CS-2000i/CS-2100i ASTM
Host Interface Specification

Rev. 2.10

Sysmex Corporation

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1. General

This document is intended to supply the information that the CS-2000i/CS-2100i Automated Blood Coagulation Analyzer communicates with the host computer using ASTM protocol.

2. Scope

This document describes the Data Communication Specifications for CS-2000i/CS-2100i using ASTM "E1394-97 and E-1381-02" and "ASTM E1394-95 and ASTM E1381-95"

ASTM (the American Society for Testing and Materials), one of the world largest volunteer non-profit organization, founded in 1898 for the purpose of creating standard regulations for material, products and system services. This specification conforms to the following two standards:

・Specifications for low level protocols to transfer data between clinical laboratory instruments and computer systems.
ASTM E1381-02
ASTM E1381-95

In ASTM E1381-95, it is possible to communicate with the host computer conforming to ASTM E1381-91.

・Standard specifications for transferring data between clinical instruments and computer systems.
ASTM E1394-97
ASTM E1394-95

In ASTM E1394-95, it is possible to communicate with the host computer conforming to ASTM E1394-91.

3. Revision History

Revision	Date	Major Contents of Changes
1.00	March 30, 2007	Initial Version
1.10	May 31, 2007	Regarding 8.1.6 "Patient record", "Not used" is changed to "^First name ^Last name ".
1.20	August 29, 2007	When the Barcode Reading Error occurs, the assigned sample No. is changed to 13-digit or 15-digit beginning with "□□ERR0000000001" or "ERR000000000001" respectively. It is added that Sample No. in Barcode Reading Error is selectable from 13-digit or 15-digit in the System Settings screen.
1.30	November 13, 2007	It is added that the redilution, re-analysis and reflex test are performed according to the instrument setting even if the host computer specifies the analysis at the dilution ratio different from the instrument setting.
1.40	June 26, 2009	The case where HIL flags are output is added to the result record. Descriptions about E1381-91 and E1394-91 are added.
1.50	December 9, 2009	The case where Sample Info. flag are output is added to the result record. Test Codes are added.
1.60	April 7, 2010	Parameter Codes are added.(vWF-RCo medium, vWF-RCo low, vWF-Ag medium, vWF-Ag low) Reserve codes in the Parameter Code List are added. The Parameter Code Lists are collected up to Chapter 7. The Parameter Code Lists.
1.70	August 24, 2010	Parameter Codes List is renewal. Baud Rate is corrected.
1.80	December 21, 2010	7. P-FDP is added into the Parameter Codes List. 5.3.1.2. The description of comment is deleted. 5.3.3.2. The description of Patient ID No., Birth date, Patient sex, Attending physician name and Location are deleted.
1.90	March 27,2012	5.3.1.2 Record The description of Output of [CR] is based on IPU Settings is added. 5.3.3.1 Header Recor The description of Output of softwar version is based on IPU is added. 5.3.3.5 Result record the description of Output of Sample Volume flags is based on IPU is added.
2.00	March 25, 2014	5.3.3.5 Result record the description of Evaluation Information and Instrument Error Information is added.
2.10	March 31, 2015	5.3.3.4 - 3) Rack No. and Tube Position of Test Order Record in case of the integrated result of platelet aggregation analysis are added. Caution is added on Table 14 about the analysis error which the masked value are output when “The data is not output when the coagulation curve error is found” is turned ON. Correct some erroneous descriptions in Table 14. Parameter Codes of platelet aggregation analysis are added in Table 16. “Appendix B. Difference List of Transmission Content” is added.

4. Terminology

The definition of the terminology used in this document is described in the following.

Numerics:
Indicates ASCII codes “0” (30h) through “9” (39h)

Alphabet:
Indicates ASCII codes “A” (41h) through “Z” (5Ah) and “a” (61h) through “z” (7Ah)

Alpha-numeric:
Indicates numerical or alphabetical character

5. Communication Specifications

Communication specifications are based on a layer protocol.

(1) Physical Layer

Specifies the sending and receiving of signals between the IPU and the host computer through physical and electrical connections

See the section "4.1 Physical Layer (Hardware)"

(2) Data link layer

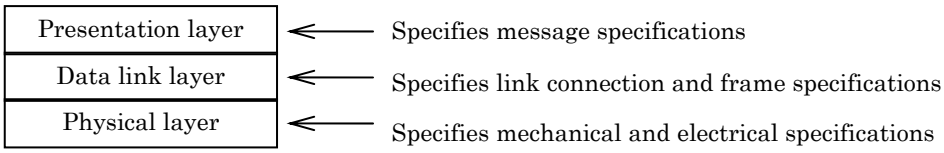
Specifies the sending and receiving of data by link connections and for each frame between the IPU and the host computer

See the section "4.2 Data Link Layer (Transmission Protocol)"

(3) Presentation layer

Specifies the messages that are sent and received by the IPU and the host computer

See the section "4.3 Presentation Layer"



Notes
The information processing Unit (IPU) of the CS-2000i/CS-2100i supports connection by the Ethernet and RS-232C.
From the combinations between the specifications conforming to two standards and connection types, CS-2000i/CS-2100i supports the following three modes.

1. TCP/IP connection
The presentation layer conforms to ASTM E1394-97.
The data link layer conforms to ASTM E1381-02.
The physical layer conforms to IEEE802.3. (*1)

2.ASTM E1381-02 mode (serial interface)
The presentation layer conforms to ASTM E1394-97 mode.
The data link layer and the physical layer conform to ASTM E1381-02.

3.ASTM E1381-95 mode (serial interface)
The presentation layer conforms to ASTM E1394-95.
The data link layer and the physical layer conform to ASTM E1394-95.

	Ethernet connection	Serial connection	
		ASTM E1381-02 mode	ASTM E1381-95 mode
Presentation layer	ASTM E1394-97	ASTM E1394-97	ASTM E1394-95
Data link layer	ASTM E1381-02	ASTM E1381-02	ASTM E1381-95
Physical layer *1	IEEE802.3	ASTM E1381-02	ASTM E1381-95

*1: The IEEE802.3 specifications in the physical layer are not described in this document.

5.1. Physical Layer (Hardware)

5.1.1. Serial Connection

5.1.1.1. Connectors

Although the ASTM standard specifies a DB-25-pin male connector as standard, a DB-9-pin-male I/O connector, which is located on the rear of IPU, is used to communicate.

Table 1: Connector pin assignment

Pin No.	Signal name		Signal direction
1		NC	
2	Receive data	RxD	To IPU from host
3	Transmit data	TxD	From IPU to host
4	Data terminal ready	DTR	From IPU to host
5	Signal ground	SG	―
6	Data set ready	DSR	To IPU from host
7	Request to send	RTS	From IPU to host
8	Clear to send	CTS	To IPU from host
9		NC	

The control signals are not used with ASTM specifications.
For this reason, do not make connections to unused pins.

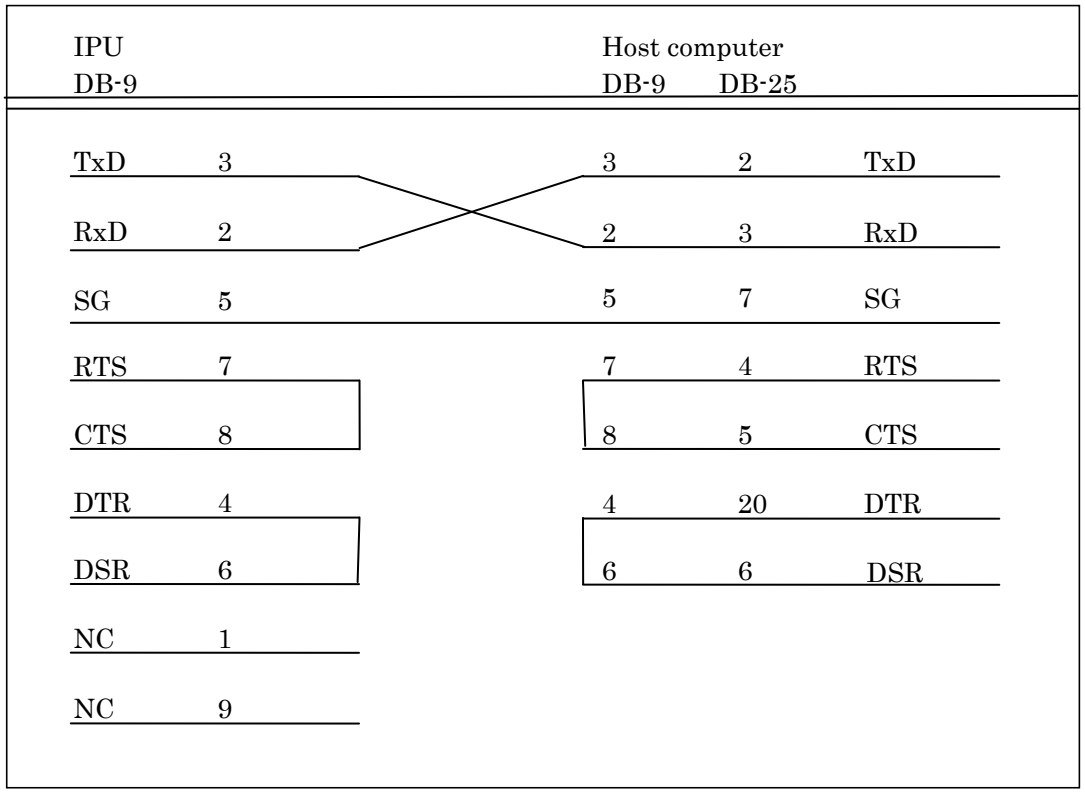
5.1.1.2. Signal identification level

Table 2: Signal identification level

Level	Data signal	Control signal
+3V or more	Logic ”0”, start bit	ON
-3V or less	Logic ”1”, stop bit	OFF

5.1.1.3. Connection cable

Please configure a cable with a D-SUB 9pin female adaptor for connecting to the instrument's D-SUB 9 male connector in accordance with the following connection chart.



5.1.1.4. Interface parameters

Table 3: Interface parameters

Parameter	Selection of settings
Baud rate	300, 2400, 4800, *9600, 19200 (bps)
Data length	7bits , 8bits*
Stop bit	1bits* , 2bits
Parity	None* , Even , Odd

The value with asterisk mark (*) allows conformance with the ASTM standard.
[Note] However, 7-bit data lengths, even or odd parity and two stop bits are recognized by the ASTM standard for use with special applications.

5.1.1.5. Standard specifications（ASTM E1381-02）

The physical layer of the IPU conforms to ASTM E1381-02 “5. Physical Layer", except for the connector type.
The IPU uses a D-SUB-9 pin male connector. (The ASTM standard specifies a 25-pin male connector.)

5.1.2. Ethernet Connection

Ethernet connection conforms to IEEE802.3. The communication cable uses the UTP category 5 cable. Prepare the connector and cable which apply to the Ethernet connector of the IPU.

5.2. Data Link Layer (Transmission Protocol)

The data link layer transfers data between systems using a character-based protocol in accordance with ASTM E 1381-02 “6. Data Link layer”.
This section briefly describes communication control procedures. For details, refer to ASTM E1381-02.
When the TCP/IP connection is intended to use, the TCP connection is established in prior to the communication. To establish the TCP connection, the host computer acts as a server and the IPU acts as a client. The IPU establishes a connection by requesting a connection for the IP address and the port number that are provided by the host computer.

5.2.1. Communication status

The data link layer is consisted of following two states.

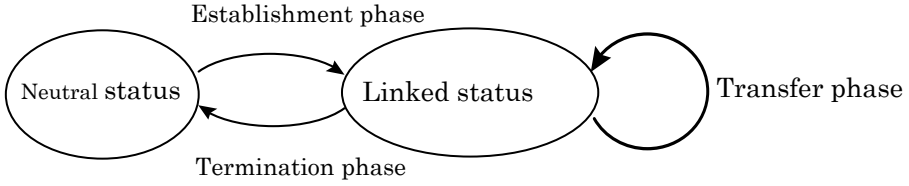
- Neutral Status
- Linked status

Transition to each status is accomplished through the following three phases.

(1) Establishment phase
Establishes communication line, and determines the direction of data transfer. In this way, the sender and the receiver are identified, and the change is made from neutral status to linked status.

(2) Transfer phase
The sender transmits messages to the receiver until all messages are transferred.

(3) Termination phase
Releases the communication line. Changes both the sender and the receiver from linked status to neutral status.

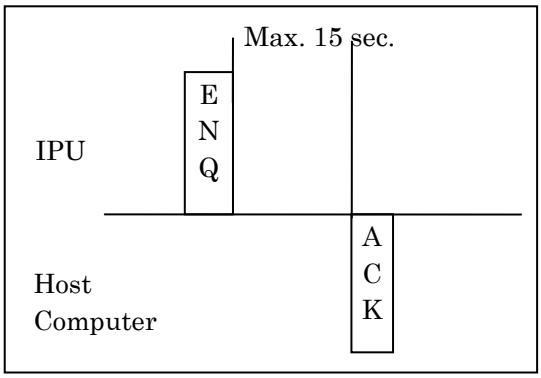


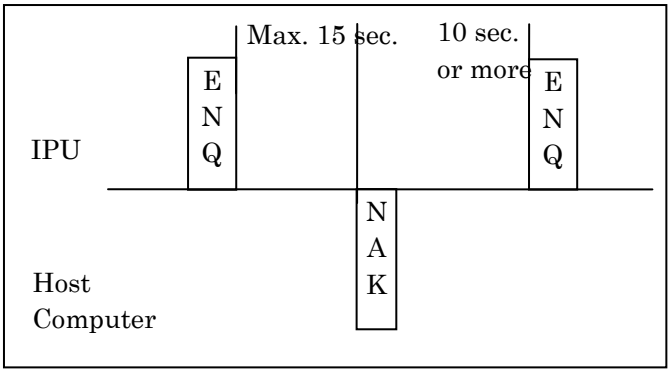
5.2.2. Establishment phase

(1) The sender (IPU) sends an [ENQ] signal to the receiver (host computer). To respond to the sender, the receiver performs the following action.

- Returns an [ACK] signal when the communication is enabled.
- Returns a [NAK] when the communication is disabled.

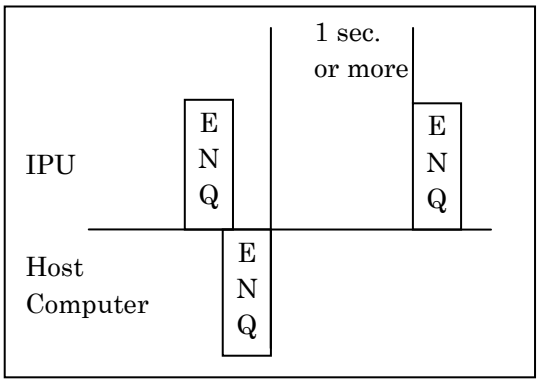
If the receiver responded [NAK], the sender waits for at least 10 seconds before attempting to send another [ENQ] signal.

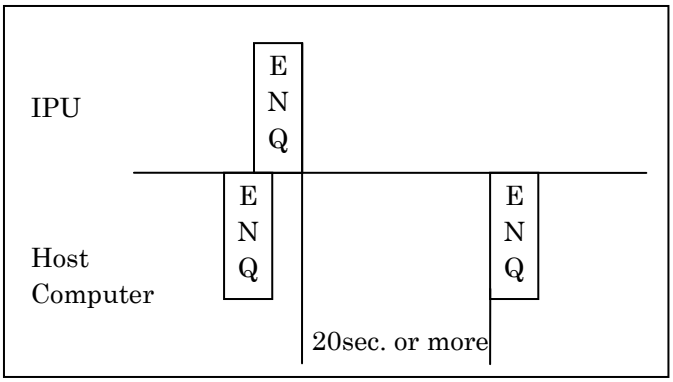




(2) When both the sender and receiver send [ENQ] signals, the host computer must yield control authority to the IPU.

- The IPU sends [ENQ] again after 1 second.
- The host computer must wait for 20 seconds before sending [ENQ] again.





5.2.3. Transfer phase

During the transfer phase, the sender sends messages to the receiver. The transfer phase continues until all messages have been sent.

(1) Messages are sent in each record with multiple frames. Each frame contains a maximum of 64,000 characters (including frame overhead) in the ASTM E1381-02 mode. If the record is longer than 63,993 characters, it is divided into two or more frames. The maximum number of characters in each record is set to 240 characters in the ASTM E1381-95 mode.

(2) Multiple records cannot be included in a single frame.

(3) If the record contains the maximum number of characters or less, a frame with the following structure will be transferred.

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

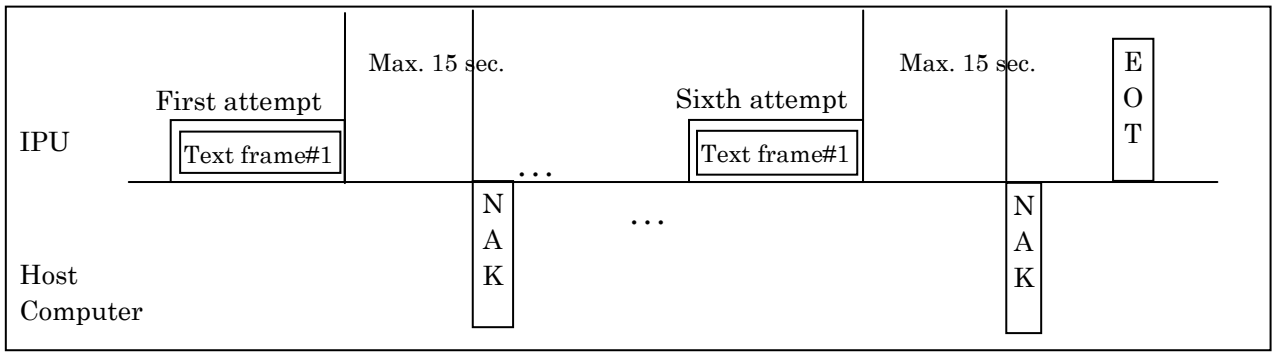
If the record is longer than the maximum number of characters, it is divided into two or more frames. The intermediate frame text termination code is [ETB], and the final frame text termination code is [ETX], as shown below.

[STX] [F#] [Text] [ETB] [CHK1] [CHK2] [CR] [LF]
[STX] [F#] [Text] [ETB] [CHK1] [CHK2] [CR] [LF]
……
[STX] [F#] [Text] [ETX] [CHK1] [CHK2] [CR] [LF]

Symbol	Explanation
[STX]	Start of a frame
[F#]	Frame number One of the numbers 0 to 7 is used, beginning with 1 and repeating 2,3,4,5,6,7,0. In case of retransmission, the same frame number is sent.
[Text]	ASTM E1394-97 records are used. (See the subsequent section “4.3 Presentation Layer”.) For this reason, the codes below will not be used. 0x00-0x06,0x08,0x0A,0x0E-0x1F,0x7F,0xFF
[ETB]	Control code indicating end of text (for intermediate frame)
[ETX]	Control code indicating end of text (for the final frame)
[CHK1] [CHK2]	Expressed by characters “0” - “9” and “A” - “F”. Characters beginning from the character following [STX] and until [ETB] or [ETX] (including [ETB] or [ETX]) are added in binary. The 2-digit numbers, which represent the least significant 8 bits in hexadecimal code, are converted to ASCII characters “0” - “9” and “A” - “F”. The most significant digit is stored in CHK1 and the least significant digit in CHK2.
[CR] [LF]	Control code indicating end of frame

(4) If the receiver has successfully received the frame, and is prepared to receive the next frame, the receiver responds with [ACK]. After the sender receives [ACK], the sender advances the frame number and either sends a new frame or transition to the termination phase.

(5) If the receiver fails to receive the frame and is prepared to receive the same frame again, the receiver responds with [NAK]. After the sender receives [NAK], the sender sends the most recent frame again, using the same frame number. If a total of 6 attempts to send the frame failed, the sender transitions to the termination phase and must end sending of the message.



(6) The IPU processes the response of [EOT] from the Host computer as [ACK]. (Response of [EOT] from the receiver is usually a request to suspend a transmission to the sender. However, the IPU does not support this function.)

5.2.4. Termination phase

During the termination phase, the status returns to neutral.
The sender sends the [EOT] to inform the receiver that the message transmission has been completed. When the sender sends [EOT], the sender transitions to neutral status. When the receiver receives [EOT], the receiver transitions to neutral status.

5.2.5. Time out

The timer is used to detect a failure to coordinate between the sender and the receiver. The timer is used as a mean of the recovery for communication line and communication destination device failure.

(1) During the establishment phase, the timer is set when the sender sends [ENQ]. The time out results if a response of [ACK], [NAK] or [ENQ] is not received within 15 seconds. After time out, the sender transitions to the termination phase.

(2) During transfer phase, the 15-second timer is set when the sender sends the final character of a frame. Time out results if no response is received within 15 seconds. After time out, the sender transitions to the termination phase.
The receiver sets a 30-second timer when first entering the transfer phase or when responding (either [ACK] or [NAK]) to a frame. Time out results if the receiver does not receive a frame or [EOT] from the sender within 30 seconds. After time out, the receiver discards the latest incomplete message and transitions to the termination phase.

5.3. Presentation Layer

5.3.1. Messages, Record and Field

5.3.1.1.Messages

In the presentation layer, all data is transmitted using messages. Messages are composed of record arrays that start with message header record (H) and end with message termination record (L).

5.3.1.2.Records

A record is a series of text, beginning with an ASCII alphabet characters referred to as the identifier, and ending with [CR].
When [CR] is added to end of the record, [System Stteings]-[Host Computer]-[Format ASTM]-[Detailed setting]-[Add a [CR] at the end of a record] turn ON on the IPU.
If this set value is OFF, [CR] is not sent from IFU.

Table 4: Records

Record Type	Record identifier	Level	Contents
Header Record	H	0	Contains the sender and the receiver information.
Patient information Record	P	1	Contains the patient information
Inquiry record	Q	1	Requires test order information requesting to the host computer
Test Order Record	O	2	Contains test order information
Test Result Record	R	3	Contains test result information
Comment Record	C	1－4	Not used.
Manufacturer Information Record	M	1－4	Not used
Scientific Information Record	S	N/A	Not used
Message Terminator Record	L	0	Indicates the end of the message

- A smaller level number indicates a higher level.
- A higher-level record contains information that is common to all lower-level records.

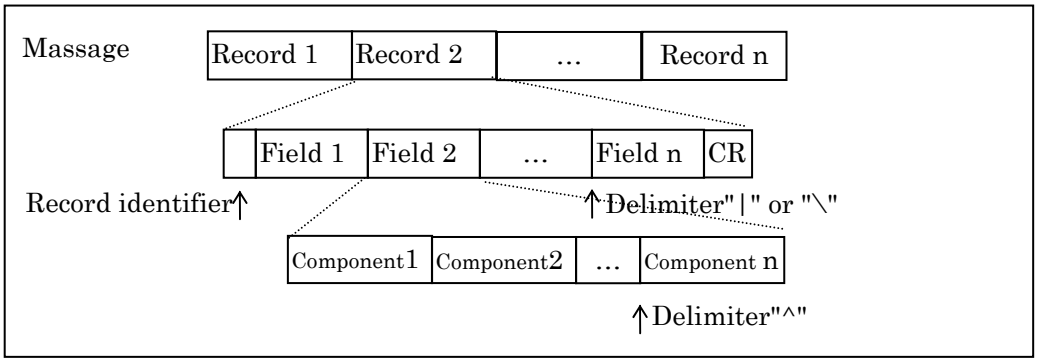
- All levels other than 0 must be located after higher levels.
- Example transmission
  H->P->O->R->L… Correct
  H->R->L…… Incorrect, because P and O must be transmitted in prior to R

5.3.1.3.Field

A record is further divided into multiple fields by field delimiters.
A field is identified by its position within a record and has a variable length. The following is used as delimiters.

Table 5: Fields

Type	Code	Description
Field delimiter	Vertical bar (|)(7Ch)	Separates adjacent field within a record
Repeat delimiter	Back slash (\) (5Ch)	Separates multiple numbers of descriptors in a field.
Component delimiter	Caret ^ (5Eh)	Separates data elements within a field that has a hierarchical or qualifier nature.
Escape delimiter	Ampersand &(26H)	Is used within a text field to identify special case operations.



5.3.2. Communication Protocol

5.3.2.1.Analysis Order inquiry (IPU-> Host computer)

This protocol is used for CS-2000i/CS-2100i to inquire to the host computer analysis information to obtain the sample information.
Inquiry can be made with keyword of the sample ID Number in CS-2000i/CS-2100i.

Table 6: Analysis Order Inquiry

IPU	Direction	Host computer
ENQ	→	
	←	ACK
H (Header Record)	→	
	←	ACK
Q (Inquiry Record)	→	
	←	ACK
L (Message Terminator Record)	→	
	←	ACK
EOT	→	

5.3.2.2.Analysis information (Host computer -> IPU)

This protocol is used for the host computer to respond analysis information against the inquiry made by the IPU.

Table 7 : Analysis Information

IPU	Direction	Host computer
	←	ENQ
ACK	→	
	←	H (Header Record)
ACK	→	
	←	P (Patient Record)
ACK	→	
	←	O (Test Order Record)
ACK	→	
	←	L (Message Terminator Record)
ACK	→	
	←	EOT

5.3.2.3. Analysis Results & QC Data (IPU-> Host computer)

This protocol is used for the IPU to transmit the analysis result, the QC data in a real-time transmission (QC sample Number is "QCXX" and transmitted as similar to the regular sample data), and the QC data in the manual output.

Table 8 : Analysis results and QC data

IPU	Direction	Host computer
ENQ	→	
	←	ACK
H (Header Record)	→	
	←	ACK
P (Patient Record)	→	
	←	ACK
O (Test Order Record)	→	
	←	ACK
R : Result Record (Replicating the No. of parameters)	→	
(Replicating the No. of parameters)	←	ACK (Replicating the No. of receiving parameters)
L (Message Terminator Record)	→	
	←	ACK
EOT	→	

5.3.3. Details of Record

5.3.3.1.Header Record

[Example of transmission]

- IPU -> Host computer
  H|\^&|||CS-2000i^00-00^11001^^^USERINSNO^06317410|||||||E1394-97<CR>
- Host computer -> IPU
  H|\^&|||||||||||E1394-97<CR>

Table 9 : Details of Header record

ASTM Field	Field Name	IPU -> Host	Host -> IPU	Max. size (Bytes)	Remarks
7.1.1	Record type	H	H	1	Fixed
7.1.2	Delimiter definition	|\^&	|\^&	4	Fixed
7.1.3	Message control ID	Not used	Not used	-	
7.1.4	Access password	Not used	Not used	-	
7.1.5	Sender name or ID	Analyzer name^ Software version^ Analyzer serial No.^ Interface version^ Logical ID number ^ Nickname^ PS code	Not used	8^ 13^ 5^ ^ ^ 15^ 8	
7.1.6	Sender street address	Not used	Not used	-	
7.1.7	Reserved field	Not used	Not used	-	
7.1.8	Sender Telephone No.	Not used	Not used	-	
7.1.9	Sender characteristics	Not used	Not used	-	
7.1.10	Receiver ID	Not used	Not used	-	
7.1.11	Comment	Not used	Not used	-	
7.1.12	Processing ID	Not used	Not used	-	
7.1.13	ASTM Version No.	ASTM Version No.	ASTM Version No.	8	E1394-97 or 1
7.1.14	Date and Time of message	Not used	Not used	-	

[Detailed explanation of the fields]

1) 7.1.2 Delimiter definition
"|\^&" is used as a fixed character string. No field delimiter is required between 7.1.1 and 7.1.2

2) 7.1.5 Sender name or ID

Analyzer name:	Fixed as "CS-2000i" or"CS-2100i".
Software version:	Refers to the software version loaded on the CS-2000i/CS-2100i It is output only when [System Stteings]-[Host Computer]-[Format ASTM]-[Detailed setting]-[Output the software version] is ON.
Analyzer Serial No.:	Analyzer serial number is output.
Interface version:	Not used
Logical ID number:	Not used
Nickname:	Analyzer nickname is output.
PS code:	"06317410" is output in CS-2000i. "06372511" is output in CS-2100i.

3) 7.1.13 ASTM Version No.

If the presentation layer is E1394-97, the version number is “E1394-97”.
If the layer is E1394-95, the version number is “1”.

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of “Analyzer name”, “Analyzer Serial No.”, “Nickname”, “PS Code”, “ASTM Version No.” and “Receiver ID” between CS-2000i/CS-2100i and each device.

5.3.3.2.Patient information Record

[Example of transmission]

- IPU -> Host computer
  P|1||||^Thomas^Johnson <CR>
- Host computer -> IPU
  P|1|||100|^Thomas^Johnson||20010820|M|||||^Dr.2|||||||||||^^^EAST<CR>

Table 10 : Details of Patient Information Record

ASTM Field	Field Name	IPU -> Host *1	Host -> IPU	Max. size (Bytes)	Remarks
8.1.1	Record type	P	P	1	Fixed
8.1.2	Sequence No.	Sequence No.	Sequence No.	4	Sequence No. of records
8.1.3	Practice assigned Patient ID	Not used	Not used	-	
8.1.4	Laboratory assigned patient ID	Not used	Not used	-	
8.1.5	Patient ID No.	Not used	Not used	-	
8.1.6	Patient name	^First name ^Last name	^First name ^Last name	^20^20	
8.1.7	Mother's maiden name	Not used	Not used	-	
8.1.8	Birth date	Not used	Not used	-	
8.1.9	Patient sex	Not used	Not used	-	
8.1.10	Patient race	Not used	Not used	-	
8.1.11	Patient address	Not used	Not used	-	
8.1.12	Reserved	Not used	Not used	-	
8.1.13	Patient telephone No.	Not used	Not used	-	
8.1.14	Attending physician name	Not used	Not used	-	
8.1.15	Special field 1	Not used	Not used	-	
8.1.16	Special field 2	Not used	Not used	-	
8.1.17	Patient height	Not used	Not used	-	
8.1.18	Patient weight	Not used	Not used	-	
8.1.19	Patient's known or suspected diagnosis	Not used	Not used	-	
8.1.20	Patient active medications	Not used	Not used	-	
8.1.21	Patient diet	Not used	Not used	-	
8.1.22	Practice field 1	Not used	Not used	-	
8.1.23	Practice field 2	Not used	Not used	-	
8.1.24	Admission and discharge dates	Not used	Not used	-	
8.1.25	Admission status	Not used	Not used	-	
8.1.26	Location	Not used	Not used	-	
8.1.27	DRG or AVG	Not used	Not used	-	
8.1.28	DRG or AVG2	Not used	Not used	-	
8.1.29	Patient religion	Not used	Not used	-	
8.1.30	Marital status	Not used	Not used	-	
8.1.31	Isolation status	Not used	Not used	-	
8.1.32	Language	Not used	Not used	-	
8.1.33	Hospital service	Not used	Not used	-	
8.1.34	Hospital institution	Not used	Not used	-	
8.1.35	Dosage category	Not used	Not used	-	

*1 To output the QC data, all fields other than 8.1.1 “Record Type” and 8.1.2 “Sequence number” are not used.

[Detailed Explanation of the fields]

1) 8.1.2 Sequence No.

The sequence number starts with 1 and indicates sequence position in which the record appeared in the message. This number is reset to 1 when a higher-level record appears in the message.

2) 8.1.6 Patient name

The first name and the last name may be 20 characters each with consisting of alpha-numeric.

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of “Patient name” between CS-2000i/CS-2100i and each device.

5.3.3.3. Request Information Record

[Example of transmission]

- IPU-> Host computer
  Q|1|1^1^ 1234567890^B|||^^^040^PT|0|20010905150000<CR>
- Host computer -> IPU
  Not used

Table 11 : Details of Request Information Record

ASTM Field	Field Name	IPU -> Host	Host -> IPU	Max. size (Bytes)	Remarks
12.1 1	Record Type	Q	Not used	1	
12.1.2	Sequence No.	1	Not used	4	
12.1.3	Starting Range ID No.	Rack No.^ Tube position^ Sample ID No.^ Sample ID No. attribute	Not used	6^ 2^ 15^ 1^	
12.1.4	Ending Range ID No.	Not used	Not used	-	
12.1.5	Universal test ID	^^^Test code (See the Table 16) Test name When requesting multiple parameters, use the repeat symbol as below: Test parameter information1 \Test parameter information 2\Test parameter information 3\Test parameter information4\…	Not used	^^^3 ^8	
12.1.6	Nature of request day limit	0	Not used	1	0: Request date Request date is not defined in the ASTM.
12.1.7	Beginning request date and time	YYYYMMDDHHMMSS	Not used	14	
12.1.8-12.1 13	Ending request result date through Requested information status code	Not used	Not used	-	

[Detailed Explanation of the field]

1) 12.1.2 Sequence No.

The sequence number starts with 1 and indicates the sequence position in which the record appeared in the message. The number is reset to 1 when a higher-level record appears in the message.

2) 12.1.3 Starting Range ID No.

Rack No.: Assigned to the rack. STAT table, reagent table are described as below.
Normal sample: Consisted of 6-digit alpha-numeric (The rack number will be fixed 6-digit number by aligning to the right and padding zero's to the most significant digits if the number is less than 6-digit.)
STAT sample: Describes with STATΔΔ (Δ indicates a space character.)
Reagent table: Describes with REAG00

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Rack No." between CS-2000i/CS-2100i and each device.

Tube Position : The sample rack position number within a rack, with consisting of 2-digit number.
Normal sample: 01 - 10
STAT sample: 01- 05
Reagent table: ΔΔ (Δ indicates a space character.)

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Tube Position" between CS-2000i/CS-2100i and each device.

Sample ID number: Consisted of 15-digit of alpha-numeric. Depends on the direction for use, the hyphen "-"(2DH) can be inserted between characters. "-"is included in 15-digit number. The zero suppression function is not performed. If the number is less than 15-digit, it is aligned to the right and spaces (020H) are padded to the most significant digit. If the sample barcode can not be read, the sample ID number beginning with "□□ERR0000000001" or "ERR000000000001" is sequentially assigned to the sample number. (The symbol "□□" indicates a space character.) The sample number beginning with "QC" is reserved to use for the QC analysis.

Note: In the System Settings screen, Sample No. in Barcode Reading Error is selectable from 13-digit ("□□ERR0000000001") or 15-digit ("ERR000000000001") to output. (The symbol "□□" indicates a space character.)

Sample ID No. attribute:
- M Sample ID No. is manually entered through the touch panel or the IPU keyboard.
- A Analyzer automatically assigned number; begins with "ERR".
- B Barcode reader read number. This is used when the sample ID number is read by the ID barcode reader.

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Sample ID No. attribute" between CS-2000i/CS-2100i and each device.

3) 12.1.5 Universal test ID

Test code: Suffixing 0 to the “Host ID” in the “Basic” in the "Assay Group Setting" makes the test code. See the **Table 156 : Parameter Code Lists**

Test name: The test name is the “Abbreviation” in the “Basic” in the “Assay Group Setting". It is consisted of up to 8 characters. See the **Table 156 : Parameter Code Lists**.

4) 12.1.7 Beginning request result date and time

The date format is fixed with "YYYYMMDDHHMMSS".
Here, YYYY indicates the year, MM the month, DD the day, HH the hour in the 24-hour system (00-23), MM the minute (0-59), SS the second (0-59).

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of “Date and time to start requesting results” between CS-2000i/CS-2100i and each device.

5.3.3.4.Test Order Record

[Example of transmission]

- IPU -> Host computer
  O|1|||000001^01^123456789012345^B^E||R|||||N<CR>
- Host computer -> IPU
  O|1|000001^01^123456789012345^B|||^^^040^^100.00\^^^050^^100.00\・・・
  \^^^060^^100.00|R|20010807101000||||N<CR>

Table 12：Details of Test Order Record

ASTM Field	Field name	IPU-> Host computer	Host computer -> IPU	Max. size (Byte)	Remarks
9.4.1	Record type	O	O	1	Fixed
9.4.2	Sequence No.	Sequence No.	Sequence No.	4	Sequence No. of records
9.4.3	Specimen ID	Not used	Rack No.^ Tube Position^ Sample ID No.^ Sample ID No. attribute	6^ 2^ 15^ 1	Sample ID No. attribute is one of the followings: M: Manual entry A: Automatically assigned by analyzer B: Barcode reader
9.4.4	Instrument specimen ID	Rack No.^ Tube Position^ Sample ID No.^ Sample ID No. attribute^ Extended order request flag	Not used	6^ 2^ 15^ 1^ 1	
9.4.5	Universal Test ID	Not used	^^^Test code ^^Dilution ratio^Option When requesting multiple parameters, use the repeat symbol as below: Test parameter information1 \Test parameter information2\Test parameter information 3\Test parameter information4\…	^^^3 ^^8^3	
9.4.6	Priority	Priority	Priority	1	S(STAT, STAT sample) R(Routine, Normal sample)
9.4.7	Requested/order date and time	Not used	YYYYMMDDHHMMSS	14	
9.4.8 - 9.4.11	Specimen collection date and time through Collector ID	Not used	Not used	-	
9.4.12	Action code	Action code	Action code	1	N Normal sample Q QC material
9.4.13 -	Danger code through	Not used	Not used	-	

ASTM Field	Field name	IPU-> Host computer	Host computer -> IPU	Max. size (Byte)	Remarks
9.4.31	Material institution				

[Detailed explanation of the field]

1) 9.4.2 Sequence No.

The sequence starts with 1 and indicates the sequence position in which the record appeared in the message. This number is reset to 1 when a higher-level record appears in the message.

2) 9.4.3 Specimen ID

Rack No.: Up to 6-digit alpha-numeric assigned to the rack. Return the same number that was inquired.

Tube Position : The sample position number with in a rack with consisting of 2-digit number. Return the same number that was inquired.

Sample ID number: Consisted of 15-digit of alpha-numeric and hyphen "-"(2Dh). Return the same number that was inquired.

Sample ID No. attribute: Indicates how the sample ID No.was registered. Return the same number that was inquired.

3) 9.4.4 Instrument Specimen ID

Rack No.: Assigned to the rack. In the STAT table and reagent table, Rack No. is described as below.

- Normal sample: 6-digit alpha-numeric
  (The rack number will be fixed 6-digit number by aligning to the right and padding zero's to the most significant digits if the number is less than 6-digit.)
- STAT sample: STATΔΔ (Δ indicates a space character.)
- Reagent table: REAG00
- Integrated data of Platelet Aggregation: ΔΔΔΔΔ (Δ indicates a space character.)

Caution :
Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Rack No." between CS-2000i/CS-2100i and each device.

Note :
"Integrated data of Platelet Aggregation" means the data of the aggregation ratio calculated from measurement result of PPP and PRP.

Tube Position : The sample position number with in a rack with consisting of 2-digit number.

- Normal sample: 01 - 10
- STAT sample: 01 – 05
- Reagent table: ΔΔ (Δ indicates a space character.)
- Integrated data of Platelet Aggregation: ΔΔ (Δ indicates a space character.)

Caution :
Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Tube Position" between CS-2000i/CS-2100i and each device.

Note :
"Integrated data of Platelet Aggregation" means the data of the aggregation ratio calculated from measurement result of PPP and PRP.

Sample ID number: Consisted of 15-digit alpha-numeric. Depends on the direction for use, the hyphen "-"(2DH) can be inserted between characters. "-"is included in 15-digit number. The zero suppression function is not performed. If the number is less than 15-digit, it is aligned to the right and spaces (020H) are padded to the most significant digit. If the sample barcode can not be read, the sample ID number beginning with "□□ERR0000000001" or "ERR000000000001" is assigned sequentially to the sample number. (The symbol "□□" indicates a space character.) The sample number beginning with "QC" is reserved to use for the QC analysis.

Note: In the System Settings screen, Sample No. in Barcode Reading Error is selectable from 13-digit ("□□ERR0000000001") or 15-digit ("ERR000000000001") to output. (The symbol "□□" indicates a space character.)

Sample ID No. attribute:
M: sample ID No. is manually entered through the touch panel or the IPU keyboard.
A: Automatically assigned number by the analyzer. This number is assigned by the automatic-increment function, and is used to set the sample number that begins with "ERR", which is used when the ID Read error occurred.
B: Barcode reader read number. This is used when the sample ID number is read by the ID barcode reader.

Caution :
Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Sample ID No. attribute" between CS-2000i/CS-2100i and each device.

Extended order request flag:
E: Extended order
Indicates the analysis is continued, based on the rules of the analyzer. If the analysis is not continued, it is skipped.

Caution :
Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Extended order request flag" between CS-2000i/CS-2100i and each device.

4) 9.4.5 Universal Test ID

When an order is sent from the host computer to the IPU, set the Universal Test ID which is sent in the "Universal Test ID" in the section "4.3.3.3 Details the Request Information Record". If there are no parameters, it can be skipped.

Test code: Suffixing 0 to the "Host ID" in the "Basic" in the "Assay Group Setup" makes the test code. See the **Table 156 : Parameter Code Lists**

Dilution ratio: Specifies the dilution ratio used in analysis with percent. If it is not specified, follows the instrument setting. The dilution ratio can be specified with including 2-digit of decimal number.
The dilution ratio in the CS-2000i/CS-2100i which differs from the ordered dilution ratio by less than 0.01 percent is used for analysis.
Note: If the MDA is set in the "Default Dilution Ratio" in the "Basic" in the "Assay Group Setup", the MDA analysis is performed in disregard of the dilution ratio from the host

computer.
* If the unregistered dilution ratio in the CS-2000i/CS-2100i is ordered, the “Default Dilution Ratio” in the “Basic” in the “Assay Group Setup” is used for analysis.

> **Warning:**
> **The setting of the dilution ratio may have a critical impact on analysis results.**
> **Set the standard setting of the dilution ratio to 100 percent. If other than 100 percent is set to the dilution ratio, make sure that it is the correct value. The instrument will accept a dilution ratio of 0%.**

> Note:
> The redilution, re-analysis and reflex test are performed according to the instrument setting even if the analysis is specified at the dilution ratio different from the instrument setting. If the redilution, re-analysis and reflex test are not performed, specify the option from the host computer.

Option: Sets the performance of the redilution, re-analysis and reflex test. More than 1 option can be set with the combinations of “D”, “R” and “F”. If there are no settings, follows the instrument settings

D: No redilution
R: No re-analysis
F: No reflex test

5) 9.4.6 Priority

S : STAT, STAT sample
R : Routine, Normal sample

6) 9.4.7 Requested/order date and time

Indicates the date and time of the analysis for the inquiry sample.
The date format is fixed with "YYYYMMDDHHMMSS".
Here, YYYY indicates the year, MM the month, DD the day, HH the hour in the 24-hour system (00-23), MM the minute (0-59), SS the second (0-59).

> Caution :
> Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of “Requested order date and time” between CS-2000i/CS-2100i and each device.

7) 9.4.12 Action code

Indicates the contents of the result record to be sent.

N Normal sample
Q QC sample

5.3.3.5.Result record

[Example of transmission]

- IPU -> Host computer

  R|1|^^^041^PT sec^100.00^9^^^|10.2|sec||N|||||20070328135056<CR>

  R|2|^^^042^PT %^100.00^9^^^| 99.4|%||N|||||20070328135056<<CR>

  ……

- Host computer -> IPU

  Not used

Table 13 : Details of the Result record

ASTM Field	Field name	IPU -> Host computer	Host computer -> IPU	Max. size (Byte)	Remarks
10.1.1	Record type	R	Not used	1	
10.1.2	Sequence No.	Sequence No.	Not used	4	Sequence No. beginning with 1
10.1.3	Universal Test ID	^^^Test code^ Parameter ^Dilution ratio^ Analysis result type^Extended order request^ Extended order result^ Reflex test request	Not used	^^^3^ 24^6^ 1^ 1 ^1^1	Test code: Described in Test code (Table 16) : Parameter: Up to 24 characters
10.1.4	Data or measurement value	Value	Not used	6	Up to 6 characters
10.1.5	Units	Units	Not used	7	
10.1.6	Reference ranges	Not used	Not used	-	
10.1.7	Result abnormal flags	Result abnormal flags Evaluation Information Instrument Error Information	Not used	1^Not specified^ Not specified	Evaluation Info. and Instrument error information are output only when the format is ASTM E1381-02 and also when it is set to output error information.
10.1.8	Nature of abnormality testing	Not used	Not used	-	
10.1.9	Result status	Not used	Not used	-	
10.1.10	Date of change in instrument normative values	Not used	Not used	-	
10.1.11	Operator identification	Not used	Not used	-	
10.1.12	Date/Time test started	Not used	Not used	-	
10.1.13	Date/Time test completed	YYYYMMDDHHMMSS	Not used	14	
10.1.14	Instrument identification	Not used	Not used	-	

[Detailed explanation of the field]

1) 10.1.2 Sequence No.

The sequence number starts with 1 and indicates the sequence position in which the record appeared in the message. This number is reset to 1 when a higher-level record appears in the message.

2) 10.1.3 “Universal test ID” through 10.1.13 “Date time test completed”

Fields to be set will vary depending on the contents to be transmitted.

2.1) When test parameters are output: The parameters for which analysis orders are registered are output.

a) 10.1.3 Universal Test ID

Test code: Indicates the assay parameter.
Consisted of the combination between the “Host ID” in the “Basic” in the “Assay Group Setup” and the “Host ID” in the “Assay Parameter" in the “Assay Group Setup”. See the Table 17 : Parameter Code Lists(Result).

Parameter: Consisted of up to 24 characters. The characters in the “Abbreviation” in the “Assay Group Setup” are output. See the Table 17 : Parameter Code Lists(Result).

Dilution ratio: Outputs the dilution ratio used in analysis with percent. It is indicated with including 2-digit of decimal number.

*If the MDA is set in the “Default Dilution Ratio” of the “Basic” in the “Assay Group Setup”, the sub- field of the dilution ratio in the final report is skipped.

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of “Dilution ratio” between CS-2000i/CS-2100i and each device.

Analysis result type:

1: Normal (Auto output)
2: Average (Auto output)
3: Re-analysis (Auto output)
4: Average of re-analysis (Auto output)
5: Normal (Manual Output)
6: Average (Manual Output)
7: Re-analysis (Manual Output)
8: Average of re-analysis (Manual Output)
9: Final information (Auto output)
A: Final information (Manual Output)

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of “Analysis result type” between CS-2000i/CS-2100i and each device.

Extended order request: Indicates the redilution analysis and re-analysis are performed by the analyzer, based on the rules of the analyzer. Other than that, the extended order request is not added.
D: Redilution request
R: Re-analysis request

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of “Extended order request” between CS-2000i/CS-2100i and each device.

Extended order results: Indicates the analysis result is one of the followings: the result of the redilution analysis, or reanalysis or reflex test. Other than that, the result is not output.
D: Results of redilution analysis
R: Results of re-analysis
F: Results of reflex test

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Extended order results" between CS-2000i/CS-2100i and each device.

Reflex test request: Indicates the reflex test is performed by the analyzer, based on the rules of the analyzer. Other than that, the extended order request is not added.
F: Reflex test request

Caution : Refer to [Appendix B. Difference List of Transmission Content] as the difference in the specification of "Reflex test request" between CS-2000i/CS-2100i and each device.

b) 10.1.4 Data or measurement value

Up to 6-digit number. Data format is described in the Table 17 : Parameter Code Lists(Result). If the analysis results can not be obtained, the mask characters are input in part of the integral number. The mask characters are as follows.

*: Analysis failure
/: Average calculation failure
+: Display Digit Overflow
-: Calculation failure
X: No validated calibration curve in the calculation

c) 10.1.5 Units

Up to 7 characters
In the CS-2000i/CS-2100i, the units set in the IPU are output. (The ASTM describes the abbreviation of ISO standard should be used.) See the Table 17 : Parameter Code Lists(Result). If the unit is "Ratio" or "INR", they are not output.

d) 10.1.7 Result abnormal flag

L: Below lower patient limit
H: Above upper patient limit
<: Below lower report limit.
>: Above upper report limit
N: Normal test result
A: Analysis error

Evaluation Information

Outputs a string of characters consisting of the combination of the evaluation error code and error message, which is enclosed between square blackets "[]". If there is more than one evaluation information, they are separated by commas.
If there is no evaluation information, it is not output.

Example of output) |A^[0001.0002.0000 Initial fluctuation drop],[0008.0002.0000 Coagulation Curve Error : Sharp Drop]^|

* Instrument Error Information is output only if the setting of "Output Error Information" in the system settings is turned ON when the format is ASTM E1381-02.

*In some analysis errors, it varies if the data is output as a numeric value or masked data, depending on the setting of "Output Error Information" in the system settings. Table14.

Instrument Error Information

Outputs a string of characters consisting of the error code and error message, whici is enclosed between square blackets "[]".

If there is no Instruent error information, it is not output.

Example of output) |A^^[34422 Insufficient Reagent (Reagent Arm Liquid Surface Not Detected)]|

* Instrument Error Information is output only if the setting of "Output Error Information" in the system settings is turned ON when the format is ASTM E1381-02.

Table 14 : Analysis error, Result Abnormal Flags, and Display method of analysis results

*1: If the setting of "Output Error Information" in the system settings is turned ON and also"The data is not output when the coagulation curve error is found" is turned ON, the masked values are output.

Code	Message	Result abnormal flag	Display method of analysis results	
			When "Output Error Information" is turned OFF	When "Output Error Information" is turned ON
0000.0000.0000	[Dilution Ratio was Changed.]	N	Numeric values are output	Numeric values are output
0000.0000.0340	[Wave Changed 340nm]	N	Numeric values are output	Numeric values are output
0000.0000.0405	[Wave Changed 405nm]	N	Numeric values are output	Numeric values are output
0000.0000.0575	[Wave Changed 575nm]	N	Numeric values are output	Numeric values are output
0000.0000.0660	[Wave Changed 660nm]	N	Numeric values are output	Numeric values are output
0000.0000.0800	[Wave Changed 800nm]	N	Numeric values are output	Numeric values are output
0000.0000.1100	[Vial QC has not performed.]	A	Numeric values are output	Numeric values are output
0000.4000.0010	[Display Digit Overflow]	N	Masked values are output	Masked values are output
0000.4000.0020	[Calculation Failure]	N	Masked values are output	Masked values are output
0000.4000.0030	[Validated Calibration Curve is not found.]	N	Masked values are output	Masked values are output
0000.4000.0041	[Extrapolation Boundary Over (Upper)]	N	Masked values are output	Masked values are output
0000.4000.0042	[Extrapolation Boundary Over (Lower)]	N	Masked values are output	Masked values are output
0000.4000.0050	[Calculated later.]	N	Numeric values are output	Numeric values are output
0000.5000.0010	[Formula Calculation Failure]	N	Masked values are output	Masked values are output
0000.5000.0020	[Formula Calculation Failure]	N	Masked values are output	Masked values are output
0000.5000.0050	[Problem in Calculating Formula]	N	Masked values are output	Masked values are output
0000.6000.0100	[Upper Report Limit Over]	>	Numeric values are output	Numeric values are output
0000.6000.0200	[Lower Report Limit Over]	<	Numeric values are output	Numeric values are output
0000.6000.0300	[Upper Mark Limit Over]	H	Numeric values are output	Numeric values are output
0000.6000.0400	[Lower Mark Limit Over]	L	Numeric values are output	Numeric values are output
0000.6000.0500	[MDA Slope Ratio Over]	A	Numeric values are output	Numeric values are output
0000.6000.0600	[Difference between replicated results]	A	Numeric values are output	Numeric values are output
0000.7000.0020	[Mean Calculation Failure]	N	Masked values are output	Masked values are output
0001.0000.0000	[Detector Block Temperature Error]	A	Masked values are output	Masked values are output
0002.0000.0000	[Slight Coagulation]	A	Numeric values are output	Numeric values are output
0004.0000.0000	[Analysis Time Over]	A	Numeric values are output	Numeric values are output

Code	Message	Result abnormal flag	Display method of analysis results	
			When "Output Error Information" is turned OFF	When "Output Error Information" is turned ON
0008.0001.0000	［Initial fluctuation drop］	A	Masked values are output	Numeric values are output *1
0008.0002.0000	［Coagulation Curve Error: Sharp Drop］	A	Masked values are output	Numeric values are output *1
0008.0004.0000	［Coagulation Curve Error: Dip］	A	Masked values are output	Numeric values are output *1
0008.0008.0000	［Coagulation Curve Error: Jump Up］	A	Masked values are output	Numeric values are output *1
0008.0016.0000	［Coagulation Curve Error: Stepping Curve］	A	Masked values are output	Numeric values are output *1
0008.0032.0000	［Coagulation Curve Error: Fbg Curve Error］	A	Masked values are output	Numeric values are output *1
0008.0064.0000	［Coagulation Curve Error: Terrace］	A	Masked values are output	Numeric values are output *1
0008.0128.0001	［Early Reaction Error :Slow Reaction］	A	Masked values are output	Masked values are output
0008.0128.0002	［Early Reaction Error :Start Angle 1］	A	Masked values are output	Masked values are output
0008.0128.0004	［Early Reaction Error :Start Angle 2］	A	Numeric values are output	Numeric values are output
0008.0128.0008	［Early Reaction Error :Drift］	A	Masked values are output	Masked values are output
0008.0128.0016	［Early Reaction Error :Early %］	A	Masked values are output	Masked values are output
0008.0256.0000	[Noise]	A	Masked values are output	Masked values are output
0016.0000.0000	［Turbidity Level Over］	A	Masked values are output	Masked values are output
0032.0000.0000	［No Coagulation］	A	Masked values are output	Masked values are output
0032.0002.0000	[Flat Curve]	A	Masked values are output	Masked values are output
0064.0000.0000	［Aged Sample］	A	Masked values are output	Numeric values are output *1
0128.0000.0000	［Range Over］	A	Masked values are output	Masked values are output
0256.0000.0000	［Trans Light High:Clot.］	A	Masked values are output	Masked values are output
4001.0000.0000	［Trans Light Low］	A	Masked values are output	Masked values are output
4002.0000.0000	［Trans Light High:Chro.Imm.］	A	Masked values are output	Masked values are output
4004.0000.0000	［No Linearity］	A	Masked values are output	Masked values are output
4008.0000.0000	［Reaction Curve Error］	A	Masked values are output	Masked values are output
4016.0000.0000	［Antigen Excess］	A	Masked values are output	Masked values are output
4128.0000.0000	［No Polynomialadjustment］	A	Masked values are output	Masked values are output
4256.0000.0000	［Range in non-linear］	A	Masked values are output	Masked values are output
9999.0000.0000	［Measurement Failure］	A	Masked values are output	Masked values are output
9999.0000.9010	［TEST_RECV_ELSE_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9020	［ASSY_CALV_PARA_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9030	［ASSY_CALV_INF_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9040	［ASSY_ANLY_CALC_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9050	［ASSY_RECV_ELSE_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9060	［ASSY_ANLY_NOPRISET_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9070	［ASSY_ANLY_NORESULT_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9080	［ASSY_ANLY_DILUTION_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9090	［ASSY_CALY_NODATA_ERROR］	N	Masked values are output	Masked values are output
9999.0000.9100	［ASSY_AVER_IRIGALRESULT_ERROR］	N	Masked values are output	Masked values are output
9999.0000.91100	［TEST_REAGENTLOT_ERROR］	N	Masked values are output	Masked values are output
Unknown9999	［Unknown Message］	N	Numeric values are output	Numeric values are output

e) 10.1.13 Date /time test completed

Indicates the date and time the test was completed.
The date format is fixed with "YYYYMMDDHHMMSS".
Here, YYYY indicates the year, MM the month, DD the day, HH the hour in the 24-hour system (00-23), MM the minute (0-59), SS the second (0-59).

2.2) When Sample Info. flags are output: The parameters to which HIL flags or Sample Volume flag are based on the [System Stteings]-[Host Computer]-[Format ASTM]-[Detailed setting]on IPU.

(Caution)
Sample Info. flags are used only for inspection in a clinical laboratory and not for examination of a patient. They notify an operator of the possibility of the specific abnormal sample confirmed by checking analysis data.

a) 10.1.3 Universal Test ID

Test Code: Not used.
Parameter: Indicates the content of HIL flags.
Hemolytic Sample: Sample suspected of having hemolysis.
Icterous Sample: Sample suspected of having icterus.
Lipemic Sample: Turbid sample affected by lipemia or other materials.
Defective Sample Volume: Sample suspected of inappropriate volume.*
Dilution ratio: Not used.
Analysis result type: Not used.
Extended order request: Not used.
Extended order results: Not used.
Reflex test request: Not used.

b) 10.1.4 Data or measurement value

Not used.

c) 10.1.5 Units

Not used.

d) 10.1.7 Result abnormal flag

A: Result with HIL flags or Sample Info. n flag
W: Above the analysis range of the HIL detector (Only for HIL flags)
For Sample Volume flag
Output Sample Volume flags only in case of defective sample volume: ON
Outputs sample volume flags with the following defective sample volume flag when the sample volume is outside the specified range.
When the sample volume is within the specified range, the defective sample volume flag is not output.
A: When the sample volume is outside the specified range.

Output Sample Volume flags only in case of defective sample volume:OFF
Outputs sample volume flags with either of the following flags, regardless of whether the sample volume is outside the specified range.
A: When the sample volume is outside the specified range
N: When the sample volume is within the specified range

e) 10.1.13 Date /time test completed

Indicates the date and time the test was completed.
The date format is fixed with "YYYYMMDDHHMMSS".

Here, YYYY indicates the year, MM the month, DD the day, HH the hour in the 24-hour system (00-23), MM the minute (0-59), SS the second (0-59).

5.3.3.6.Message termination record

[Example of transmission]

- IPU -> Host computer

  L|1|N<CR>

- Host computer -> IPU

  L|1|N<CR>

Table 15 : Message termination record

ASTM Field	Field name	IPU -> Host computer	Host computer -> IPU	Max. size (Byte)	Remarks
13.1.1	Record type	L	L	1	Fixed
13.1.2	Sequence No.	1	1	4	Always 1
13.1.3	Termination cord	N	N	1	N: Normal termination

6. Examples of Communication

6.1. Inquiry of Analysis Order (IPU => Host Computer)

・When the order inquiry is performed from IPU

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^^10000001^^^CANEXT^06317410|||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2Q|1|000001^01^ 1^B||^^^040^PT\^^^060^Fbg\^^^120^II\^^^150^V\^^^170^VII\^^^180^VIII\^^^ 190^IX\^^^200^X\^^^210^XI\^^^300^AT3\^^^310^APL|0|20070328133318<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

6.2. Analysis Order (Host Computer => IPU)

・When the host computer sends orders to IPU

Host	<ENQ>
IPU	<ACK>
Host	<STX>1H|\^&||||||||||E1394-97|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>2P|1|||100|^Thomas^Johnson||20010820|M|||||^Dr.2||||||||||||^^^EAST|||||| |||<CR><ETX><CHK1><CHK2> <CR><LF>
IPU	<ACK>
Host	<STX>3O|1|000001^01^ 1^B||^^^040^^100.00^DF\^^^050^^100.00\^^^060^^100.00\^^^040^^100.00^DR|R|20070330123159 |||||N||||||||||||||||||<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>4L|1|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<EOT>

6.3. Analysis Results (IPU => Host Computer)

6.3.1. When analysis is performed 1 time

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^00-30^10000001^^^CANEXT^06317410|||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1||||^Thomas^Johnson <ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3O|1||000001^01^ 1^B^||R|||||N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|1|^^^041^PT sec^100.00^9^^^|

	10.2|sec||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^9^^^| 99.4|%||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^9^^^| 0.57|||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^9^^^| 0.81|||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^9^^^| 27.4|sec||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^9^^^| 8.5|sec||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^9^^^| 588.2|mg/dL||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3R|8|^^^^Hemolytic Sample^^^^^|||A|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|9|^^^^Defective Sample Volume^^^^^|||N|||||20070328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

6.3.2. Transmitting Analysis Results (When there is the re-analysis)

- Transmitting Analysis Results (The first analysis)

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^00-30^10000001^^^CANEXT^06317410|||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1||||^Thomas^Johnson <ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3O|1||000001^01^ 1^B^||R|||||N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|1|^^^041^PT sec^100.00^1^R^^| 10.2|sec||N|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^1^R^^| 99.4|%||N|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^1^R^^| 0.57|||N|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^1^R^^| 0.81|||N|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^1^^^| 27.4|sec||N|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>

IPU	<STX>1R|6|^^^061^Fbg sec^100.00^1^^^| 8.5|sec||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^1^^^| 588.2|mg/dL||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3R|8|^^^^Icterous Sample^^^^^|||W|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|9|^^^^Lipemic Sample^^^^^|||A|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|10|^^^^ Defective Sample Volume^^^^^|||A|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

・ Transmitting Analysis Results (The re-analysis)

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^00-30^10000001^^^CANEXT^06317410|||||||E1394-97<ETX><C HK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1||||^Thomas^Johnson <ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3O|1||000001^01^ 1^B^E||R|||||N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|1|^^^041^PT sec^100.00^3^^R^| 10.2|sec||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^3^^R^| 99.4|%||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^3^^R^| 0.57|||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^3^^R^| 0.81|||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^^Icterous Sample^^^^^|||W|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^^Lipemic Sample^^^^^|||A|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^^ Defective Sample Volume^^^^^|||A|||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

・ Transmitting Analysis Results (The final analysis)

IPU	<ENQ>

Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^00-30^10000001^^^CANEXT^06317410|||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1||||^Thomas^Johnson <ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3O|1||000001^01^ 1^B^||R|||||N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|1|^^^041^PT sec^100.00^9^^R| 10.2|sec||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^9^^R| 99.4|%||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^9^^R| 0.57|||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^9^^R| 0.81|||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^9^^^| 27.4|sec||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^9^^^| 8.5|sec||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^9^^^| 588.2|mg/dL||N||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|8|^^^^Icterous Sample^^^^^|||W||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|9|^^^^Lipemic Sample^^^^^|||A||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|9|^^^^ Defective Sample Volume^^^^^|||A||||||20070328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

6.3.3. When analysis is performed 2 times

Example: Analysis result (The first analysis)

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^00-30^10000001^^^CANEXT^06317410|||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1||||^Thomas^Johnson <ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3O|1||000001^01^ 1^M^||R|||||N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|1|^^^041^PT sec^100.00^1^^^| 10.2|sec||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^1^^^|

	99.4|%||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^1^^^| 0.57|||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^1^^^| 0.81|||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^1^^^| 27.4|sec||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^1^^^| 7.9|sec||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^1^^^| 632.9|mg/dL||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

Example: Analysis result (The second analysis)

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^00-30^10000001^^^CANEXT^06317410||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1||||^Thomas^Johnson <ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3O|1||000001^01^ 1^M^||R||||||N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|1|^^^061^Fbg sec^100.00^1^^^| 7.9|sec||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^062^Fbg C.^100.00^1^^^| 632.9|mg/dL||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

Example: Analysis result (The final analysis)

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2000i^00-30^10000001^^^CANEXT^06317410||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1||||^Thomas^Johnson <ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3O|1||000001^01^ 1^M^||R||||||N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|1|^^^041^PT sec^100.00^9^^^| 10.2|sec||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>

IPU	<STX>5R|2|^^^042^PT %^100.00^9^^^| 99.4|%||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^9^^^| 0.57|||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^9^^^| 0.81|||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^9^^^| 27.4|sec||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^9^^^| 7.9|sec||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^9^^^| 632.9|mg/dL||N||||||20070328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

7. Parameter Code List

Table 156 : Parameter Code Lists

Assay Group	Parameter Code	Assay Group	Parameter Code
PT	04X	FVPCAT0	47X
APTT	05X	**Reserved**	50X
Fbg	06X	TT	51X
Reserved	07X	**Reserved**	52X
TTO	08X	PPP	53X
NT	09X	ADP	54X
Reserved	10X	Epi	55X
II	12X	Col	56X
V	15X	Ris	57X
VII	17X	Ara	58X
VIII	18X	**Reserved**	60X
IX	19X	DDimer	61X
X	20X	P-FDP	62X
XI	21X	**Reserved**	63X
XII	22X	**Reserved**	64X
PCcl	25X	vWF-Ag medium	65X
BXT	26X	vWF-Ag low	66X
LA1	27X	ADP%	67X
LA2	28X	Epi%	68X
PSAc	29X	Col%	70X
AT3	30X	Ris%	71X
APL	31X	Ara%	72X
Plg	32X	vWF-RCo	80X
PC(Chrom)	33X	**Reserved**	81X
Hep	34X	**Reserved**	82X
PAI	36X	**Reserved**	83X
C1 Inh	37X	**Reserved**	84X
VIII ch	39X	**Reserved**	85X
XIII ch	40X	**Reserved**	86X
LA R	41X	**Reserved**	87X
PCAT NR	42X	**Reserved**	88X
PCAT	43X	**Reserved**	89X
PCAT0	44X	**Reserved**	90X
FVPCAT NR	45X	**Reserved**	000
FVPCAT	46X	**Reserved**	999

000: There is no analysis parameter for the inquired sample.
999: There is no information on the inquired sample.

"X" is replaced with a one-digit host ID defined in the Assay Parameter Definition in when transmitting analysis results.
In the case of order inquiry, order information texts and the analysis data format of formula, "X" is replaced with 0.
New analysis parameters may be added in the future. Please prepare a receive program that ignores the data when receiving the codes other than the above-mentioned codes.

New analysis parameters may be added in the future. Please prepare a receive program that ignores the data when receiving the codes other than the codes shown in the parameter code list .
The following shows the default Host ID for assay parameter defined in the Assay Group Settings.

1: Time, dOD
2: Activity %/Concentration
3: Ratio
4: INR
5:DFbg

* The default Host IDs for assay parameter of platelet aggregation parameter (PPP, PRP) are set 1 or 2, both of them means absorbance (mOD).
* The Host IDs for assay parameter of Formula are set 1 as fixed value.

New analysis parameters may be added in the future. Please prepare a receive program that ignores the data when receiving the codes other than the codes shown above.

Table 167 : Parameter Code Lists(Result)

Test code	Test name	Units	Format	Test code	Test name	Units	Format
041	PT sec	sec	####.#	411	LA R		###.##
042	PT %	%	####.#	421	PCAT NR		###.##
043	PT R		###.##	431	PCAT sec	sec	####.#
044	PT INR		###.##	441	PCAT0 sec	sec	####.#
051	APTT sec	sec	####.#	451	FVPCAT NR		###.##
061	Fbg sec	sec	####.#	461	FVPCAT sec	sec	####.#
062	Fbg C.	g/L	##.###	471	FVPCAT0 sec	sec	####.#
07X	**Reserved**			50X	**Reserved**		
081	TTO sec	sec	####.#	511	TT sec	sec	####.#
082	TTO %	%	####.#	52X	**Reserved**		
084	TTO INR		###.##	531	PPP	mOD	#####
091	NT sec	sec	####.#	541	ADP_min	mOD	#####
092	NT %	%	####.#	542	ADP_s	mOD	#####
093	NT INR		###.##	551	Epi_min	mOD	#####
10X	**Reserved**			552	Epi_s	mOD	#####
121	II sec	sec	####.#	561	Col_min	mOD	#####
122	II %	%	####.#	562	Col_s	mOD	#####
151	V sec	sec	####.#	571	Ris_min	mOD	#####
152	V %	%	####.#	572	Ris_s	mOD	#####
171	VII sec	sec	####.#	581	Ara_min	mOD	#####
172	VII %	%	####.#	582	Ara_s	mOD	#####
181	VIII sec	sec	####.#	60X	**Reserved**		
182	VIII %	%	####.#	611	DD dOD	dOD	#.####
191	IX sec	sec	####.#	612	DD C.	ug/L	####.#
192	IX %	%	####.#	621	P-FDP dOD	dOD	#.####
201	X sec	sec	####.#	622	P-FDP C.	ug/mL	####.#
202	X %	%	####.#	63X	**Reserved**		
211	XI sec	sec	####.#	64X	**Reserved**		
212	XI %	%	####.#	651	vWF-Ag medium dOD	dOD	#.####
221	XII sec	sec	####.#	652	vWF-Ag medium %	%	####.#
222	XII %	%	####.#	661	vWF-Ag low dOD	dOD	#.####
261	BXT	sec	####.#	662	vWF-Ag low %	%	####.#
271	LA1 sec	sec	####.#	671	ADP%	%	####.#
281	LA2 sec	sec	####.#	681	Epi%	%	####.#
301	AT3 dOD	dOD	##.###	69X	**Reserved**		
302	AT3 %	%	####.#	701	Col%	%	####.#
311	APL dOD	dOD	##.###	711	Ris%	%	####.#
312	APL %	%	####.#	721	Ara%	%	####.#
321	Plg dOD	dOD	##.###	801	vWF-RCo low dOD	dOD	#.####
322	Plg %	%	####.#	802	vWF-RCo low %	%	####.#
331	PC dOD	dOD	##.###	81X	**Reserved**		
332	PC %	%	####.#	82X	**Reserved**		
341	Hep dOD	dOD	##.###	83X	**Reserved**		
342	Hep C.	U/mL	###.##	84X	**Reserved**		
36X	**Reserved**			85X	**Reserved**		
371	C1 Inh dOD	dOD	##.###	86X	**Reserved**		
372	C1 Inh %	%	####.#	87X	**Reserved**		
391	VIII ch dOD	dOD	##.###	88X	**Reserved**		
392	VIII ch %	%	####.#	89X	**Reserved**		
400	XIII ch dOD	dOD	##.###	90X	**Reserved**		
401	XIII ch %	%	####.#				

"X" is one-digit of parameter code for reserved.

Appendix. A　TCP/IP communication

A.1　Software

1) Data link/ Network/ Transport layer

The IP address of the IPU for the CS-2000i/CS-2100i is fixed. The default value is 192.168.37.252. When this value is to be changed, please contact a Sysmex technical representative.
The IP address for the host computer can be set using the setting screen in the IPU of CS-2000i/CS-2100i. This IP address may be selected other than "192.168.37.*" that is used to communicate with the IPU of the analyzer.
The TCP port number of the IPU of CS-2000i/CS-2100i for host communication is 5000. This value may be changed in the IPU setting screen.

2) Session layer

To establish the TCP connection, the host computer acts as a server and the IPU acts as a client. The IPU checks the communication on start-up. If the communication fails, the attempt to communicate is performed at intervals. If the server is aborted after communication is established, reconnection is not performed.

Appendix. B　Difference List of Transmission Content

The CS-2000i/CS-2100i outputs different content by the device specification from other analyzer.
Please observe the precautions for use and ensure the operation of sending and receiving systems works to use the host computer.

＜CA-1000＞

Contents	CA-1000	CS-2000i/CS-2100i	Caution
Analyzer name (Header record)	"CA-1000" is output.	"CS-2000i" or "CS-2100i" is output.	Please check the host computer is able to receive "CS-2000i" or "CS-2100i".
Analyzer Serial No. (Header record)	Not Use.	5-digit numbers is output.	Please check the host computer is able to receive 5-digit numbers.
Nickname (Header record)	Not Use.	Nickname is output.	Please check the host computer is able to receive 15-digit one-byte characters in maximum. Please do not set up anything on the process for "Facility name' – "System Setting" if the host computer has trouble to receiving half width 15-digit characters in maximum.
PS Code (Header record)	Not Use.	PS Code is output.	Please check the host computer is able to receive PS Code.
Receiver ID (Host -> CS-2000i/ CS-2100i) (Header record)	"CA-1000" is output.	Not Use.	The CS-2000i/CS-2100i does not use the ReceierID when the host computer send it to the CS-2000i/CS-2100i.
ASTM Version No. (Header record)	"1" is output.	The following content outputs based on the format type. E1394-97 : "E1394-97" E1394-95 : "1"	Please select "ASTM1381-95/1394-95" for format type in "System Setting"
Patient name (Patient Information Record)	Not Use.	First name(20-digit alpha-numeric in maximum) and Last name(20-digit alpha-numeric in maximum) is output.	Please do not output the results including the patient name. To enter the patient name, it works only from the enquiry order of host computer. Please do not use the patient name on enquiry order of host computer.
Rack Number (Ordinary Sample)	2-digit numbers is output. (Right 2-digit of Rack Number) The rack number appears in ascending order: '0001', '0002'… ('0099' of the following number is '0001'.)	6-digit alpha-numeric is output. The 6-digit rack numbers displayed in the CS-2000i/CS-2100i is output.	Please check the host computer is able to receive alphabets. Please operate the CS-2000i/CS-2100i to use numbers only (no alphabets) for the rack numbers if the host computer has trouble receiving alphabet characters. Please check the host computer is able to receive 6-digit alphabets.
Rack Number (STAT Sample)	2-digit numbers is output. (Left 2-digit of Rack Number) The rack number(STAT Sample) appears in ascending order: '0100', '0200'… ('9900' of the following number is '0100'.)	"STAT□□"(□ is space) is output.	Please check the host computer is able to receive "STAT□□"(□ is space).
Rack Number (Reagent Table)	No target exists. CA-1000 does not operate if the control is set on the reagent table.	"REAG00" is output.	Please check the host computer is able to receive alphabets.

Rack Number/ Tube position (Platelet Aggregation Analysis)	CA-1000 does not have the function of platelet aggregation analysis.	The Integrated Data are output as below. Rack No.: □□□□□□ Tube position: □□ (□ is space)	Please check the host computer is able to receive space.
Tube Position	STAT Sample : ” 00” Reagent table : No target exists. CA-1000 does not operate if the control is set on the reagent table.	STAT Sample : 01～05 Reagent table : □□(□ is space.)	Please check the host computer is able to receive space.
ID Information	The CS-2000i/CS-2100i does not use “C : Set by the host computer order information”.		Please note the host computer does not output “C : Set by the host computer order information” and no other operation is working by using “C : Set by the host computer order information”.
Date and time to start requesting results (Request Information Record)	SS: “00” Fixed	SS: “00”-“59”	Please check the host computer is able to receive “00”～”59”.
Extended order request flag (Test Order Record)	Not Use.	“E” is output.	Please check the host computer is able to receive “E”.
Order of outputting Assay Group	Output by fixing. Order is as follows PT, APTT, Fbg, TTO, HpT, II, V, VII, VIII, IX, X, XI, XII, AT3, APL, Plg, BCPC, +Fbg, -Fbg, SFDP, DD, PFDP, +DD, +SFD, +PFD	Output by variable. Order is as follows The order of outputting Assay Group is an ascending order of HostID registered in Assay Group Setting	The CS-2000i/CS-2100i does not output “+Fbg, -Fbg, +DD, +SFD, +PFD”. The diluted assay group outputs the host ID of the assay group before dilution.
Dilution ratio (Resulted record)	Number of decimal places is not output.	Two places of decimals is output.	Please check the host computer is able to receive numbers to second decimal place.
Analysis result type (Resulted record)	Output as follows. CA-1000 does not use “3”, “4”, “7, “8”, ”9”, “A”. 1: Normal (Auto output) 2: Average (Auto output) 3: Re-analysis (Auto output) 4: Average of re-analysis (Auto output) 5: Normal (Manual Output) 6: Average (Manual Output) 7: Re-analysis (Manual Output) 8: Average of re-analysis (Manual Output) 9: Final information (Auto output) A: Final information (Manual Output)		Please check the host computer is able to receive "3", "4", "7", "8", "9", "A".
Extended order request (Resulted record)	Not Use.	Output as follows. D: Redilution request R: Re-analysis request	Please check the host computer is able to receive "D", "R".
Extended order results (Resulted record)	Not Use.	Output as follows. D: Results of redilution analysis R: Results of re-analysis F: Results of reflex test	Please check the host computer is able to receive "D", "R", "F".

Reflex test request (Resulted record)	Not Use.	“F” is output.	Please check the host computer is able to receive "F".
How to inquiry order	The CS-2000i/CS-2100i supports only “Smaple ID No.” for order inquiry. The CS-2000i/CS-2100i does not support “Rack No., Tube Position No.”. “Smaple ID No.” : How to search analysis parameters by sample number on start of measurement. “Rack No., Tube Position No.” : How to search sample number and analysis parameters by rack number and position		-

＜CA-8000/CA-7000/CA-1500＞

Contents	CA-1500	CS-2000i/CS-2100i	Caution
Analyzer name (Header record)	“CA-1500” is output.	“CS-2000i” or “CS-2100i” is output.	Please check the host computer is able to receive “CS-2000i” or “CS-2100i”.
PS Code (Header record)	Not Use.	PS Code is output.	Please check the host computer is able to receive PS Code.
Receiver ID (Host -> CS-2000i/ CS-2100i) (Header record)	‘Analyzer name^^ Analyzer Serial No.^^ Nickname’ is output.	Not Use.	The CS-2000i/CS-2100i does not use the ReceierID when the host computer send it to the CS-2000i/CS-2100i.
ASTM Version No. (Header record)	“1” is output.	The following content outputs based on the format type. E1394-97 : “E1394-97” E1394-95 : “1”	Please select “ASTM1381-95/1394-95” for format type in “System Setting”
Patient name (Patient Information Record)	15-digit alpha-numeric in maximum is output.	First name(20-digit alpha-numeric in maximum) and Last name(20-digit alpha-numeric in maximum) is output.	Please set 15-digit alpha-numeric in maximum for the patient name. To enter the patient name, it works only from the enquiry order of host computer.
Rack Number (Ordinary Sample)	6-digit numbers is output. The rack number appears in ascending order: ‘000001’, ‘000002’… (‘000099’ of the following number is ‘000001’.)	6-digit alpha-numeric is output. The 6-digit rack numbers displayed in the CS-2000i/CS-2100i is output.	Please check the host computer is able to receive alphabets. Please operate the CS-2000i/CS-2100i to use numbers only (no alphabets) for the rack numbers if the host computer has trouble receiving alphabet characters.
Rack Number (STAT Sample)	”STAT H” is output. (“StaHld” is output in the case of CA-7000/CA-8000.)	”STAT□□”(□ is space) is output.	Please check the host computer has received "STAT H" for the rack number of STAT sample and no other operation is working by using "STAT H" in the process. Please check the host computer is able to receive ”STAT□□”(□ is space).
Rack Number (Reagent Table)	”D1”～”D14” is output. (“C1-1”～”C2-5” is output in the case of CA-7000/CA-8000.)	”REAG00” is output.	Please check the host computer has received ”D1”～”D14” for the rack number of Reagent Table and no other operation is working by using ”D1”～”D14” in the process. Please check the host computer is able to receive “REAG00”.
Tube Position	STAT Sample : 01～05	STAT Sample : 01～10	-
ID Information	The CS-2000i/CS-2100i does not use “C : Set by the host computer order information”.		Please note the host computer does not output “C : Set by the host computer order information” and no other operation is working by using “C : Set by the host computer order information”.
Order of outputting Assay Group	Output by fixing. Order is as follows PT, APTT, Fbg, TTO, NT, II, V, VII, X, VIII, IX, XI, XII, TT, AT3, Apl, Plg, PC, FDP, DD.PLUS, PSAc, LA1, LA2	Output by variable. Order is as follows The order of outputting Assay Group is an ascending order of HostID registered in Assay Group Setting	-
How to inquiry order	The CS-2000i/CS-2100i supports only “Smaple ID No.” for order inquiry. The CS-2000i/CS-2100i does not support “Rack No., Tube Position No.”. “Smaple ID No.” : How to search analysis parameters by sample number on start of measurement. “Rack No., Tube Position No.” : How to search sample number and analysis parameters by rack number and position		-

＜The function which can be used by making the setting effective＞

The following function is the function which can be used by making the setting effective. Please ensure the host computer is adaptable to the function to be validated.

Function	Record	CS-2000i/CS-2100i
Software Version	Header Record 7.1.5 Sender name or ID	The CS-2000i/CS-2100i sofrtware version is output. ＊ It is output only when [System Stteings]-[Host Computer]-[Format ASTM]-[Detailed setting]-[Output the software version] is ON.
Error Informatio n	Resulted record 10.1.7 Result abnormal flags	The following is output. Evaluation Information : Outputs a string of characters consisting of the combination of the evaluation error code and error message, which is enclosed between square blackets “[]“. Instrument Error Information : Outputs a string of characters consisting of the error code and error message, which is enclosed between square blackets “[]”. * The Evalation Information and the Instrument Error Information are output only if the setting of “Output Error Information” in the system settings is turned ON when the format is ASTM E1381-02. * There are the evaluation errors that are output by either the mask characters or the numeric values
Sample Info. flags	Resulted record	Sample Info. flags are output. * The parameters to which HIL flags or Sample Volume flag are based on the [System Stteings]-[Host Computer]-[Format ASTM]-[Detailed setting] on IPU.