CS-2500 ASTM

Host Interface Specifications

for US

Revision 2.04

Revised on February 25, 2019

Sysmex Corporation

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1. General

This document is intended to supply the information that the CS-2500 Automated Blood Coagulation Analyzer communicates with the host computer using ASTM protocol.

2. Scope

This document describes the Data Communication Specifications for CS-2500 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	May 27, 2016	The first edition is issued based on CS-2500 ASTM Host Interface Specification Rev.1.20
2.00	April 12, 2017	Whole expression is changed according to "CS-5100 ASTM Host Interface Specifications Revision 2.00". Other revising points are following; 5.3.2.2.Analysis information (Host computer -> IPU) 　Caution of order for "Analysis Information" and "Analysis Order Inquiry" is added. 5.3.3.1.Header Record 　2) 7.1.5 Sender name or ID 　　PS code is corrected only "BV981798". 5.3.3.3.Request Information Record 　2) 12.1.3 Starting Range ID No. 　　Rack No.: 　　The description of rack No. with a reading error is added. 　5) 12.1.13 Requested information status code 　　Inquiry type : 　　The note of Set up auto re-analysis, auto re-dilution and reflex is changed. 5.3.3.4.Test Order Record 　3) 9.4.4 Instrument Specimen ID 　　Rack No.: 　　The description of rack No. with a reading error is added. 　4) 9.4.5 Universal Test ID 　　Measurement Time: 　　Default set value (OFF) is added. 5.3.3.5.Result record 　2.1) When test parameters are output: The parameters for which analysis orders are registered are output. 　a) 10.1.3 Universal Test ID 　　Replication: 　　Default set value (OFF) is added. 　2.3) The path name to the image data is output only when the parameters have the image data. 　b) 10.1.4 Data or measurement values 　　The description for time of detail is added. 　Table 15 : List of the information included in the file 　Test Date 　　The analyzed date format is corrected from 　　"YYYY_MM_DD_HH_MM" to "YYYY_MM_DD_HH_MM_SS" 　Caution 　　Output of Delayed Cross mixing image data 　　The format of CSV file; 　　　The Character Code is corrected from Shift-JIS to UTF-8. 　Table 17 : Parameter Code Lists 　　The tables is changed according to version 01-68. 　　The description of code "000" and "999" is added.

		Table 18 Parameter Code Lists(Result)
		    The table is changed according to version 01-68.
		
		Table 19 : Analysis error, Result Abnormal Flags, and Display method of analysis results
		    "Detector Block Temperature Error" is deleted:
		
		E. Difference List of Transmission Content
		    The all description of this section is deleted.
		    And related descriptions are deleted on each chapter.

2.01	October 17, 2017	The Host IDs of assay and formula are added.
2.02	January 24, 2018	The Host IDs of assay are added.
2.03	August 27, 2018	1) The Host IDs of assay are added. 2) 5.3.1.2　Added that "IPU needs [CR] at the end of the record regardless of System Settings." 3) Table 15 : List of the information included in the file Test Date The analyzed date format is corrected from "YYYY_MM_DD_HH_MM_SS" to "YYYY_MM_DD_HH_MM" 4) The description for new analysis parameters is duplicated. It is omitted.
2.04	February 25, 2019	1) The Host IDs of assay are added. 2) The comment of dilution ratio for image data is corrected. 3) The extension of the image data file in the example is corrected. 4) The caret for "Switch Measurement Time" in the example is corrected. 5) Some misspellings are corrected.

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 "5.1 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 "5.2 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 "5.3 Presentation Layer"

Presentation layer	← Specifies message specifications
Data link layer	← Specifies link connection and frame specifications
Physical layer	← Specifies mechanical and electrical specifications

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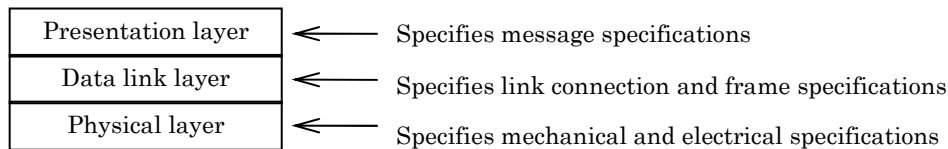
Notes
The information processing Unit (IPU) of the CS-2500 supports connection by the Ethernet and RS-232C.
From the combinations between the specifications conforming to two standards and connection types, CS-2500 supports the following three modes.

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.

```
  IPU                              Host computer
  DB-9                             DB-9     DB-25

  TxD      3                       3        2        TxD

  RxD      2                       2        3        RxD

  SG       5                       5        7        SG

  RTS      7                       7        4        RTS

  CTS      8                       8        5        CTS

  DTR      4                       4        20       DTR

  DSR      6                       6        6        DSR

  NC       1

  NC       9
```
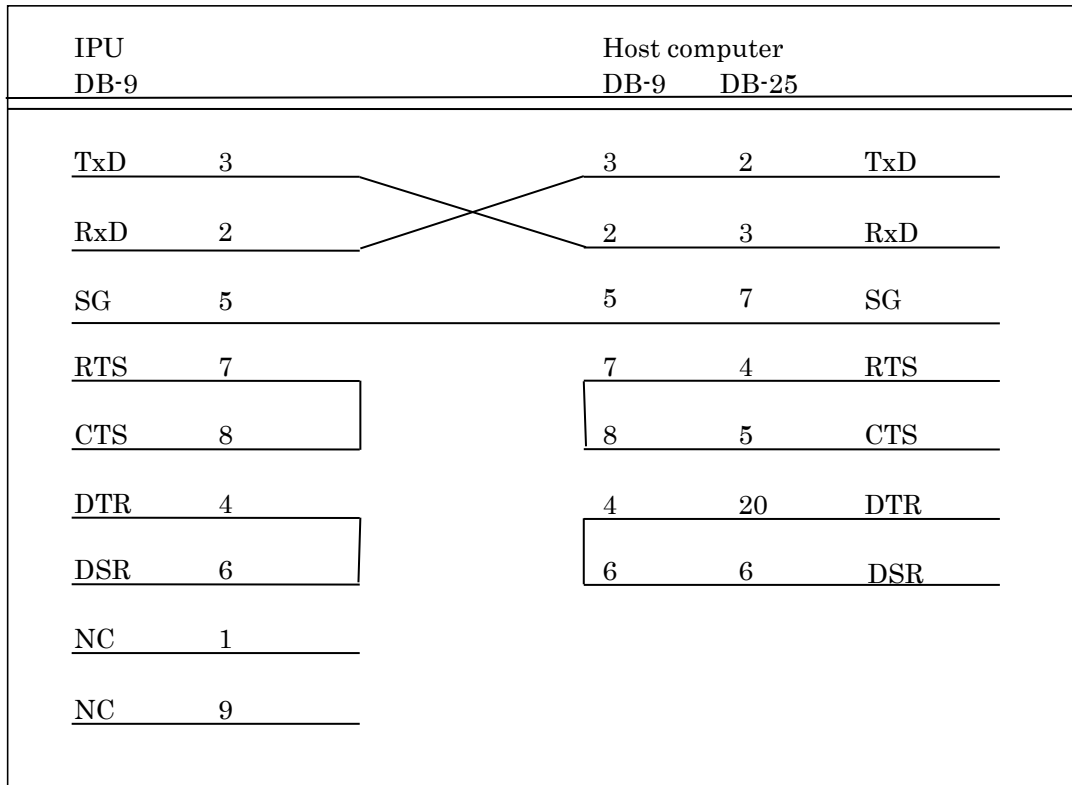
5.1.1.4. Interface parameters

Table 3: Interface parameters

Parameter	Selection of settings
Baud rate	600, 1200, 2400, 4800, *9600, 14400, 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 be used, 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 consists of the 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 the communication status both the sender and the receiver from linked status to neutral status.
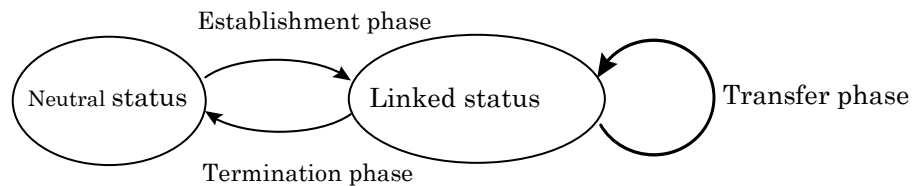
5.2.2. Establishment phase

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

```
                 Max. 15 sec.
          ┌───┐    │
          │ E │    │
          │ N │    │
 IPU      │ Q │    │
 ─────────┘   └────┼──────────
                   │  ┌───┐
                   │  │ A │
                   │  │ C │
 Host              │  │ K │
 Computer          └──┘   └──
```

```
                 Max. 15 sec.   10 sec.
          ┌───┐    │         or more │  ┌───┐
          │ E │    │                 │  │ E │
          │ N │    │                 │  │ N │
 IPU      │ Q │    │                 │  │ Q │
 ─────────┘   └────┼─────────────────┘  └────
                   │  ┌───┐
                   │  │ N │
                   │  │ A │
 Host              │  │ K │
 Computer          └──┘   └──
```
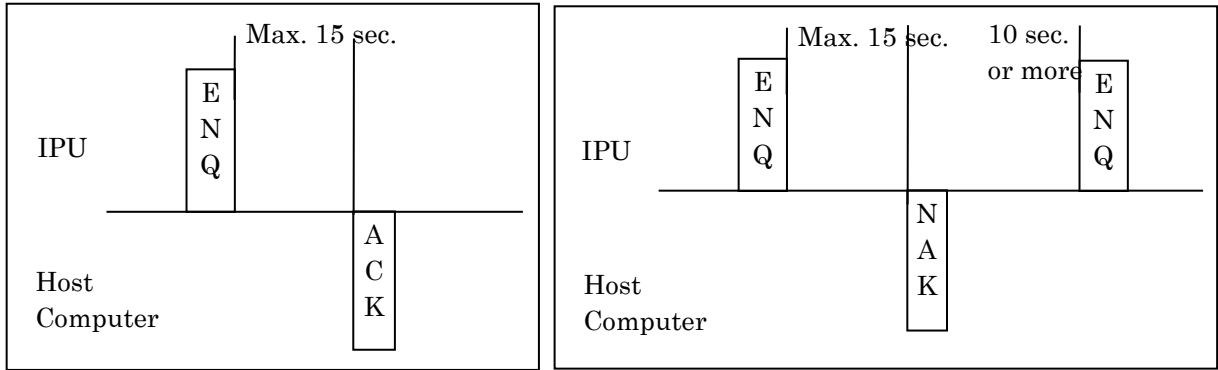
(2) When both the sender and receiver send [ENQ] signals, the host computer must yield control authority to the IPU.

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

```
                          1 sec.
                          or more │
            ┌───┐    │      ┌───┐
            │ E │    │      │ E │
            │ N │    │      │ N │
 IPU        │ Q │    │      │ Q │
 ───────────┘   └────┼──────┘   └───
                ┌───┐│
                │ E ││
 Host           │ N ││
 Computer       │ Q ││
                └───┘
```

```
                     ┌───┐
                     │ E │
                     │ N │
 IPU                 │ Q │
 ────────────────────┘   └──────────────────
                ┌───┐              ┌───┐
                │ E │              │ E │
 Host           │ N │              │ N │
 Computer       │ Q │              │ Q │
                └───┘              └───┘
                     │ 20sec. or more │
```
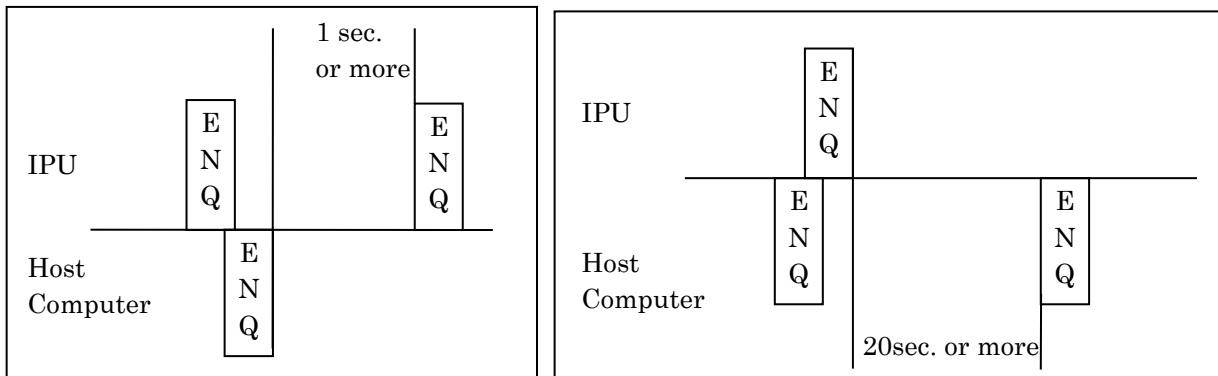
5.2.3. Transfer phase

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 "5.3 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.
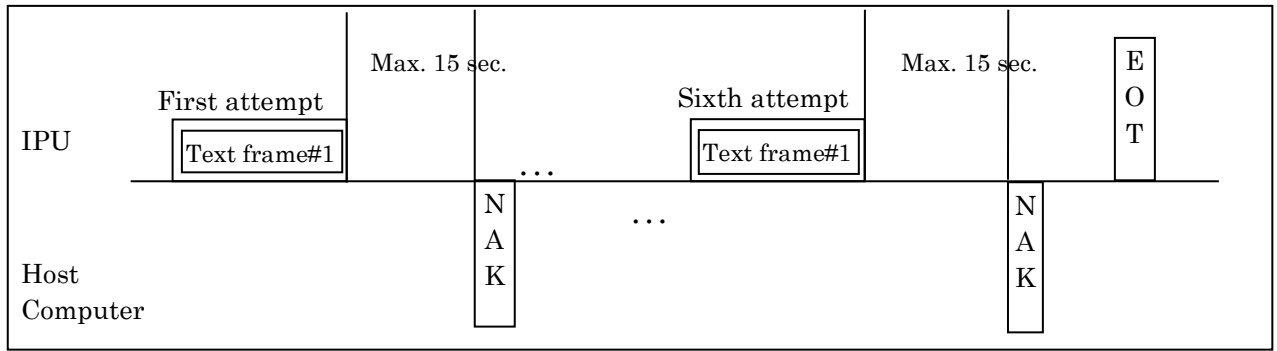
(6) The IPU processes the response of [EOT] from the Host computer as [ACK]. (Response of [EOT] from the receiver is usually a request to suspend a transmission to the sender. However, the IPU does not support this function.)

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 (with 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].
[CR] is not output at the end of the record if the setting of "Add a [CR] at the end of a record" in [System Settings]-[Host Computer]-[Detailed setting] is turned OFF. When IPU receives the record, it needs [CR] at the end of the record regardless of this setting.

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. However, the comment record can be inserted at any level. They are considered to be one lower level than the preceding record. However, a consecutive comment records are not allowed.
- 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 followings are 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.
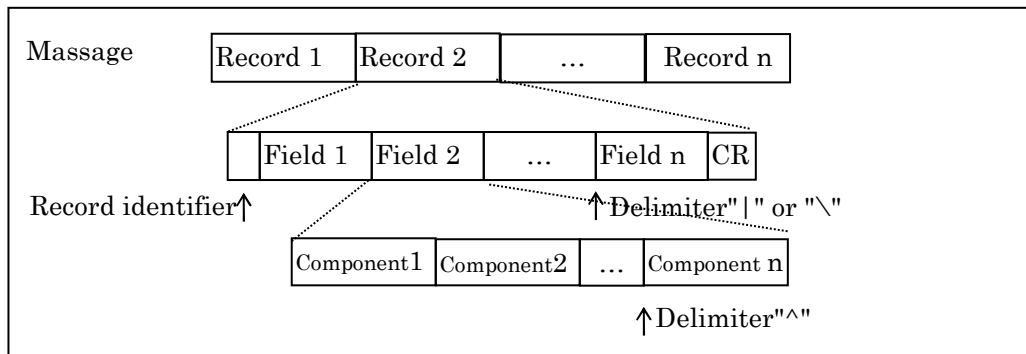
5.3.2. Communication Protocol

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

This protocol is used for CS-2500 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-2500.

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

Caution:
　　Host computer must send the "Analysis Information" in accordance with order of receiving "Analysis Order Inquiry".
　　Host computer must send "Analysis Information" within 15 seconds from receiving "Analysis Order Inquiry".
　　Host computer can never send the "Analysis Information", if it cannot send it within 15 seconds.
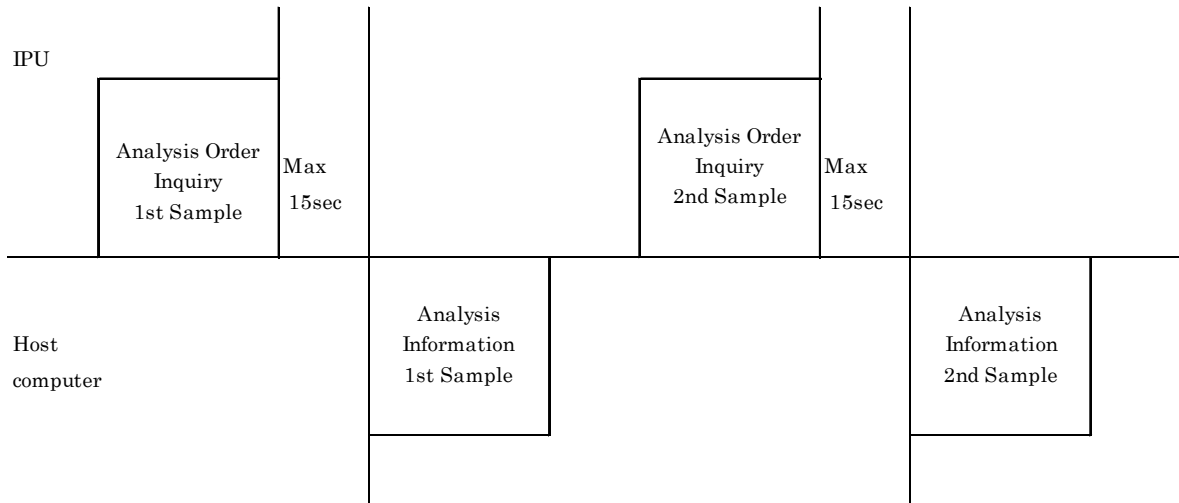
5.3.2.3. Analysis Results & QC Data (IPU-> Host computer)

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-2500^00-00^11001^^^USERINSNO^BV981798|||||||||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 (Byte)	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-2500".
   Software version: Refers to the software version loaded on the CS-2500
   Analyzer Serial No.: Analyzer serial number is output.
   Interface version: Not used
   Logical ID number: Not used
   Nickname: Analyzer nickname is output.
   PS code: "BV981798" is output .

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".

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 (Byte)	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) 8.1.5 Patient ID No.

     The patient ID is a unique patient identification and may contain a maximum of 16 digits of alpha-numeric and a hyphen "-"(2Dh).

   3) 8.1.6 Patient name

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

     Patient name is encoded/decoded to the character code shown in Table 11 depending on the IPU settings of Language.

Table 11 : Character Code

Character set	IPU "Language " Setting
ISO 8859-1	English, German, French, Italy, Spanish
Shift-JIS	Japanese
GB2312-80	Chinese
windows-1251	Russian

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 12 : Details of Request Information Record

ASTM Field	Field Name	IPU -> Host	Host -> IPU	Max. size (Byte)	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 17 : Parameter Code Lists**) 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 12	Ending request result date through User field No.2	Not used	Not used	-	
12.1.13	Requested information status code	(Inquiry type) *	Not used	(1)*	*The first analysis/ Re-analysis is selectable only when the "Inquire re-analysis"setting in the "System Settings" is ON.

[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: Consists 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
LAS sample: Describes with LXXXXX.. (X indicates a numeric character. The rack number will be fixed 6-digit number by aligning to the right and padding zeros to the most significant digits if the number is less than 6 digits.

(*) If the rack barcode is duplicated, together with a reading error, the IPU is to conduct automatic numbering as follows:
"R" + "Time 2 digits" + "Serial number 2 digits" + "*"

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.)
LAS sample: Fixed to 01.

Sample ID number: Consists 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. 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.

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 17 : 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 17 : Parameter Code Lists**.

4) 12.1.7 Beginning request result date and time

    The date format is fixed to "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) 12.1.13 Requested information status code

 Inquiry type :
    N: Real time inquiry of the first analysis
    C: Real time inquiry of re-analysis
     * Either N or C is selectable only when the "Inquire re-analysis" setting in the "System Settings" is
      ON.

Notes:
  ・ Requested information record for the C(Inquiry of re-analysis) is transmitted only when
    it satisfies the following conditions ;
  ・ The measurement mode is "Standard" mode
  ・ The "Target" of "Automatic Output" in the System Settings is "All Data"
  ・ The analysis is not QC analysis nor Calib.curve analysis
  ・ The instrument is in measurable mode.
  ・ The analysis is not multi dilution analysis(MDA).
  ・ The analysis result data including the parameters for "Re-analysis" in the assay group
    settings has been already output.

  ・ Select 9600bps or more of Baud Rate with "Ethernet connection" or "Serial connection",
    because the communication data volume increases when the "Inquire
    re-analysis" setting in the "System Settings" is ON.

Notes :
 ・ Set up auto re-analysis, auto re-dilution and reflex in the assay group settings of
  CS-2500 in the same conditions with the re-analysis logic of Host Computer, if the
  "Inquire re-analysis" is selected (because aspiration volume increases with the
  re-analysis).
 ・ Please be noted that the analysis settings are different from those with no inquiry of
  re-analysis in the following conditions ;
    Same parameters with the parameters used for the first analysis are selected as the
    reflex test parameters.

Re-analysis is not performed when the CS-2500 condition is used (that does not inquire
re-analysis). If the analysis is performed by the order of Host Computer, the error
"Insufficient Sample" might occur.

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 13 : 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(^^Measurement Mode)*	6^ 2^ 15^ 1(^^1) *	Sample ID No. attribute is one of the followings: M: Manual entry A: Automatically assigned by analyzer
9.4.4	Instrument specimen ID	Rack No.^ Tube Position^ Sample ID No.^ Sample ID No. attribute^ Extended order request flag(^Measurement Mode)*	Not used	6^ 2^ 15^ 1^ 1(^1)*	B: Barcode reader *Measurement Mode can be set only when "System Settings"-"Specify Measurement Mode" setting is ON.
9.4.5	Universal Test ID	Not used	^^^Test code ^^Dilution ratio^Option(^Replication)* (^Measurement Time)* 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 (^1)* (^1)*	*Replication can be set only when "System Settings"-"Specify Replication" setting is ON. *Measurement Time can be set only when "System Settings"-"Switch Measurement Time" setting is ON.
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

ASTM Field	Field name	IPU-> Host computer	Host computer -> IPU	Max. size (Byte)	Remarks
9.4.13 - 9.4.31	Danger code through Material institution	Not used	Not used	-	

[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: Consists 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.

Measurement Mode: Specifies sampling mode.
N: Normal Mode
M: Micro-sampling Mode
Other than above value: Sample is aspirated according to the instrument setting.

In the case of QC sample, it is not possible to specify measurement mode from Host Computer. Specified measurement mode from Host Computer is not reflected to QC sample.

If the measurement mode is changed from Assay Group setting on the instrument (manual order registration or preset order), the sample is aspirated according to the specified setting from the instrument prior to Host Computer specification.

*Measurement Mode can be set only when "System Settings"-"Specify Measurement Mode" setting is ON.

> Note :
> When the"Inquire re-analysis"setting in the "System settings"is ON and the test order record is for the inquiry of re-analysis, it is impossible to specify Micro-sampling mode. (The mode is not reflected.)

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

(*) If the rack barcode is duplicated, together with a reading error, the IPU is to conduct automatic numbering as follows:
"R" + "Time 2 digits" + "Serial number 2 digits" + "*"

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.)

Sample ID number: Consists 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.)

> Note: For QC orders, "QCXXXXXXXYYYYYY" is automatically generated as a sample number.
> The selected control name is displayed in XXXXXXX by seven alphameric characters aligned to the right. If the control name exceeds seven characters, only the first seven will be displayed. If it is less than seven characters, the text is aligned to the right and displayed by space padding.
> The selected control lot number is displayed in YYYYYY by six alphameric characters aligned to the right. If the lot number is less than six characters, the text is aligned to the right and displayed by space padding.

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.

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.

> Note:
> The flag is not output if the"Inquire re-analysis"setting in the"System Settings"is ON.

Measurement Mode: Indicates sampling mode.
N: Normal Mode
M: Micro-sampling Mode

*Measurement Mode can be set only when "System Settings"-"Specify Measurement Mode" setting is ON.

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 17 : 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-2500 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-2500 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.**

> 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 combination 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

Replication: Sets the number of times the test is performed. "1" or "2" can be set.
Other than above value: Sample is measured according to instrument setting.

In the case of QC sample, it is not possible to specify the replication from Host Computer. Specified replication from Host Computer is not reflected to QC sample.

*Replication can be set only when "System Settings"-"Specify Replication" setting is ON.

> Note:
> When the"Inquire re-analysis"setting in the "System settings"is ON and the test order record is for inquiry of re-analysis, it is impossible to specify replication. (Measurement is performed according to the replication set at the assay group settings of CS-2500.)

Measurement Time: Set measurement time. If there are no settings, follow the instrument settings.
        M : Measurement Time(Main)
        S : Measurement Time(Sub)

      * This is selectable only when the"Switch Measurement Time"in the"System Settings" is ON. Default setting is OFF.

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 to "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).

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|||||20110328135056<CR>
  R|2|^^^042^PT %^100.00^9^^^| 99.4|%||N|||||20110328135056<<CR>
  ……
- Host computer -> IPU
  Not used

Table 14 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(^Replication)*	Not used	^^^3^ 24^6^ 1^ 1 ^1^1(^2) *	Test code: Described in Test code (**Table 17 : Parameter Code Lists**) : Parameter: Up to 24 characters *Replication can be output only when "System Settings"-"Specify Replication" setting is ON.
10.1.4	Data or measurement value	Value	Not used	6	Up to 6 characters (In case of the path name to the image data, up to 80 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	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	(Result Status)*	Not used	(1)*	*Result Status can be output only when "Output each Assay Group result" setting is ON.
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	YYYYMMDDH HMMSS	Not used	14	

ASTM Field	Field name	IPU -> Host computer	Host computer -> IPU	Max. size (Byte)	Remarks
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.
                                Consists of the combination of "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 18 : 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 14 Details of the Result record** .

    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.

    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)

    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

    Extended order results: Indicates the analysis result is one of the followings: the result of the redilution analysis, 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

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

> Note :
> The extended order and reflex test request are not output when the"Inquire re-analysis" setting in the "System Settings"is ON.

Replication: Indicates the number of times the test is performed.
*Replication can be set only when "System Settings"-"Specify Replication" setting is ON. Default setting is OFF.

b) 10.1.4 Data or measurement value

Up to 6-digit number. Data format is described in the **Table 18 : 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-2500, the units set in the IPU are output. (The ASTM describes the abbreviation of ISO standard should be used.) See the **Table 18 : Parameter Code Lists(Result)** . If the unit is "Ratio" or "INR", they are not output.

d) 10.1.7 Result abnormal flag

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

    * Appendix.C - Table 19. Analysis error, Result Abnormal Flags, and Display method of analysis results

Evaluation Information

Outputs a string of characters consisting of the combination of the evaluation error code and error message, which is enclosed between square brackets "[]". 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. See the Table 19 (Appendix C).

Instrument Error Information

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

    If there is no Instrument 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. See the Table 19 (Appendix C).

> Note：
>
> Evaluation Information and Instrument Error Information are encoded to Character Code according to the setting of displaying language on IPU for output to Host Computer. The relation of Character Code and display language setting is shown in Table 11.

e) 10.1.9 Result Status

    Indicates the status of analysis result.

    S:

    Indicates the result is the part of the analysis results for the sample.

    The analysis result is output when the analysis for one Assay Group is end.

    F:

    Indicates the result is all analysis results for the sample.

    The analysis result is output when the all analysis for the sample is end.

> (Caution) Validate the output result of each Assay Group with analysis result of other Assay Group on the Host Computer.

    *Result Status can be output only when "Output each Assay Group result" setting is ON.

f) 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).

    This date and time indicates when the all tests of the sample are completed.

    In the case of the result which is one of the sample(the analysis result with 10.1.9 Result Status is "S") , this field is blank.

2.2) When Sample Info. flags are output: The parameters to which HIL flags or Sample Volume flag are attached are output.

    Sample info flags are out put with defective sample volume flag "N" even if the sample volume is within the specified range, when the setting of "Output Sample Volume flags only in case of defective sample volume." is turned OFF in [System Settings].

> (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, or sample volume flags

                                      Hemolytic Sample: Sample suspected of having hemolysis.

                                      Icterus Sample: Sample suspected of having icterus.

                                      Lipemic Sample: Turbid sample affected by lipemia or other materials.

                                      Defective Sample Volume: Sample suspected of defective sample 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 volume flags.

    W: Above the analysis range of the HIL detector (Not used for sample volume flags)

    N: Sample Volume check fell within the preset range (Not used for HIL flags)

e) 10.1.9 Result Status

    Indicates the status of analysis result.

    S:

     Indicates the result is the part of the analysis results for the sample.

     The analysis result is output when the analysis for one Assay Group is end.

    F:

     Indicates the result is all analysis results for the sample.

     The analysis result is output when the all analysis for the sample is end.

    *Result Status can be output only when "Output each Assay Group result" setting is ON.

f) 10.1.13 Date /time test completed

    Indicates the date and time the test was completed.

    The date format is fixed to "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).

2.3) The path name to the image data is output only when the parameters have the image data.

(Caution)
The image data is used for a testing at a clinical laboratory only and not for examination of a patient. It is to let the operators know a potential specific abnormality in a sample confirmed by the analysis data.

---

a) 10.1.3 Universal Test ID
   Test Code   : Assay Group Code is set.
   Parameter   : Type of the image data is set.
         Normal   : Normal Clot Waveform
         Average : Average Clot Waveform
         MDA   : MDA image data
         Mixing   : Cross mixing image data
         Delayed Mixing   : Delayed Cross mixing image data
   Dilution ratio :   Not used
   Type of Analysis Results : Not used
   Extended order request : Not used
   Extended order result : Not used
   Reflex test request : Not used

b) 10.1.4 Data or measurement values
   The file path name to the image data is output. The character "\" used for the file path is converted to the escape sequence "&R&". The actual image data is written to the"C:\shared\PNG\Date folder". The file path name is output after the"PNG"to the data value. The date folder is fixed as"YYYYMMDD". The file name is attached depending on the date and time (fixed as"YYYYMMDDHHMM") at measurement start, sample No., test code, image data, dilution ratio_test sequence No. and the type of extended order results.

Table 15 : List of the information included in the file

No.	Item	Contents	Remarks
1	Test Date	Sets the analyzed date (and time) in the form of "YYYY_MM_DD_HH_MM"	Date/Time test started
2	Sample No.	Sets the Sample No.	
3	Test Code	Sets the test code set in the request record.	

4	Type of image data	Sets the type of image data.
		   Normal : Normal Clot Waveform
		   Average : Average Clot Waveform
		   MDA : MDA image data
		   Mixing : Cross mixing image data
		   Delayed Mixing : Delayed Cross mixing image data	

5	Dilution Ratio	Sets dilution ratio.	This is skipped when the types of image data are other than Normal and Average.
6	Test Sequence No.	Sets the sequence No. during analysis.	This is skipped when the types of image data are other than Normal.

7	Extended order	Sets the information to identify whether the result is re-analysis result or not. (Optional)
		   D : Result of re-dilution analysis
		   R : Result of re-analysis
		   F : Result of reflex test
			This is skipped when the types of image data are other than Normal.

"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_100_1.Png"

In this case, the image data is saved in the "C:\shared\PNG\20030930"folder with the file name of"2003_09_30_12_00_1234567890_040_Normal_100_1. Png"

If the folders saving the image data have passed 3 days including the day the IPU starts up, they are deleted when the IPU is started.

ex1） Twice analyses
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_100_1. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_100_2. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Average. Png "

ex2） MDA analysis
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_050_1. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_025_1. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_013_1. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_MDA. Png "

ex3） Re-analysis
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_100_1. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_100_1_R. Png "

ex4） Twice analyses + Re-dilution analysis
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_100_1. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_100_2. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Average. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_050_1_D. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Normal_050_2_D. Png "
"PNG&R&20130930&R&2013_09_30_12_00_1234567890_040_Average_D. Png "

c） 10.1.5 Units
Not used

d） 10.1.7 Result abnormal flag
Not used

e) 10.1.13 Date/time test completed
The date format is fixed to "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)

Output of Delayed Cross mixing image data

The delayed cross mixing image can be output to host computer manually. In case, the IPU sends Cross mixing analysis information in CSV file format as well as PNG file. The CSV file is written to the "C:\shared\CSV\Date folder".

10.1.4 Data or measurement values
   The file path name to the image data is output.
   The file path name is output after the "CSV" to the data value.
   The file name conforms Table 15.

The contents of CSV file;

Item	Contents	Remarks
Sample No	Sample No.	
Date/Time	The analyzed date and time.	YYYY/MM/DD hh:mm:ss
Assay Group	The test code set in the request record. (see in Table 18 of App.B)	
Sample Comment	Sample No.	MAX 30 characters.
Mixing Ratio	Mixing Ratio.	
Immediate Type	Result data of Immediate type in each mixing ratio.	Result data are specified with including 1-digit of decimal number.
Delayed Type	Result data of Delayed type in each mixing ratio.	Result data are specified with including 1-digit of decimal number.
Reference Info.	Title of Reference Info.	
Value	Value of Reference Info.	Values of Reference Info. are specified with including 1-digit of decimal number.

The format of CSV file;

Object	Format
Character Code	UTF-8
Control code	<CR><LF>
Header Line	Output
Delimiter	Comma
Data output	Double quote

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 16 : 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

Examples of Communication are given for the cases when the serial connection (ASTM E1381-02 Mode) is carried out

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-2500^01-68^10000001^^^CS-2500^BV981798||||||||E1394-97 <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|20110328133318<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

6.2. Inquiry of Re-analysis Order (IPU=>Host)

* When the"Inquire Re-anaysis"setting in the "System Setting"is ON

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798||||||||E1394-97 <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|20110328133318||||||C<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

6.3. 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|20110330123159|||||N||||||||||||||||||||||<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>4L|1|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<EOT>

6.3.1. Specify Replication

*When "System Settings"-"Specify Replication" setting is ON.

Host	<ENQ>
IPU	<ACK>
Host	<STX>1H|\^&||||||||||||E1394-97|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>2P|1|||100|^Heisei^Jiro||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^2\^^^050^^100.00^^1\^^^060^^100.00^^1\^^^040^^100.00^DR^2|R|20110330123159|||||N|||||||||||||||||||||<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>4L|1|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<EOT>

6.3.2. Specify Measurement Mode

*When "System Settings"-"Specify Measurement Mode" setting is ON.

Host	<ENQ>
IPU	<ACK>
Host	<STX>1H|\^&||||||||||||E1394-97|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>2P|1|||100|^Heisei^Jiro||20010820|M|||||^Dr.2||||||||||||||^^^EAST|||||||||<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>3O|1|000001^01^ 1^B^^M||^^^040^^100.00^DF\^^^050^^100.00\^^^060^^100.00\^^^040^^100.00^DR|R|20110330123159|||||N|||||||||||||||||||||<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>4L|1|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<EOT>

6.3.3. Specify Measurement Time

*3 When the"Switch Measurement Time"setting in the"System Settings"is ON.

Host	<ENQ>
IPU	<ACK>
Host	<STX>1H|\^&||||||||||||E1394-97|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>2P|1|||100|^Heisei^Jiro||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^^S\^^^050^^100.00^^^M\^^^060^^100.00^^^S\^^^040^^100.00^DR^^S|R|20110330123159|||||N|||||||||||||||||||||<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<STX>4L|1|<CR><ETX><CHK1><CHK2><CR><LF>
IPU	<ACK>
Host	<EOT>

6.4. Analysis Results (IPU => Host Computer)

6.4.1. When analysis is performed 1 time

IPU	<ENQ>
Host	<ACK>

IPU	`<STX>1H|\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798|||||||||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|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>5R|2|^^^042^PT %^100.00^9^^^|` `99.4|%||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>6R|3|^^^043^PT R.^100.00^9^^^|` `0.57|||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>7R|4|^^^044^PT INR^100.00^9^^^|` `0.81|||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>0R|5|^^^051^APTT sec^100.00^9^^^|` `27.4|sec||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>1R|6|^^^061^Fbg sec^100.00^9^^^|` `8.5|sec||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>2R|7|^^^062^Fbg C.^100.00^9^^^|` `588.2|mg/dL||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>3R|8|^^^^Hemolytic` `Sample^^^^^|||||A|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>4R|9|^^^^Defective Sample` `Volume^^^^^|||||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>5L|1|N<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<EOT>`

* When the"Inquire re-anaysis"setting in the"System Settings"is ON
<6.4.2 "Transmitting Analysis Results (The first analysis)"is also the same.>

IPU	`<ENQ>`
Host	`<ACK>`
IPU	`<STX>1H|\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798|||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>2P|1|||||^Heisei^Jiro<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^^^|` `10.2|sec||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>5R|2|^^^042^PT %^100.00^1^^^|` `99.4|%||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>6R|3|^^^043^PT R.^100.00^1^^^|` `0.57|||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`
IPU	`<STX>7R|4|^^^044^PT INR^100.00^1^^^|` `0.81|||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>`
Host	`<ACK>`

IPU	<STX>0R|5|^^^051^APTT sec^100.00^1^^^| 27.4|sec||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^1^^^| 8.5|sec||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^1^^^| 588.2|mg/dL||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3R|8|^^^^Hemolytic Sample^^^^^||||A|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|9|^^^^Defective Sample Volume^^^^^||||N|||||||20110328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

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

・ Transmitting Analysis Results (The first analysis)

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798||||||||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|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^1^R^^| 99.4|%||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^1^R^^| 0.57|||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^1^R^^| 0.81|||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^1^^^| 27.4|sec||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^1^^^| 8.5|sec||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^1^^^| 588.2|mg/dL||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3R|8|^^^^Icterus Sample^^^^^||||W|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|9|^^^^Lipemic Sample^^^^^||||A|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|10|^^^^Defective Sample Volume^^^^^||||A|||||||20110328135407<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-2500^01-68^10000001^^^CS-2500^BV981798|||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1|||||^Heisei^Jiro<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|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^3^^R^| 99.4|%||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^3^^R^| 0.57|||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^3^^R^| 0.81|||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^^Icterus Sample^^^^^|||||W|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^^Lipemic Sample^^^^^||||A|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^^Defective Sample Volume^^^^^|||||A|||||||20110328135407<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-2500^01-68^10000001^^^CS-2500^BV981798|||||||||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|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^9^^R| 99.4|%||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^9^^R| 0.57|||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^9^^R|

IPU	0.81|||N||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^9^^^| 27.4|sec||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^9^^^| 8.5|sec||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^9^^^| 588.2|mg/dL||N|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3R|8|^^^^Icterus Sample^^^^^||||W|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>4R|9|^^^^Lipemic Sample^^^^^||||A|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|9|^^^^ Defective Sample Volume^^^^^||||A|||||||20110328135407<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

6.4.3. When analysis is performed 2 times

Example: Analysis result (The first analysis)

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798|||||||||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|||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^1^^^| 99.4|%||N|||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^1^^^| 0.57|||N|||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^1^^^| 0.81|||N|||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^1^^^| 27.4|sec||N|||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^1^^^| 7.9|sec||N|||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^1^^^| 632.9|mg/dL||N|||||||20110328150948<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-2500^01-68^10000001^^^CS-2500^BV981798|||||||||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||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^062^Fbg C.^100.00^1^^^| 632.9|mg/dL||N||||||20110328150948<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-2500^01-68^10000001^^^CS-2500^BV981798|||||||||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||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^9^^^| 99.4|%||N||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^9^^^| 0.57|||N||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^9^^^| 0.81|||N||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0R|5|^^^051^APTT sec^100.00^9^^^| 27.4|sec||N||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>1R|6|^^^061^Fbg sec^100.00^9^^^| 7.9|sec||N||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2R|7|^^^062^Fbg C.^100.00^9^^^| 632.9|mg/dL||N||||||20110328150948<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>3L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

6.4.4. Output analysis result for each Assay Group

   *When "Output each Assay Group result" setting is ON,

PT

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798|||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1|||||^Heisei^Jiro<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||S||||<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^042^PT %^100.00^9^R^^| 99.4|%||N||S||||<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^043^PT R.^100.00^9^R^^| 0.57|||N||S||||<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7R|4|^^^044^PT INR^100.00^9^R^^| 0.81|||N||S||||<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>0L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

APTT

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798|||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1|||||^Heisei^Jiro<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|^^^051^APTT sec^100.00^9^^^| 27.4|sec||N||S||||<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

Fbg

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798|||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1|||||^Heisei^Jiro<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|^^^061^Fbg sec^100.00^9^^^| 8.5|sec||N||S||||<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>

IPU	\<STX>5R|2|^^^062^Fbg C.^100.00^9^^^|
	588.2|mg/dL||N||S||||\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>6L|1|N\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<EOT>

All Assay Groups

IPU	\<ENQ>
Host	\<ACK>
IPU	\<STX>1H|\\^&|||CS-2500^01-68^10000001^^^CS-2500^BV981798|||||||||E1394-97\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>2P|1|||||^Heisei^Jiro\<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||F||||20110328135407\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>5R|2|^^^042^PT %^100.00^9^R^^|
	99.4|%||N||F||||20110328135407\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>6R|3|^^^043^PT R.^100.00^9^R^^|
	0.57|||N||F||||20110328135407\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>7R|4|^^^044^PT INR^100.00^9^R^^|
	0.81|||N||F||||20110328135407\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>0R|5|^^^051^APTT sec^100.00^9^^^|
	27.4|sec||N||F||||20110328135407\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>1R|6|^^^061^Fbg sec^100.00^9^^^|
	8.5|sec||N||F||||20110328135407\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>2R|7|^^^062^Fbg C.^100.00^9^^^|
	588.2|mg/dL||N||F||||20110328135407\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>3L|1|N\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<EOT>

6.4.5. Output the path name to the image data

IPU	\<ENQ>
Host	\<ACK>
IPU	\<STX>1H|\\^&|||CS-2500^00-17^10000001^^^CS-2500^BV981798|||||||||E1394-97\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>2P|1|||||^Heisei^Jiro\<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||||||20150328135056\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>5R|2|^^^041^Normal|PNG&R&20150328&R&2015_03_28_13_50_56_000001_041_Normal
	_100_1.PNG||||||||||20150328135056\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>
IPU	\<STX>6L|1|N\<ETX>\<CHK1>\<CHK2>\<CR>\<LF>
Host	\<ACK>

IPU	<EOT>

6.4.6. Output the path name to the Delayed cross mixing image data

IPU	<ENQ>
Host	<ACK>
IPU	<STX>1H|\\^&|||CS-2500^00-17^10000001^^^CS-2500^BV981798|||||||||E1394-97<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>2P|1|||||^Heisei^Jiro<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|^^^051^APTT sec^100.00^A^^^| 10.2|sec||N||||||20150328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>5R|2|^^^050^DelayedMixing|PNG&R&20150328&R&2015_03_28_13_50_56_000001_050 _DelayedMixing_100_1.PNG||||||||||20150328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>6R|3|^^^050^DelayedMixing|CSV&R&20150328&R&2015_03_28_13_50_56_000001_050 _DelayedMixing_100_1.CSV|||||||||||20150328135056<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<STX>7L|1|N<ETX><CHK1><CHK2><CR><LF>
Host	<ACK>
IPU	<EOT>

7. Appendix

A. TCP/IP communication

A.1   Software

1) Data link/ Network/ Transport layer

The IP address of the IPU for the CS-2500 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-2500. 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-2500 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.

B. Parameter Code List

Table 17 : Parameter Code Lists

Assay Group	Parameter Code	Assay Group	Parameter Code
PT	04X	Reserved	50X
APTT	05X	TT	51X
Fbg	06X	Reserved	52X
Reserved	07X	Reserved	53X
Reserved	08X	Reserved	54X
Reserved	09X	Reserved	55X
Reserved	10X	Reserved	56X
II	12X	Reserved	57X
V	15X	Reserved	58X
VII	17X	Reserved	60X
VIII	18X	DDimer	61X
IX	19X	Reserved	63X
X	20X	Reserved	64X
XI	21X	Reserved	65X
XII	22X	Reserved	66X
PCcl	25X	Reserved	67X
BXT	26X	Reserved	68X
LA1	27X	Reserved	70X
LA2	28X	Reserved	71X
Reserved	29X	Reserved	72X
AT3	30X	Reserved	80X
APL	31X	Reserved	81X
Plg	32X	Reserved	82X
PC(Chrom)	33X	Reserved	83X
Hep	34X	FVL R	84X
Reserved	36X	FVL Act	85X
Reserved	37X	FVL OVB	86X
VIII ch	39X	Reserved	87X
Reserved	40X	Reserved	88X
LA R	41X	Reserved	89X
Reserved	42X	Reserved	90X
Reserved	43X	INN FPS	91X
Reserved	44X	Reserved	92X
Reserved	45X	Reserved	000
Reserved	46X	Reserved	999
Reserved	47X		

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

If there is no information for the inquired sample, host computer sends either the parameter code "999". or "000" Once IPU receives "999" from the host computer, IPU displays "There is no order in Host Computer" (error code: 21009). Once IPU receives "000" sample is skipped without generating an error code.
Then, the analysis of the sample is skipped. The rest of the analysis operation continues, and sample inquiry re-starts from the next 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 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: INR

Table 18 : Parameter Code Lists(Result)

Test code	Test name	Units	Format	Test code	Test name	Units	Format
041	PT sec	sec	####.#	392	VIII ch %	%	####.#
042	Reserved			40X	Reserved		
043	PT INR		###.##	411	LA R		###.##
044	Reserved			42X	Reserved		
051	APTT sec	sec	####.#	43X	Reserved		
061	Fbg sec	sec	####.#	44X	Reserved		
062	Fbg C.	mg/dL	###	45X	Reserved		
07X	Reserved			46X	Reserved		
08X	Reserved			47X	Reserved		
09X	Reserved			50X	Reserved		
10X	Reserved			511	TT sec	sec	####.#
121	II sec	sec	####.#	52X	Reserved		
122	II %	%	####.#	53X	Reserved		
151	V sec	sec	####.#	54X	Reserved		
152	V %	%	####.#	55X	Reserved		
171	VII sec	sec	####.#	56X	Reserved		
172	VII %	%	####.#	57X	Reserved		
181	VIII sec	sec	####.#	58X	Reserved		
182	VIII %	%	####.#	60X	Reserved		
191	IX sec	sec	####.#	611	INN DD dOD	dOD	##.###
192	IX %	%	####.#	612	INN DD C.	mg/L	###.##
201	X sec	sec	####.#	63X	Reserved		
202	X %	%	####.#	64X	Reserved		
211	XI sec	sec	####.#	65X	Reserved		
212	XI %	%	####.#	66X	Reserved		
221	XII sec	sec	####.#	67X	Reserved		
222	XII %	%	####.#	68X	Reserved		
251	PC cl sec	sec	####.#	70X	Reserved		
252	PC cl %	%	####.#	71X	Reserved		
261	BXT	sec	####.#	72X	Reserved		
271	LA1 sec	sec	####.#	80X	Reserved		
281	LA2 sec	sec	####.#	81X	Reserved		
29X	Reserved			82X	Reserved		
301	AT3 dOD	dOD	##.###	83X	Reserved		
302	AT3 %	%	####.#	841	FVL R		###.##
311	APL dOD	dOD	##.###	851	FVL Act sec	sec	####.#
312	APL %	%	####.#	861	FVL OVB sec	sec	####.#
321	Plg dOD	dOD	##.###	87X	Reserved		
322	Plg %	%	####.#	88X	Reserved		
331	PC dOD	dOD	##.###	89X	Reserved		
332	PC %	%	####.#	90X	Reserved		
341	Hep dOD	dOD	##.###	911	INN FPS dOD	dOD	#.####
342	Hep C.	IU/mL	###.##	912	INN FPS %	%	####.#
36X	Reserved			92X	Reserved		
37X	Reserved			000	Reserved		
391	VIII ch dOD	dOD	#.####	999	Reserved		

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

C. Error Information

Table 19 : 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.

*2 When"HILCheck Settings" of System Settings is set to "Output numeric values".

*3 When"HILCheck Settings" of System Settings is set to "Output values with low-reliability flags".

*4 When"HILCheck Settings" of System Settings is set to "Output masked values".

Code	Message	Result abnormal flag	Display method of analysis results	
			"Output Error Information" is OFF	"Output Error Information" is 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
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
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]

Code	Message	Result abnormal flag	Display method of analysis results	
			"Output Error Information" is OFF	"Output Error Information" is ON
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
1000.1000.0000	［Hemolyzed Sample］	N*2	Numeric values are output*2	Numeric values are output*2
		A*3	Numeric values are output*3	Numeric values are output*3
		A*4	Masked values are output*4	Masked values are output*4
1000.2000.0000	［Icteric Sample］	N*2	Numeric values are output*2	Numeric values are output*2
		A*3	Numeric values are output*3	Numeric values are output*3
		A*4	Masked values are output*4	Masked values are output*4
1000.3000.0000	［Lipemic Sample］	N*2	Numeric values are output*2	Numeric values are output*2
		A*3	Numeric values are output*3	Numeric values are output*3
		A*4	Masked values are output*4	Masked values are output*4
1100.4000.0000	［Defective Sample Volume］	N	Numeric values are output	Numeric 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
4032.0000.0000	［Bump］	A	Masked values are output	Masked values are output
4128.0000.0000	［No Polynomialadjustment］	A	Masked values are output	Masked values are output

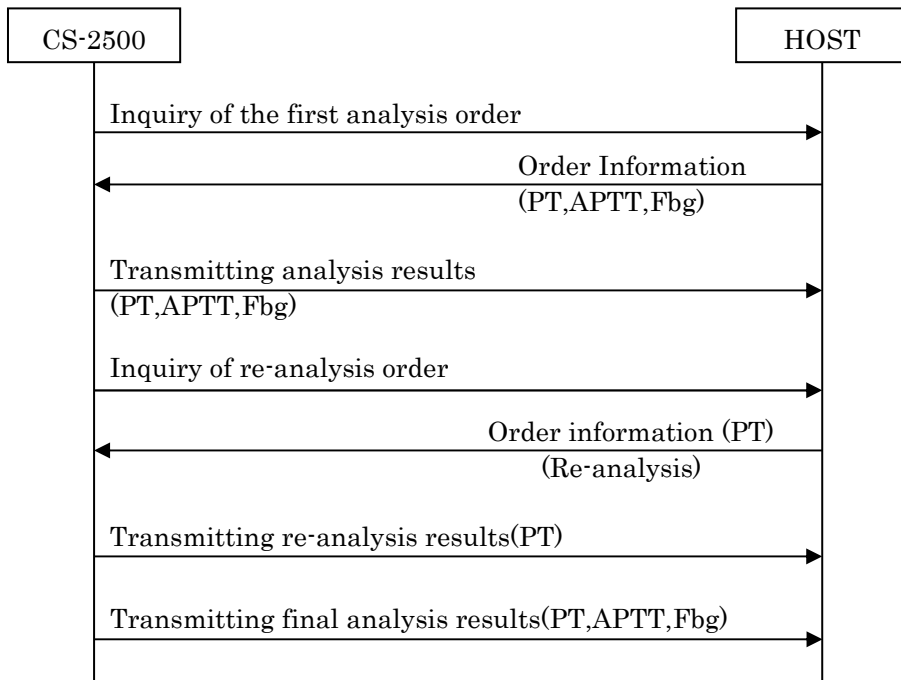| Code	Message	Result abnormal flag	Display method of analysis results	
			"Output Error Information" is OFF	"Output Error Information" is ON
4256.0000.0000	［Range in non-linear］	A	Masked values are output	Masked values are output
9999.0000.0000	［Measurement Failure］	A	Masked values are output	Masked 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
9999.0000.9110	［TEST_REAGENTLOT_ERROR］	N	Masked values are output	Masked values are output
Unknown9999	［Unknown Message］	N	Numeric values are output	Numeric values are output

D. Re-analysis order

The sample flow of communication sequence and simulation results for the"Inquiry of Analysis Order"and the "Analysis Order" when the "Inquire re-analysis" setting in the "System Settings" is ON is shown as follows;
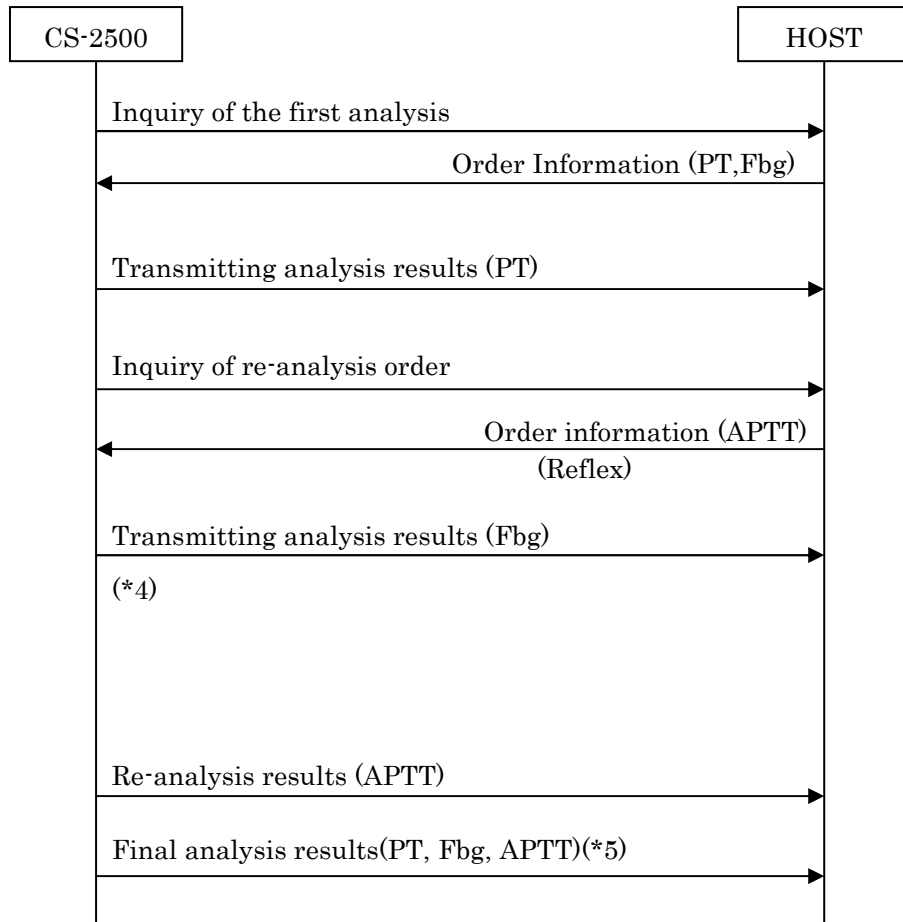
D.1 There is no re-analysis order (Batch transmission):

```
   ┌─────────┐                                    ┌─────────┐
   │ CS-2500 │                                    │  HOST   │
   └────┬────┘                                    └────┬────┘
        │  Inquiry of the first analysis order         │
        │─────────────────────────────────────────────▶│
        │              Order Information                │
        │◀─────────────────────────────────────────────│
        │                                               │
       ┌│  Transmitting analysis results (PT,APTT,Fbg)  │
       ││─────────────────────────────────────────────▶│
 Restricted│                              Stand-by time(*1)│
transmission│  Inquiry of re-analysis order             │
   (*3) │ │─────────────────────────────────────────────▶│
       │ │      No re-analysis order information (*2)    │
       └ │◀─────────────────────────────────────────────│
        │  Transmitting final analysis results(PT,APTT,Fbg)│
        │─────────────────────────────────────────────▶│
        │                                               │
```

D.2 There is a re-analysis order (Batch transmission):

```
   ┌─────────┐                                    ┌─────────┐
   │ CS-2500 │                                    │  HOST   │
   └────┬────┘                                    └────┬────┘
        │  Inquiry of the first analysis order         │
        │─────────────────────────────────────────────▶│
        │              Order Information                │
        │                 (PT,APTT,Fbg)                 │
        │◀─────────────────────────────────────────────│
        │  Transmitting analysis results                │
        │  (PT,APTT,Fbg)                                │
        │─────────────────────────────────────────────▶│
        │  Inquiry of re-analysis order                 │
        │─────────────────────────────────────────────▶│
        │            Order information (PT)             │
        │                (Re-analysis)                  │
        │◀─────────────────────────────────────────────│
        │  Transmitting re-analysis results(PT)         │
        │─────────────────────────────────────────────▶│
        │  Transmitting final analysis results(PT,APTT,Fbg)│
        │─────────────────────────────────────────────▶│
        │                                               │
```

D.3 There is a re-analysis order (For each assay group):

CS-2500	HOST

Inquiry of the first analysis →

← Order Information (PT,Fbg)

Transmitting analysis results (PT) →

Inquiry of re-analysis order →

← Order information (APTT)
(Reflex)

Transmitting analysis results (Fbg) →

(*4)

Re-analysis results (APTT) →

Final analysis results(PT, Fbg, APTT)(*5) →

(*1) Stand-by time: Analysis results and Inquiry of re-analysis order.　Default (System settings):1 sec
(*2) No re-analysis order information: Please return"000"for the test code, if the HOST judges "do no perform re-analysis" for the inquiry of re-analysis order.
(*3) Restricted transmission: No other transmission can interrupt during the period.
(*4) No Inquiry : If the "Fbg" is not targeted for re-analysis, the inquiry of re-analysis order is not performed.
(*5) Final analysis results : When the "Output each Assay Group result" setting of the "System Settings" is ON and the "Output the final result" setting is OFF, the final analysis results are not transmitted.

End of Document