Field 1 Laboratory Field 2	Definable for use by laboratory Definable for use by laboratory	Not used by *bioksel 6000*

23	Date/Time Results reported or last modified	Indicates date/time the results were last composed into a report, a message or when status is entered or changed. Information in this field may be used to control processing on the communication link.	Not used by *bioksel 6000*
24	Instrument Charges to Computer System	Billing charges or accounting reference by instrument	Not used by *bioksel 6000*
25	Instrument Section ID	Section of the instrument where the test was performed.	Not used by *bioksel 6000*
26	**Report Types**	**Codes to define report type from the following:** **'O' - Order Record: user asking analysis be performed** **'C' - Correction of previously transmitted results** **'P' - Preliminary results** **'F' - Final results** **'X' - Results cannot be done; request canceled** **'I' - pending** **'Y' - no order on record (in response to a query)** **'Z' - no record of this patient (in response to a query)** **'Q' - response to a query**	*bioksel 6000* **supports the following codes:** **'O' - Order record** **'X' - Request canceled** **'F' - Final results**
27	Reserved	Reserved for later use	Not used by *bioksel 6000*
28	Location or Ward of specimen collection	Specimen collection location if different than patient ward	Not used by *bioksel 6000*
29	Nosocomial Infection Flag	Used in epidemiological reporting purposes	Not used by *bioksel 6000*
30	Specimen Service	Individual serve applied to specimen collected	Not used by *bioksel 6000*
31	Specimen Institution	Institution name if specimen collected in one.	Not used by *bioksel 6000*

4.2.4   Test Orders Response from HOST: Message Terminator

Field No.	ASTM Field Name	ASTM Field Description (Message Terminator)	Valid Contents
1	**Record Type ID**	**Character identifying the record as the last record in the message**	**'L' is the character to used to define the Termination record**
2	**Sequence Number**	**A sequential number indicating the number of terminator records in sequence, within this message packet starting at 1**	**1 to n where 1 is the first request record transferred within the packet and n is the last prior to the Termination Record**

3	Termination Code	Provides explanation of the end of the session from the following flags: Nil or 'N' - normal termination 'T' - sender aborted 'R' - receiver requested abort 'E' - unknown system error 'Q' - error in last request for information 'I' - no information available from last query 'F' - last request for information processed	The *bioksel 6000* supports the following termination flags: 'N' - normal termination

4.3 Test Results Transmission (*bioksel 6000* → HOST)

```
H|\^&|||bioksel6000|||||HOST||P|1|20021231234137
P|1||||Kowalski Jan||19800225|M|||||||||||||||||||||||||||
O|1|368800150000||0002|R|20021231233650|||||||||||||||||||||O|||||
R|1|0002|31.8|s||||F||Administrator||20021231234136|bioksel6000
C|1||ILLEGAL CALIBRATION|
R|2|0002|0.99|||||F||Administrator||20021231234136|bioksel6000
C|1||ILLEGAL CALIBRATION|
O|2|368800150000||0003|R|20021231233650|||||||||||||||||||||O|||||
R|1|0003|62.1|s||||F||Administrator||20021231234136|bioksel6000
C|1||ILLEGAL CALIBRATION|
R|2|0003|5.17|||||F||Administrator||20021231234136|bioksel6000
C|1||ILLEGAL CALIBRATION|
O|3|368800150000||0001|R|20021231233650|||||||||||||||||||||O|||||
R|1|0001|34.4|s||||F||Administrator||20021231234137|bioksel6000
C|1||ILLEGAL CALIBRATION|
R|2|0001|38|%||||F||Administrator||20021231234137|bioksel6000
C|1||ILLEGAL CALIBRATION|
R|3|0001|2.69|||||F||Administrator||20021231234137|bioksel6000
C|1||ILLEGAL CALIBRATION|
R|4|0001|1.09|g/l||||F||Administrator||20021231234137|bioksel6000
C|1||ILLEGAL CALIBRATION|
L|1|N
```

Structure defined by ASTM 1394		Structure defined by ASTM 1394
Level 0 Message Header Record		Frame 1
Level 1 Patient Information Record 1		:
Level 2 Test Order Record 1		:
Level 3 Result Record 1		:
Level 4 Comment Record		:
:		:
Level 3 Result Record n		:
Level 2 Test Order Record 2		:
Level 3 Result Record 1		:
:		:
Level 3 Result Record n		:

Level 2	Test Order Record n		:	
Level 3	Result Record 1		:	
Level 3	Result Record n		:	
	:	→	:	
Level 1	Patient Information Record n		:	
Level 2	Test Order Record 1		:	
Level 3	Result Record 1		:	
	:		:	
Level 3	Result Record n		:	
Level 4	Comment Record		:	
Level 2	Test Order Record 2		:	
Level 3	Result Record 1		:	
	:		:	
Level 3	Result Record n		:	
Level 2	Test Order Record n		:	
Level 3	Result Record 1		:	
Level 0	Message Terminator Record		Frame n	

4.3.1 Test Results Transmission: Message Header

Field No.	ASTM Field Name	ASTM Field Description (Message Header)	Valid Contents
1	**Record Type ID**	**This character identifies this frame as a Message Header record.**	**'H' is the only valid character.**
2	**Delimiter Definition**	**The three ASCII characters define the delimiters used throughout the subsequent record (frames) of this message. The field delimiter separates the Record Type ID from this field, the first character defines the repeat delimiter, the second character defines the component character and the third is the escape delimiter. These delimiters are then followed by another field delimiter character.**	**Default values, are:** **|\\^& |** **where the field delimiter character '|' separates the other delimiter characters.**
3	Message Control ID	Unique number or other ID that identifies the transmission for use in network systems that have defined acknowledgment protocols.	Not used by *bioksel 6000*
4	Access Password	Level security/access password which has been mutually agreed upon by sender and receiver. If this check fails, the transmission shall be aborted and sender shall be notified of the	Not used by *bioksel 6000*
5	**Sender Name (ID)**	**Defines the manufacture/instrument specific to this line. May use the repeat or component delimiter to reflect software revisions or firmware revisions or multiple instruments, etc.**	**Instrument ID when request initiated by *bioksel 6000*, Host ID when initiated by host system.** **Here analysis ID= 'bioksel6000'**

6	Sender Street Address	Text defines the street address of sender	Not used by *bioksel 6000*
7	Reserved Field	Unused currently	Not used by *bioksel 6000*
8	Sender Telephone Number	Identifies a telephone number for voice communication.	Not used by *bioksel 6000*
9	Characteristics of Sender	Contains sender characteristics used for establishing communication link for the receiver	Not used by *bioksel 6000*
10	**Receiver ID**	**Text value includes name or other ID of the receiver. Used to verify that the transmission is for the receiver.**	**Must match the instrument ID name. If it does not, the message is ignored.** **Here host ID = 'HOST"**
11	Comment	Text field contains any comments or special instructions related to following message	Not used by *bioksel 6000*
12	Processing ID	Indicates how the message is to be processed from the following definitions: P - Production T - Training D - Debugging Q - Quality Control	Not used by *bioksel 6000*
13	**Version Number**	**Identifies the version level of the ASTM specifications**	**Currently is '1' for *ASTM 1394-91 Specification***
14	**Date and Time of Message**	**Date and Time that message was generated in following format: YYYYMMDDHHMMSS**	**'YYYYMMDDHHMMSS'**

4.3.2   Test Results Transmission: Patient Information Record

Field No.	ASTM Field	Description (Patient Information)	Valid Contents
1	**Record Type ID**	**Character identifying the record as a patient information record**	**'P' is the only valid character**
2	**Sequence Number**	**The sequential number of the patient record starting at 1 and ending at n prior to the Termination Record for this message packet.**	**1 through n, where 1 is the first patient info record transmitted with the message packet and n is the last patient info record transmitted**
3	**Practice Assigned Patient ID**	**Unique ID assigned and used by practice to identify patient upon return**	**PESEL - this field is 11 characters**
4	Laboratory Assigned Patient ID	Unique processing number assigned to patient by the laboratory	Not used by *bioksel 6000*
5	Patient ID No. 3	Optionally used for additional, universal or manufacturer defined identifiers, as arranged between	Not used by *bioksel 6000*
6	**Patient Name**	**The patient's name in the following format: last name, first name, middle name or initial, suffix and title. Each component shall be separated by a component delimiter.**	**It's use by *bioksel 6000*.** **This field is a maximum of 32 characters.**
7	Mother's Maiden Name	Mother's maiden surname	Not used by *bioksel 6000*
8	**Birthdate**	**The birthdate as represented in the following format: YYYYMMDD**	**'YYYYMMDD'** **This field is 8 characters.**
9	**Patient Sex**	**The patient's sex from following:** **'M' - male** **'F' - female** **'U' - unknown**	**'M' - Male** **'F' - Female** **'U' - Unknown**

10	Patient Race - Ethnic Origin	Ethnic origin of patient from following: W' - White 'B' - Black 'O' - Asian/Pacific Islander 'NA' - Native American 'H' - Hispanic Multiple answers are permitted if separated by component delimiter	Not used by *bioksel 6000*
11	Patient Address	Street address of the patient	Not used by *bioksel 6000*
12	Reserved Field	Reserved for future use	
13	Patient Telephone	Patient telephone number	Not used by *bioksel 6000*
14	Attending Physician ID	Identifies the physician caring for the patient as either a name or a code as agreed upon between sender/receiver. Multiple physicians are separated by repeat delimiters.	Not used by *bioksel 6000*
15	Special Field 1	Vendor use	Not used by *bioksel 6000*
16	Special Field 2	Vendor use	Not used by *bioksel 6000*
17	Patient Height	Contains patient height (default is in cms).	Not used by *bioksel 6000*
18	Patient Weight	Patient weight (default in kilos)	Not used by *bioksel 6000*
19	Diagnosis	ICD-9 code or free text describing patient diagnosis	Not used by *bioksel 6000*
20	Active Medications	Suspected medication in overdose situations.	Not used by *bioksel 6000*
21	Diet	Indicates conditions that may affect results of testing	Not used by *bioksel 6000*
22	Practice Field No. 1	Text used by practice, transmitted back with results	Not used by *bioksel 6000*
23 24	Practice Field No. 2 Admission and Discharge Dates	text used by practice, transmitted back with results. Dates where discharge date follows admission data separated by repeat delimiter	Not used by *bioksel 6000*
25	Admission Status	Extensions from following list plus others agreed upon between receiver/sender: 'OP' - outpatient 'PA' - pre-admit 'IP' - inpatient 'ER' - emergency room	Not used by *bioksel 6000*
26	Location	Location of clinic or nursing unit or ward or bed in terms agreed upon between sender/receiver	Not used by *bioksel 6000*
27	Nature of Alternative Diagnostic Code and Classifiers	Class of code or classifiers that are transmitted (e.g. DRG's)	Not used by *bioksel 6000*
28	Alternative Diagnostic Code and Classification	Alternative diagnostic codes	Not used by *bioksel 6000*
29	Religion	Codes for religious affiliation as agreed upon between sender/receiver	Not used by *bioksel 6000*
30	Marital Status	Marital status of patient from following: 'M' - Married 'S' – Single 'D' - Divorced 'W' - Widowed 'A' - Separated	Not used by *bioksel 6000*
31	Isolation Status	Code which indicate precautions that must be applied to protect against infection	Not used by *bioksel 6000*
32	Language	Primary language of patient	Not used by *bioksel 6000*
33	Hospital Service	Hospital service assigned to patient	Not used by *bioksel 6000*
34	Hospital Institution	Hospital institution assigned to the patient	Not used by *bioksel 6000*
35	Dosage Category	Patient dosage group	Not used by *bioksel 6000*

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4.3.3 Test Results Transmission: Test Order Record

Field No.	ASTM Field Name	ASTM Field Description (Test Order)	Valid Contents
1	**Record Type ID**	**Character identifying the record as a test order record**	**'O' must be used for this message record**
2	**Sequence Number**	**A sequential number indicating the number of test order records within this message packet starting at 1**	**1 to n where 1 is the first test order record transferred within the packet and n is the last prior to the Termination Record**
3	**Specimen ID**	**Unique identifier for the sample assigned by the computer system and returned by the instrument**	**Bar Code of patient sample = Specimen ID. This field is a maximum of 15 characters.**
4	Instrument Specimen ID	Unique identifier assigned by the instrument, if different then the Specimen ID and returned with results for use in referring to results	Not used by *bioksel 6000*
5	**Universal Test ID**	**Universal Test ID as defined:** • **Test ID is the first component. It is currently unused** • **Test or Battery name associated with Test ID** • **Which coding scheme is in use** • **Manufacturer's test code**	**The first three components are not supported by *bioksel 6000*. The Manufacturer's test code is an unique code value as defined in the Test Definition. This field is 4 characters.**
6	**Priority**	**Test priority codes from following:** **'S' - Stat** **'A' - As soon as possible** **'R' - Routine** **'C' - Callback** **'P' - Preoperative**	***bioksel 6000* only supports the following priority codes:** **'R' – Routine** **'A' - As soon as possible**
7	**Requested/Ordered Date and Time**	**The date and time the test order is considered ordered. Usually it is the date/time that the order was recorded.**	**'YYYYMMDDHHMMSS' This field is 14 characters.**
8	Specimen Collection Date and Time	Actual time specimen was collected or obtained	Not used by *bioksel 6000*
9	Collection End Time	End date and time of a timed specimen collection	Not used by *bioksel 6000*
10	Collection Volume	Total volume of specimens	Not used by *bioksel 6000*
11	Collector ID	Identifies the person and facility which collected the specimen.	Not used by *bioksel 6000*
12	Action Code	Action to be taken with respect to the specimens from following codes: 'C' - Cancel request for tests 'A' - Add the requested test 'N' - New requests 'P' - Pending specimen 'L' - Reserved 'X' - Test already in progress 'Q' - Treat specimen as QC	Not used by *bioksel 6000*
13	Danger Code	Special hazard associated with specimen	Not used by *bioksel 6000*

14	Relevant Clinical Information	Additional information about specimen	Not used by *bioksel 6000*
15	Date/Time Specimen Received	Actual log-in time recorded in the laboratory	Not used by *bioksel 6000*
16	Specimen Descriptor (Type/Source)	May contain two separate elements: specimen type and specimen source separated by component delimiters Type and Source do not have ASTM defined values.	Not used by *bioksel 6000*
17	**Ordering Physician**	**Name of the ordering physician**	**It's use by *bioksel 6000*.** **This field is a maximum of 50 characters.**
18	Physician's Telephone	Telephone number of physician	Not used by *bioksel 6000*
19	User field 1	Text sent by requester to be returned with response	Not used by *bioksel 6000*
20	User Field 2	Text sent by requester to be returned with response	Not used by *bioksel 6000*
21 22	Laboratory Field 1 Laboratory Field 2	Definable for use by laboratory Definable for use by laboratory	Not used by *bioksel 6000*
23	Date/Time Results reported or last modified	Indicates date/time the results were last composed into a report, a message or when status is entered or changed. Information in this field may be used to control processing on the communication link.	Not used by *bioksel 6000*
24	Instrument Charges to Computer System	Billing charges or accounting reference by instrument	Not used by *bioksel 6000*
25	Instrument Section ID	Section of the instrument where the test was performed.	Not used by *bioksel 6000*
26	**Report Types**	**Codes to define report type from the following:** **'O' - Order Record: user asking analysis be performed** **'C' - Correction of previously transmitted results** **'P' - Preliminary results** **'F' - Final results** **'X' - Results cannot be done; request canceled** **'I' - pending** **'Y' - no order on record (in response to a query)** **'Z' - no record of this patient (in response to a query)** **'Q' - response to a query**	***bioksel 6000* supports the following codes:** **'O' - Order record** **'X' - Request canceled** **'F' - Final results**
27	Reserved	Reserved for later use	Not used by *bioksel 6000*
28	Location or Ward of specimen collection	Specimen collection location if different than patient ward	Not used by *bioksel 6000*
29	Nosocomial Infection Flag	Used in epidemiological reporting purposes	Not used by *bioksel 6000*
30	Specimen Service	Individual serve applied to specimen collected	Not used by *bioksel 6000*
31	Specimen Institution	Institution name if specimen collected in one.	Not used by *bioksel 6000*

4.3.4   Test Results Transmission: Result record

Field No.	ASTM Field Name	ASTM Field Description (Result)	Valid Contents
1	**Record Type ID**	**Character identifying the record as a result record**	**'R' is used to indicate the Result Record**
2	**Sequence Number**	**A sequential number indicating the number of result records within this message packet starting at 1**	**1 to n where 1 is the first results record transferred within the packet and n is the last prior to the Termination Record**
3	**Universal Test ID**	**Universal Test ID as defined:** • **Test ID is the first component. It is currently unused** • **Test or Battery name associated with Test ID** • **Which coding scheme is in use** • **Manufacturer's test code**	**The first three components are not supported by *bioksel 6000*. The Manufacturer's test code is an unique code value as defined in the Test Definition.** **This field is 4 characters.**
4	**Data or Measurement Value**	**The result data in ASCII text notation. Multiple result values must be reported in separate result records with each result definition defined uniquely by the test ID field (Universal Test ID).**	***bioksel 6000* will transmit a result value if a result was calculated, or an empty field if the result failed. This field is a maximum of 12 characters.**
5	**Units**	**Abbreviation of units for numerical results using ISO2955 standards when available**	**Units as defined for the *bioksel 6000* tests. This field is a maximum of 5 characters.**
6	Reference Ranges	The range in the format: '3.5 to 4.5' and may include a text description of the range, separated by the component delimiter. If multiple ranges are sent, they are separated by repeat delimiters.	Not used by *bioksel 6000*
7	**Result Abnormal Flags**	**Indicates the normalcy status of the result. The flags are from the following:** **'L' - below low normal** **'H' - above high normal** **'LL' - below panic normal** **'HH' - above panic normal** **'<' - below absolute low (off scale)** **'>' - above absolute high (off scale)** **'N' - normal** **'U' - significant change up** **'D' - significant change down** **'B' - better** **'W' - worse**	**The *bioksel 6000* implements the following flags:** **'L' - sample is below low normal or below low test range** **'H' - sample is above high normal or above high test range** **'N' - sample is within normal and test range** **'<' - below absolute low (off scale or no reaction)** **'>' - above absolute high (off scale or no clot)**
8	Nature of Abnormality Testing	The kind of normal testing performed from the following flags: 'A' - age based population 'S' - sex based population 'R' - race based population 'N' - generic normal range was applied	Not used by *bioksel 6000*
9	**Result Status**	**The status of the result from the following flags:** **'C' - correction of previously transmitted result** **'P' - preliminary result** **'F' - final result** **'X' - results cannot be done, request not honored** **'I' - result pending** **'S' - partial results** **'M' - this result is a MIC level** **'R' - this result was previously transmitted** **'N' - the result record contains necessary information to run a new order** **'Q' - this result is a response to an outstanding query** **'V' - operator verified/approved result**	**The *bioksel 6000* supports the following result status flags:** **'F' - final result**

10	Date of Change in Instrument Normative Values or Units	Date and Time in format YYYYMMDDHHMMSS of changes in normal values or units previously recorded	Not used by *bioksel 6000*
11	**Operator ID**	**Instrument operator identification.**	***bioksel 6000* transmitting the ID (name) of the operator who ran the test. This field is a maximum of 32 characters.**
12	Date/Time Test Started	Date and time in format YYYYMMDDHHMMSS of the date and time instrument started the test results being reported	Not used by *bioksel 6000*
13	**Date/Time Test Completed**	**Date and time in format: 'YYYYMMDDHHMMSS' of the data and time the instrument complete the test results being reported**	**'YYYYMMDDHHMMSS' This field is 14 characters.**
14	**Instrument ID**	**Identifies instrument that performed the particular measurement**	**The instrument ID: 'bioksel6000'**

4.3.5   Test Results Transmission: Comment Record

Field No.	ASTM Field Name	ASTM Field Description (Comment)	Valid Contents
1	**Record Type ID**	**Character identifying the record as a comment record**	**'C' is the character which defines the comment record**
2	**Sequence Number**	**A sequential number indicating the number of comment records in a sequence within this message packet starting at 1**	**1 to n where 1 is the first comment record transferred within the packet and n is the last prior to the Termination Record**
3	Comment Source	Comment origination point from the following: 'P' - practice 'L' - computer system 'I' - clinical instrument system	Not used by *bioksel 6000*
4	**Comment Text**	**Comment Code followed by the comment text.**	***bioksel 6000* comments: 'NO ERRORS' 'ORDER ADDED BY USER' 'ORDER CANCELED BY USER' 'PROGRAM UNDEFINED' 'ILLEGAL CALIBRATION' 'NO PLASMA' 'DENSE PLASMA' 'NO CLOT' 'NO REACTION'**
5	Comment Type	Qualifies the comment record type from the following flags: 'G' - generic/free text comment 'T' - test name comment 'P' - positive test comment 'N' - negative test comment 'I' - instrument flag(s) comment	Not used by *bioksel 6000*

4.3.6　Test Results Transmission: Message Terminator

Field No.	ASTM Field Name	ASTM Field Description (Message Terminator)	Valid Contents
1	**Record Type ID**	**Character identifying the record as the last record in the message**	**'L' is the character to used to define the Termination record**
2	**Sequence Number**	**A sequential number indicating the number of terminator records in sequence, within this message packet starting at 1**	**1 to n where 1 is the first request record transferred within the packet and n is the last prior to the Termination Record**
3	**Termination Code**	**Provides explanation of the end of the session from the following flags:** **Nil or 'N' - normal termination** **'T' - sender aborted** **'R' - receiver requested abort** **'E' - unknown system error** **'Q' - error in last request for information 'I' - no information available from last query** **'F' - last request for information processed**	**The *bioksel 6000* supports the following termination flags: 'N' - normal termination**

5 Universal Test ID. Tests definition:

Types of programs	Universal Test ID	Units
"PT ",	**0001**	Time – "s" index PT – "%" INR – "" Fibrinogen PT – "g/l"
"APTT ",	**0002**	Time – "s" Ratio – ""
"TT ",	**0003**	Time – "s" Ratio – ""
"FIBR. ",	**0004**	Fibrinogen – "g/l"
"CZ. II ",	**0005**	Factor II – "%"
"CZ. V ",	**0006**	Factor V – "%"
"CZ. VII ",	**0007**	Factor VII – "%"
"CZ. VIII",	**0008**	Factor VIII – "%"
"CZ. IX ",	**0009**	Factor IX – "%"
"CZ. X ",	**0010**	Factor X – "%"
"CZ. XI ",	**0011**	Factor XI – "%"
"CZ. XII ",	**0012**	Factor XII – "%"
"ATIII ",	**0013**	AT III – „%"
"D-IMERY",	**0014**	D-Dimery – „ug/l"
"a2-AP ",	**0015**	a2-AP – „%"
"BIAŁKO C",	**0016**	Protein C – „%"
"PLAZMIN.",	**0017**	Plazminogen – „%"