AU5800

Online LAN Specification

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BECKMAN COULTER

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This specification is subject to change without notice. To connect the equipment, consult the Beckman Coulter Technical Support.

1. Introduction

This specification describes the specification to connect the automated analyzer, AU5800 (the equipment hereafter) and the external data processing device (Host hereafter) by TCP/IP communication.

ASTM E1394-91 Standard is used in this specification. And for those functions which cannot be conducted by ASTM E1394-91, the concept of HL7 is adopted.

Although this specification is common to all the AU series, only the models with differences in functions are shown below.

○: With function, ×: Without function

	Equipment		
	AU680	AU480	AU5800
STAT	○	○	×
HbA1c Test	○	○	×
Unit / Cuvette	×	×	○ *1
LIH Detailed Data Output	×	×	○ *2
Identification per sample type by Host when Automation Ready is connected	×	×	○ *3

*1: For the details, refer to 7.4.2. Realtime Result Transfer (2) Result Message.

*2: For the dtails, refer to 7.5. Message Common Fields R.10.1.4 Result (1) Result format B.LIH data.

*3: For the details, refer to the followings.

- 7.5. Message Common Fields Q.12.1.3 Test requisition query start number By Analysis Type/By sample kind/Sample No.
- 7.5. Message Common Fields O.9.4.32 Sample Information By sample kind, Sample No.
- 7.5. Message Common Fields O.9.4.4 Instrument specimen ID By Sample No.

2. Terms

(1) ASTM Reference Position

It is the field position defined by ASTM E1394-91 Standard.

(2) ASTM Field Name

It is the field name defined by ASTM E1394-91 Standard.

(3) Message acknowledgment

It is a response message for a received message of whether or not it is received.

(4) AU Series

In this specification, it signifies the automated anlyzers of AU680, AU480, and AU5800.

(5) Automation Ready

It signifies the transfer line system which is capable of connecting with the automated analyzer, AU5800.

3. Function Overview

This section outlines functions defined on the application level provided by the equipment.

(1) Realtime test requisition query function

The following processing can be done during measure on the equipment (realtime).The equipment shall transmit a message querying sample information, along with key information including a sample ID, to the host and the host shall return a message containing sample information suited to the key information to the host.

If the arbitrary by sample kind of “Online”-“Set Up”-“Test Requisition Information Receive” is set at “Real Time”, the function shall become effective. And for the cases of automated re-testing, if the re-testing arbitrary by sample kind of “Online”-“Set Up”-“Test Requisition Information Receive” is at “Real Time” and the above mentioned first testing by sample kind of “Online”-“Set Up”-“Result Transfer” is at “Real Time”, the function shall become effective.

(2) Realtime result transfer function

The following processing can be done during measure on the equipment (realtime).The equipment shall transmit result regarding an measured sample to the host.

Parameter settings shall determine whether or not to implement the realtime result transfer function at measure start. When [Realtime] is selected in any of [Online] - [Set Up] - [Result Transfer], the function shall be implemented.

(3) Batch result transfer function

The following processing can be done on the [Sample Manager] or [Repeat Data Verification] screen of the equipment. An operation on the screen shall trigger transfer of a saved result to the host.

Parameter settings shall determine whether or not to enable the realtime result transfer function on the [Sample Manager] or [Repeat Data Verification] screen. When [Realtime] or [Batch] is selected for the sample kind desired to be transferred in [Online] - [Result Transfer], the function shall be enabled.

(4) Sample information entry function according to host direction

The following processing can be done while the equipment operates. This function shall be similar to the realtime test requisition query, and allow the equipment to enter sample information. The realtime test requisition query enables the host to return a sample information message in reply to a sample information query message transmitted from the equipment. However, this function shall allow the host to transmit sample information regarding the sample to be measured, at any time, without using a query.

When [Host Direction] is selected for the sample kind desired to be received in [Online] - [Test Requisition Information Receive], the function shall be enabled. However, [Enabled] also needs to be selected in [Other Transfer] - [Equipment State].

(5) Equipment state transfer function

The following processing can be done while the equipment operates. The equipment shall transmit an equipment state to the host.

When [Enabled] is selected in [Online] - [Other Transfer] - [Equipment State], this function shall be enabled.

Table 3.1 shows messages used for the functions. A message type is information specifying a message type. For more information about messages, see 3.2 Message Field Definition.

Table 3.1: List of Messages Used by Function

Function	Message name	Message type	Transmission direction
Realtime test requisition query / test requisition query of auto repeat function	Test requisition query start notification	RB△	Equipment → Host
	Test requisition query start notification acknowledgment	MSA	Host → Equipment
	Test requisition query	R△△	Equipment → Host
	Test requisition query acknowledgment	MSA	Host → Equipment
	Test requisition query of auto repeat	Rh△	Equipment → Host
	Test requisition query acknowledgment	MSA	Host → Equipment
	Test requisition query end notification	RE△	Equipment → Host
	Test requisition query end notification acknowledgment	MSA	Host → Equipment
	Test requisition information	S△△	Host → Equipment
	Test requisition information acknowledgment	MSA	Equipment → Host
	Test requisition information of auto repeat	Sh△	Host → Equipment
	Test requisition information acknowledgment	MSA	Equipment → Host
Realtime result transfer function	Result transfer start notification	DB△	Equipment → Host
	Result transfer start notification acknowledgment	MSA	Host → Equipment
	Result / Quick result	D△△	Equipment → Host
	Result transfer acknowledgment	MSA	Host → Equipment
	Result transfer end notification	DE△	Equipment → Host
	Result transfer end notification acknowledgment	MSA	Host → Equipment
Batch result transfer function	Result transfer start notification	DB△	Equipment → Host
	Result transfer start notification acknowledgment	MSA	Host → Equipment
	Result	DM△	Equipment → Host
	Result transfer acknowledgment	MSA	Host → Equipment
	Result transfer end notification	DE△	Equipment → Host
	Result transfer end notification acknowledgment	MSA	Host → Equipment
Sample information entry function according to host direction	Test requisition information	SM△	Host → Equipment
	Test requisition information acknowledgment	MSA	Equipment → Host
Equipment state transfer function	Equipment state	ST△	Equipment → Host
	Equipment state acknowledgment	MSA	Host → Equipment

Record configuration is determined for each message used. Table 3.2 shows a record configuration list. Table 3.3 shows a list of records used in this specification.

Table 3.2: Message Record Configuration

Message name	Message record configuration
Test requisition query Test requisition query of auto repeat	Message header record (H) [Request information record (Q)] Message terminator record (L)
Test requisition information Test requisition information of auto repeat	Message header record (H) [Patient information record (P) *1 Test order record (O) *1] Message terminator record (L)
Result Quick result	Message header record (H) [Patient information record (P) *1 Test order record (O) *1 [Result record (R) *2]] Message terminator record (L)
Equipment state	Message header record (H) [Equipment state record (S)] Message terminator record (L)
Test requisition query start notification	Message header record (H) Message terminator record (L)
Test requisition query end notification	
Result transfer start notification	
Result transfer end notification	
acknowledgment	

*1: This record configuration can be used repeatedly. However, only one record is used in this specification.
*2: One result record shall be prepared for one result. As many result records as results are required.

Table 3.3: Record List

ASTM Reference	Record name	Record type ID	Description
7	Message header record	H	First record of a message. Contains sender/receiver information. A message type in this record specifies a message type.
8	Patient information record	P	Patient information such as a sample ID and patient name is set.
9	Test order record	O	Information regarding tests to be measured by the equipment is set.
10	Result record	R	Measured results are set.
12	Request information record	Q	Information identifying a patient, such as a sample ID, is set to query the host about test requisition information.
13	Message terminator record	L	Last record of a message. This record contains an acknowledgment code field, where information on whether or not normal reception has been performed is set.
(*1)	Equipment state record	S	The equipment state is determined according to equipment operations and modes such as measure. For the sample information entry function according to host direction, the host judges whether or not test order can be transmitted to the equipment, based on the equipment state.

(*1) ASTM 1394-91 does not specify this record. This record is specific to this specification and prescribed based on the "EQU - Equipment Detail Segment" for HL7.

4. Interface for the online functions overview

4.1. Hierarchical Structure for Online Functions

Interface for the online functions between the equipment and the host has a hierarchical structure explained in Fig. 4.4.1.

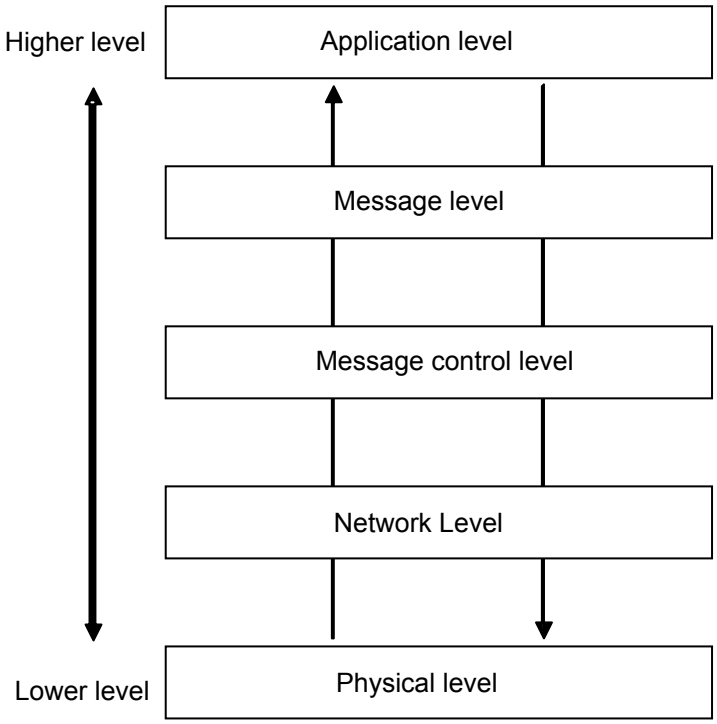

Fig. 4.4.1: Hierarchical Structure for Online Functions

4.2. Overview of Levels

This section outlines each level defined for the equipment's online functions.

(1) Physical level
This level defines physical connection between the equipment and the host, such as cables.

(2) Network level
This level defines a communication protocol to exchange data between the equipment and the host.
This online function adopts TCP/IP.

(3) Message control level
This level defines a retry method and processing when a timeout or communication error occurs between the equipment and the host.

(4) Message level
This level defines messages used for the online functions, based on ASTM 1394-91 and functions specific to this specification.
The method to disassemble a message into components such as sample information and result is defined.

(5) Application level
This level defines functions such as sample information reception and result transfer, which are realized via message exchange between the equipment and the host.

5. Physical Level/Network Level

The physical level shall define the following for communication between the equipment and the host.

- Transmission medium between the equipment and the host

The network level shall define the following for communication between the equipment and the host.

- Transmission system
- Transmission protocol
- IP address and port number used
- Start and end of communication connection

5.1. Basic Communication Specification

TCP/IP is adopted as communication protocol between the equipment and the host. Table 5.1.1 shows the basic communication specification.

Table 5.1.1: Basic Communication Specification

Item		Description	
1	Transmission medium	10Base-T or 100Base-TX	
2	Transmission system	CSMA-CD	
3	Transmission protocol	TCP/IP	
4	IP address	Equipment	*1
		Host	Any setting is available. (Setting is done in System Maintenance mode of the equipment.)

*1: The same IP address as for PROService is used.
For information on how to set the IP address, see the Service Manual.

Ports shall depend on functions provided by the equipment. Table 5.1.2 shows functions and corresponding ports. For relationship between the setting on the [Online] screen and ports used, see Table 5.1.3.

Table 5.1.2: Functions and Corresponding Ports

Function	Equipment	Host	Communication port	Port number setting *1
Realtime online test requisition query	Client	Server	A	Any 5-digit number
Realtime online test requisition query of auto repeat	Client	Server	A	Any 5-digit number
Realtime online result transfer	Client	Server	A	Any 5-digit number
Batch online result transfer	Client	Server	B	Any 5-digit number
Sample information entry according to host direction	Server	Client	C	Any 5-digit number
Equipment state transfer	Client	Server	D	Any 5-digit number

*1: Since PROService uses port number [80], set any other port number.

Table 5.1.3: Port Use Conditions

Communication port	Port use conditions *1
A	[Realtime] is selected in any of [Online] - [Set Up] - [Test Requisition Information Receive], or [Realtime] is selected for any of result transfer.
B	Any item other than [None] is selected in any of [Online] - [Set Up] - [Result Transfer].
C	[Host Direction] is selected in any of [Online] - [Set Up] - [Test Requisition Information Receive].
D	[Enabled] is selected in [Online] - [Set Up] - [Other Transfer] - [Equipment State].

*1: For information about online condition setting, see Appendix A.3 Online Condition Parameters.

5.2. Connection Sequence

Fig. 5.2.1 shows a connection sequence between the client and the server.
Connect or accept the port for the function selected to be used in Table 5.1.2.
The equipment and the host must be connectable to each other continuously from the system start-up to system termination. When a communication error occurs and the connection is interrupted, reconnect the equipment and the host.

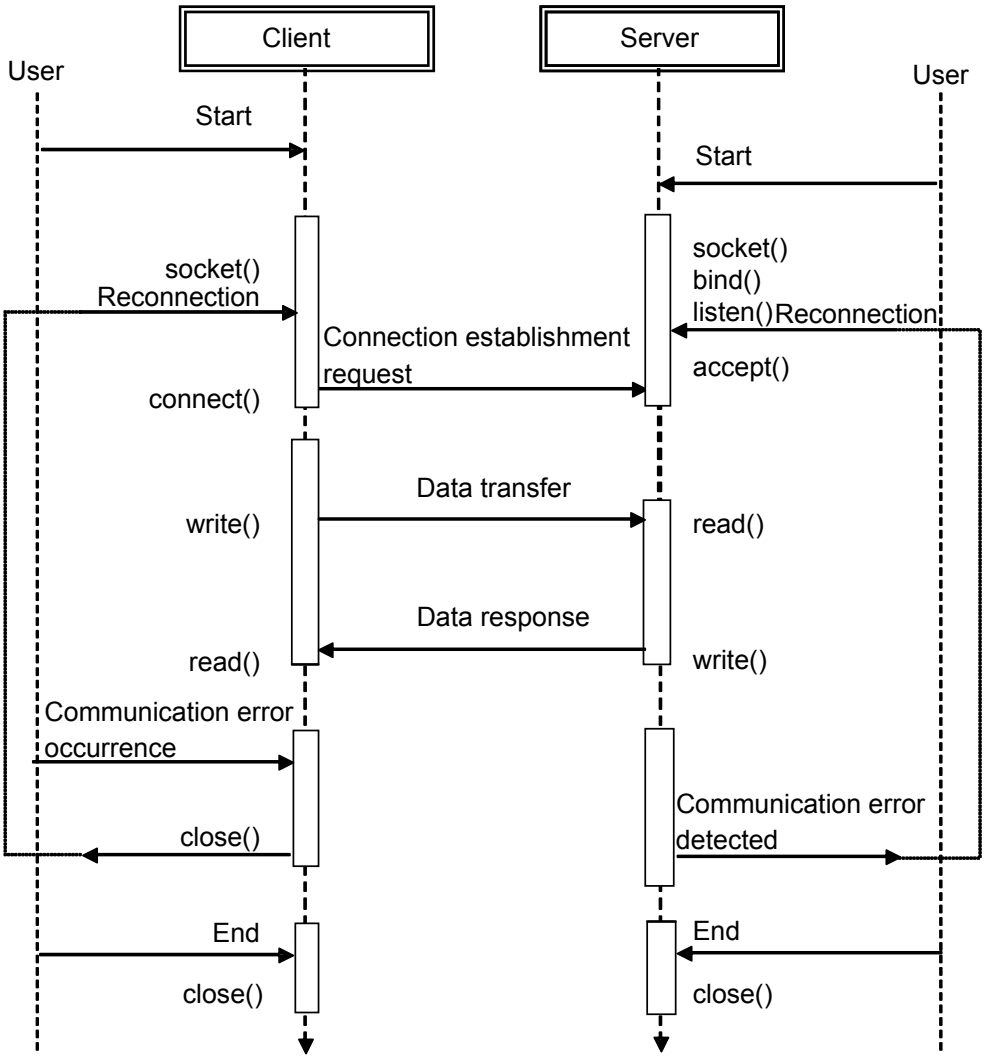

Fig. 5.2.1: Connection Sequence

6. Message Control Level

The message control level shall define the following for communication between the equipment and the host.

- Message start/end codes
- Message acknowledgment
- Timer used for communication
- Message retries

6.1. Message Start/End Codes

Whether a start/end code is used shall be selected for message transmission. When the host use start/end codes, 2 bytes must be set for each start and end code, depending on operation. However, it is impossible to set a start code only.

As an example to adapt the start/end codes to host operation, a host implemented using HL7 is thinkable. When the host uses HL7, start code [0x0B] and end codes [0x1C] and [0x0D] may be used based on the "HL7 Implementation Support Guide C.4 MINIMAL LOWER LAYER PROTOCOL." In that case, set the similar start/end codes in [Online] when connecting to the equipment having this specification. This setting eliminates the need for implementing the start/end codes for the equipment.

0x0B	Message	0X1C	0x0D

Fig. 6.1.1: HL7 Start/End Codes

6.2. Message Acknowledgment

The message receiving side shall return message acknowledgment to the transmitting side during communication between the equipment and the host. The message acknowledgment contains an acknowledgment code and the message receiving side shall return acknowledgment after judging whether the message has been properly received or whether there is something wrong with the message. For message acknowledgment, see 7.4.1 (4) Message Acknowledgment.

Fig. 6.2.1 shows an example of acknowledgment for the message, using a realtime online test requisition query sequence. A code in square brackets in Fig. 3.2.1 indicates a message type. The message type in message acknowledgment used here is [MSA].

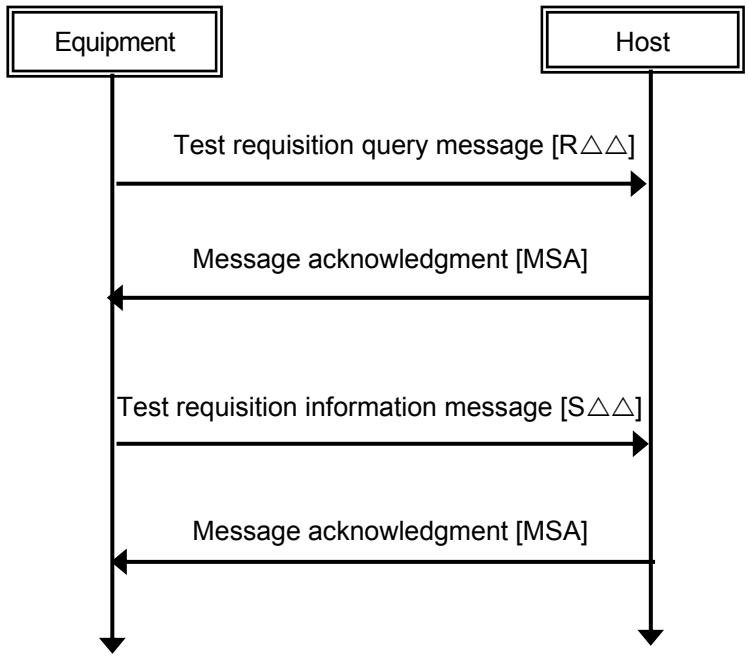

Fig. 6.2.1: Message Acknowledgment

6.3. Timer Used for Communication

Table 6.3.1 shows a timer used in the communication sequence. The T1 (t1) round trip timer shall function until reception of message acknowledgment [MSA] in reply to messages transmitted by the equipment or the host (all messages other than message acknowledgment [MSA]). T2 is different from T1, and intended for specific messages. It shall serve from test requisition query message transmission to test requisition information reception. Set T1 and T2 so that T2 is greater than T1.

Table 6.3.1 Timer used for Communication

Timer set on	Type	Timer type	Application
Equipment	T1	Round trip timer	Timeout time from message transmission to message acknowledgment [MSA] reception by the equipment
	T2	Round trip timer	Timeout time from test requisition query message transmission to test requisition information message reception by the equipment
	T3	Interval timer	Wait interval until next test requisition query message transmission Wait interval until next result message transmission
	T4	Sleep timer	Timeout time from test requisition information message transmission to message acknowledgment [MSA] reception by the host
Host	t1	Round trip timer	Timeout time from test requisition information message transmission to message acknowledgment [MSA] reception by the host
	t2		
	t3		
	t4	Sleep timer	Retransmission interval for acknowledgment code [AR *1] transmission from the equipment

*1: Acknowledgment code causing a retry. [AA] shall be set for normal reception. For information about acknowledgment codes, see 7.4.1 (4) Message Acknowledgment.

Fig. 6.3.1 shows an example of timer setting, using the realtime online test requisition query and realtime result transfer sequence. Section 6.4 shows an example of T4 (t4).

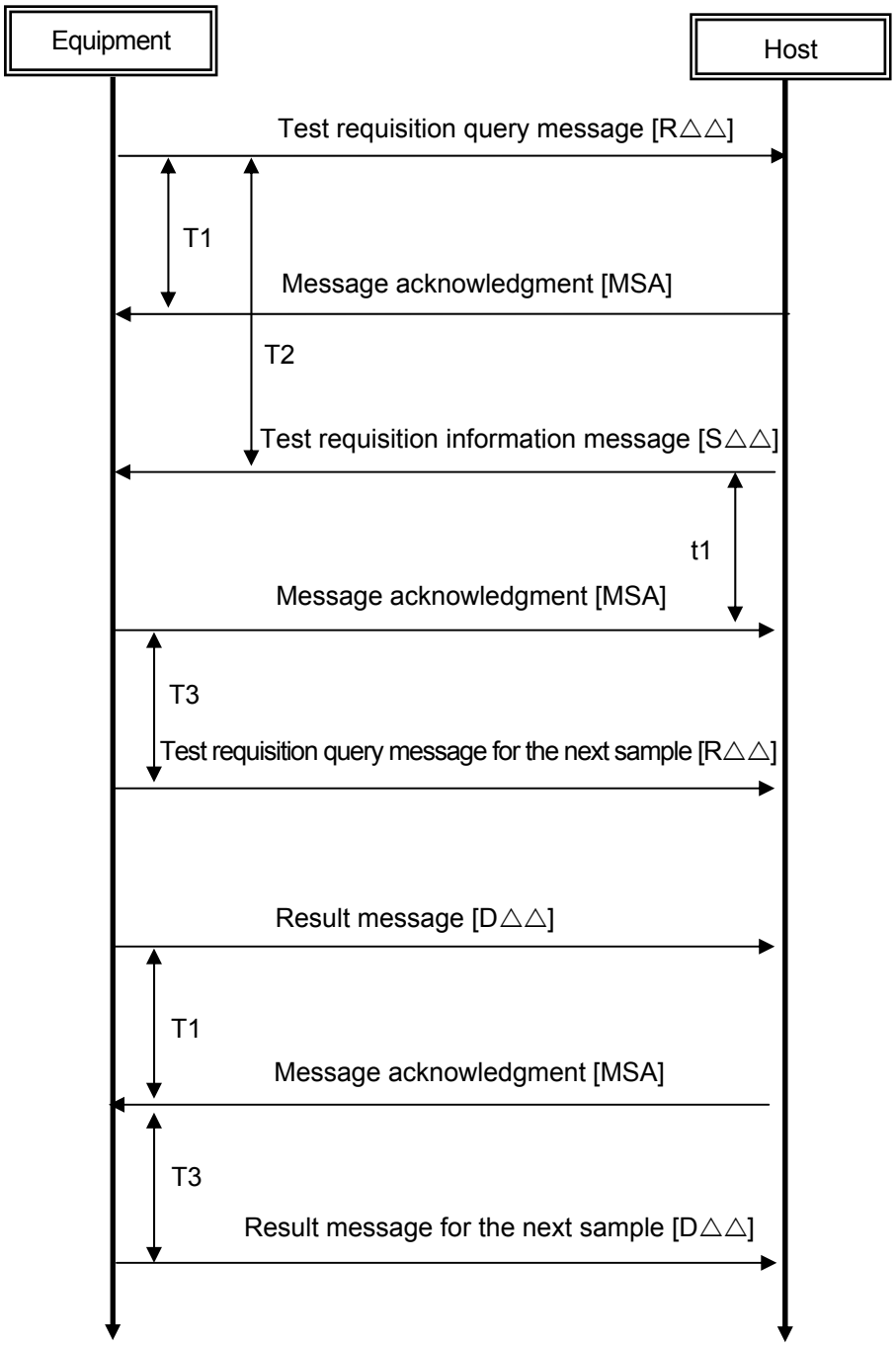

Fig. 6.3.1: Timer Setting

6.4. Retry

When a message is not transmitted/received properly, a retry shall be performed. The specification defines two types of triggers to perform retries.

- A timeout occurs at the round trip timer (T1, T2 or t1).
- The acknowledgment code in the received message acknowledgment [MSA] is [AR].

Table 6.4.1 shows messages to be retried in reply to the trigger. Only the date and time of message (see 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification) shall be updated, and the message identical to the one transmitted on the first attempt shall be retried. The message control IDs (see the same section as Date and time of message) shall also be identical.

Table 6.4.1: Retried Messages

Trigger	Message to be retried
Timeout	Message transmitted when setting the timer
Acknowledgment code [AR]	Transmitted message corresponding to the received message acknowledgment

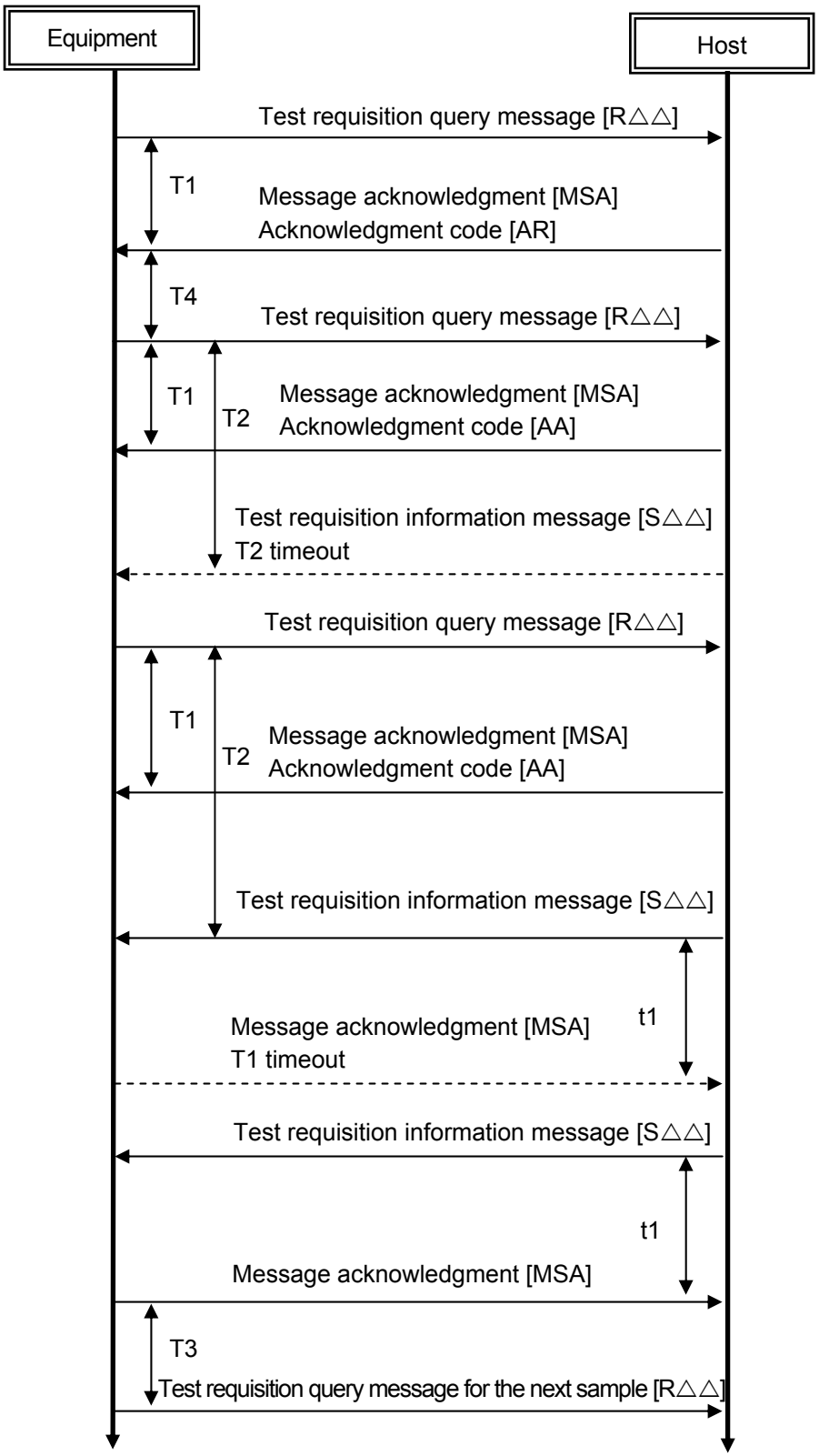

Fig. 6.4.1: Retry Sequence Example

7. Message Level

This section explains messages of this specification which uses ASTM 1394-91. For functions which are not achieved only via ASTM 1394-91, messages are defined by introducing the HL7 concept.

7.1. Terms

(1) Message

A message shall be comprised of several records (see 7.1 (2)), and a record shall be composed of several fields (see 7.1 (3)). Fig. 7.1.1 shows a concept of the message.

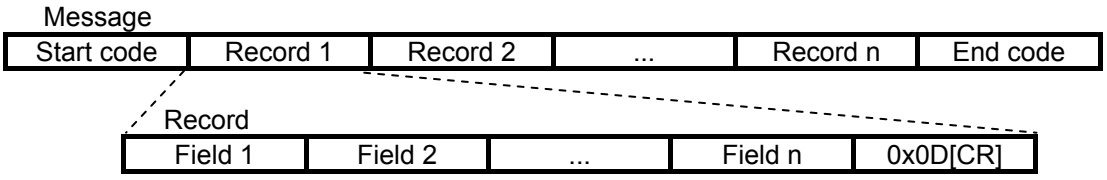

Fig. 7.1.1: Message Concept

(2) Record

A record shall be composed of several groups of fields and each record contains specific information. For example, patient information is contained in the "Patient information record (P) and measured result is contained in the "Result record (R)." An alphabet in brackets shall be a record type ID. To delimit records, suffix 0x0D[CR] to the record.

The message start/end records are determined. The first record shall be "Message header record (H)" and the last record shall be "Message terminator record (L)." Other records shall be contained between Records H and L.

For information about records, see Table 3.3 Record List.

(3) Field

A field shall contain individual information composing a record, such as a patient name and result. When there is no information to be set, the field shall be called a null field. Where each field containing specific information is located in a record shall uniquely be determined for each record. Correlating fields in a record with individual information shall be done by counting the number of fields from the beginning of the record.

7.2. Character Code

As a character code, UNICODE UTF-8 shall be used.

7.3. Delimiter

The ASTM 1394-91 delimiters include a delimiter used for records and delimiters used for fields. Although the record delimiter is only 0x0D[CR], described in 7.1 (2) Record, there are four types of field delimiters. The field delimiters can be defined for each message, using a message header record. However, ASTM 1394-91 recommends the use of delimiters shown in Table 7.3.1.

Table 7.3.1: Delimiter List

Delimiter	Recommended characters
Field delimiter	0X7C[|]
Repeat delimiter	0X5C[\]
Component delimiter	0X5E[^]
Escape delimiter	0X26[&]

7.4. Message Field Definition

A field comprising each message shall be defined. The rightmost number of ASTM 1394 Reference shall indicate a field position of the record. Since only used fields are mentioned, the numbers are not sequential. Use null fields at missing number positions. When a field of a missing number contains information, this information shall be ignored. Field names in this specification are the names used on the equipment, with which "ASTM 1394 field names" defined in ASTM 1394-91 are replaced. The maximum number of characters indicates that of one-byte characters. When two-byte characters are used, the maximum number of characters is half of that of one-byte characters.

7.4.1. Realtime Test Requisition Query/Realtime Test Requisition Query of Auto Repeat

(1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages

Transmission direction									
Equipment → Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	The equipment and the host shall respectively set a control ID to identify a message. The message transmitting side shall set "00001-65535": (cyclic) and the receiving side shall transmit the message acknowledgment (see 7.4.1 (4)) by copying the message control ID of the received message into the acknowledgment. All messages other than message acknowledgment shall be counted up whenever a message is transmitted.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	The ID of the message transmitting side shall be set. Decision on whether or not to use the field and a character string to be set can be programmed on the [Online] screen. When the equipment transmits a message, the equipment instance identifier on the [Online] screen shall be set. When the host transmits a message, the character string identical to the host ID on the [Online] screen or any character string shall be set.

ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	The ID of the message receiving side shall be set. Decision on whether or not to use the field and a character string to be set can be programmed on the [Online] screen. When the equipment transmits a message, the host ID on the [Online] screen shall be set. When the host transmits a message, the character string identical to the equipment instance identifier on the [Online] screen or any character string shall be set.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"RB△": Test requisition query start notification and "RB△": Test requisition query end notification shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Message terminator record (L)									
L	13	1	1	Record type ID	Record type ID	Character string	1	Fixed	"L" shall be set.
L	13	1	2	Sequence number	Sequence number	Value	1	Fixed	"1" shall be set.
L	13	1	3	End code	End code	Character string	1	Fixed	"N" shall be set.
			4	*1	Acknowledgment code	Character string	2	Fixed	"AA" shall be set. For information about acknowledgment codes, see 7.4.1 (4) Message Acknowledgment.
			5	*1	Error message	Character string	80	Variable	"AA" shall be set.

*1: The equipment shall uniquely set the message control ID for a message to be transmitted according to the following function combination and count it up.

The following shows combination of functions at each port.

1. Realtime test requisition query
   Realtime test requisition query of auto repeat
   Realtime result transfer
2. Batch online result transfer
3. Equipment state transfer

Supplementary explanation: The sample information entry function according to host direction shall not be included in the above, since this function requires messages that the host actively transmits.

*2: This field is specific to Beckman Coulter, and is not defined in ASTM 1394-91.

<Communication format example>

- Message header record (H)
  H|¥^&|00004||DEVICE NAME|||||Host NAME|RB |||20090114153028<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

(2) Test Requisition Query Message/Test Requisition Query Message of Auto Repeat

Transmission direction									
Equipment → Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"R△△": Test requisition query of normal/repeat and "Rh△": Test requisition query of auto repeat shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Request information record (Q)									
Q	12	1	1	Record type ID	Record type ID	Character string	1	Fixed	"Q" shall be set.
Q	12	1	2	Sequence number	Sequence number	Value	4	Fixed	Number starting from "0001" indicating record repetition in the message. The maximum value shall indicate a number of samples to be queried in a message. *1 Counted up from "0001" for each request information record.
Q	12	1	3	Starting range ID number	Test requisition query start number	See Test Requisition Query Start Number in 7.5 Message Common Fields.			
Q	12	1	4	Ending range ID number	Test requisition query end number	See Test Requisition Query End Number in 7.5 Message Common Fields.			
Q	12	1	13	Request information status code	Request information status code	N	1	Fixed	"N" shall be set. The test requisition query cannot be corrected.
Q	12	1	14		Sample information	See Sample Information in 7.5 Message Common Fields.			
Message terminator record (L)									
See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.									

*1:On the equipment, the number is fixed at "0001" since only one sample is queried in a message.

<Communication format example>
Example of routine normal serum sample:

- Message header record (H)
  H|¥^&|00004||DEVICE NAME|||||Host NAME|R |||20090114153028<CR>
- Request information record (Q)
  Q|0001|^01234567890^ 0001|^^^|||||||||N| ^ ^0001^^^01234567890^1234^8^ <CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

Example of emergency repeat urine sample:

- Message header record (H)
  H|¥^&|00015||DEVICE NAME|||||Host NAME|R |||20090114153028<CR>
- Request information record (Q)
  Q|0001|^01234567890^HE002|^^^|||||||||N|H^E^002^^^01234567890^1234^1^U<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

(3) Test Requisition Information Message/Test Requisition Information Message of Auto Repeat

Transmission direction									
Equipment ← Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"S△△": Test requisition result of normal/repeat and "Sh△": Test requisition result of auto repeat shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Patient information record (P)									
P	8	1	1	Record type ID	Record type ID	Character string	1	Fixed	"P" shall be set.
P	8	1	2	Sequence number	Sequence number	Value	4	Fixed	"0001" shall be set.
P	8	1	4	Laboratory assigned patient ID	Sample ID	Character string	26	Variable	On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed. The sample ID in the sample information in the test requisition query/test requisition query of auto repeat shall be copied and set.
P	8	1	5	Patient ID	Patient ID (PID)	Character string	20	Variable	PID shall be set (any character string). *1

ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Patient information record (P)									
P	8	1	6	Patient name	Patient information 1 *2	Character string	20	Variable	Any character string shall be set. When patient information includes a patient name, it is recommended to use this field. The patient name registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	7	Mother's maiden name	Patient information 2 *2	Character string	20	Variable	Any character string shall be set. When patient information includes a mother's maiden name, it is recommended to use this field. The mother's maiden name registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	8	Birthdate	Years/months (Birthdate)	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. See Years/Months (Birthdate) in 7.5 Message Common Fields.			
P	8	1	9	Patient sex	Patient sex	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. See Patient Sex in 7.5 Message Common Fields.			
P	8	1	10	Patient race-ethnic origin	Patient information 3 *2	Character string	20	Variable	Any character string shall be set. When patient information includes patient race-ethnic origin, it is recommended to use this field. The patient race-ethnic origin registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	17	Patient height	Patient information 4 *2	Character string	20	Variable	Any character string shall be set. When patient information includes patient height, it is recommended to use this field. The patient height registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.

ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Patient information record (P)									
P	8	1	18	Patient weight	Patient information 5 *2	Character string	20	Variable	Any character string shall be set. When patient information includes patient weight, it is recommended to use this field. The patient weight registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	26	Location	Patient information 6 *2	Character string	20	Variable	Any character string shall be set. When patient information includes location, it is recommended to use this field. The location is information such as ward and bed data for the patient. The location registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
Test order record (O)									
O	9	4	1	Record type ID	Record type ID	Character string	1	Fixed	"O" shall be set.
O	9	4	2	Sequence number	Sequence number	Value	4	Fixed	"0001" shall be set.
O	9	4	3	Specimen ID	Specimen ID	See Specimen ID in 7.5 Message Common Fields.			
O	9	4	4	Instrument specimen ID	Instrument specimen ID	See Instrument Specimen ID in 7.5 Message Common Fields.			
O	9	4	32	Universal test ID	Sample information	See Sample Information in 7.5 Message Common Fields.			
O	9	4	33		Test requisition information	See Test Requisition Information in 7.5 Message Common Fields.			
Message terminator record (L)									
See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.									

*1:The equipment shall not save the data to a database. In addition, this data is not added to the result message.

*2:In this specification, it is recommended to set patient information 1 to 6 to the above information. However, a demand to set other information is envisaged. For example, Field 11 in Record P of ASTM 1394-91 defines a patient address. However, to set the patient address, do not set this information in Field 11 but set it in any field of information 1 to 6.

Ex.:To set the patient address in place of the location:
Set the patient address in Field 26.

<Communication format example>
Example of routine normal serum sample:

- Message header record (H)
  H|¥^&|00004||Host NAME|||||DEVICE NAME|S |||20090114153028<CR>
- Patient information record (P)
  P|0001||01234567890|PatientID|name|family name|70^11^|M|JAPAN|||||||172cm|58kg|||||||Place<CR>
- Test order record (O)
  O|0001|^01234567890|01234567890^0001|||||||||||||||||||||||||| ^ ^0001^^^01234567890^1234^8^ |001^2¥096^0<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

(4) Message Acknowledgment

Transmission direction									
This message is a message acknowledgment transmitted by the receiving side in reply to each message.									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"MSA" shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Message terminator record (L)									
L	13	1	1	Record type ID	Record type ID	Character string	1	Fixed	"L" shall be set.
L	13	1	2	Sequence number	Sequence number	Value	1	Fixed	"1" shall be set.
L	13	1	3	End code	End code	Character string	1	Fixed	"N" shall be set.
			4		Acknowledgment code	Character string	2	Fixed	An acknowledgment code shall be determined by judging whether the message has been properly received and whether there is something wrong with the message after receiving the message. For more information, see the following table. "AA": Normal reception "AE": Received message illegal "AR": Retry request "CE": Message reception disabled
			5		Error message	Character string	80	Variable	"AA" shall be set.

Acknowledgment code	Description
AA	Normal reception
AE	[AE] shall be set when the received message is illegal. The equipment shall check each field according to (2) Alarm No. 6102: Online Format Error in Appendix A.5 Alarm List to confirm whether or not the received message is illegal. When the received message is illegal, alarm No. 6102 shall be raised.
AR	[AR] shall be returned in the following cases, assuming that the transmitting side will re-transmit the message after T4 (t4) has passed. - Although a message is received, the received message cannot be processed as another process is being performed. - An application error has occurred on the message receiving side. The following cases are possible when the equipment sets acknowledgment code [AR]. - The test requisition information is received when the mode ID is [CNRS] while using the sample information entry function according to host direction (see 8.4). - An error has occurred while entering the test requisition information message in the database.

Acknowledgment code	Description
CE	This code shall be set when the sample information message cannot be entered, for example, the test requisition information format is not consistent with the equipment setting causing the entry to be disabled, or the retry count is exceeded. The equipment shall transmit acknowledgment code [CE] when any of the following alarms is raised. For more information about alarms, see Appendix A.4 Alarm List. Alarm No. 6101 (Error type: 64), 6103, 6104, 6111, 6112, 6113, 6114, 6115, 6116, 6117, 6118, 6119, 6131, 6132, 6133, 6134, 6135, 6136, 6152, 6161, 6162

<Communication format example>

- Message header record (H)
  H|¥^&|00004||Host NAME|||||DEVICE NAME|MSA|||20090114153028<CR>
- Message terminator record (L)
  L|1|N|AR|AA<CR>

7.4.2. Realtime Result Transfer

(1) Result Transfer Start Notification/Result Transfer End Notification Messages

Transmission direction									
Equipment → Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"DB△": Result transfer start notification and "DE△": Result transfer end notification shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Message terminator record (L)									
See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.									

<Communication format example>

- Message header record (H)
  H|¥^&|14563||DEVICE NAME|||||Host NAME|DB |||20090114153028<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

(2) Result Message

Transmission direction									
Equipment → Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"D△△": Result and shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Patient information record (P)									
See 7.4.1 (3) Test Requisition Information Message/Test Requisition Information Message of Auto Repeat.									
Test order record (O)									
See 7.4.1 (3) Test Requisition Information Message/Test Requisition Information Message of Auto Repeat.									
Result record (R)									
R	10	1	1	Record type ID	Record type ID	Character string	1	Fixed	"R" shall be set.
R	10	1	2	Sequence number	Sequence number	Value	5	Fixed	The first sequence number in one message shall be "00001" and counted up in a range of "00001-65535" for one result.
R	10	1	4	Data or measurement value	Result	See Result in 7.5 Message Common Fields.			
R	10	1	7	Result abnormal flag	Data flag	See Data Flag 7.5 in Message Common Fields.			
R	10	1	9	Result status	Quick type	See Quick Type in 7.5 Message Common Fields.			
R	10	1	15	Universal test ID	Sample information	See Sample Information in 7.5 Message Common Fields. The sample information in the test requisition query message/test requisition query message of auto repeat shall be copied and set.			
R	10	1	16		CAL/Control/RB number	See CAL/Control/RB Number in 7.5 Message Common Fields.			
R	10	1	17		Lot/bottle No.	See Lot/Bottle No. in 7.5 Message Common Fields.			
R	10	1	18		Unit No. /Cuvette	See Unit No./Cuvette in 7.5 Message Common Fields.			
Message terminator record (L)									
See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.									

<Communication format example>
Example of routine normal serum sample:

- Message header record (H)
  H|¥^&|00004||DEVICE NAME|||||Host NAME|D |||20090114153028<CR>
- Patient information record (P)
  P|0001||01234567890||name|family name|70^11^|M|JAPAN|||||||172cm|58kg|||||||Place<CR>
- Test order record (O)
  O|0001|^01234567890|01234567890^0001|||||||||||||||||||||||||| ^ ^0001^^^01234567890^1234^8^ |001^2¥096^0<CR>
- Result record (R)
  R|00001||001^142.4^C^|||H ¥i3|||||||| ^ ^0001^^^01234567890^1234^8^ ||1111^9870^1111^9875^^^^<CR>
  R|00002||LIP^1^n^|||||||||||| ^ ^0001^^^01234567890^1234^8^ ||1234^1234^^^^^^<CR>
  R|00003||ICT^3^n^|||||||||||| ^ ^0001^^^01234567890^1234^8^ ||1234^1234^^^^^^<CR>
  R|00004||HEM^2^n^|||||||||||| ^ ^0001^^^01234567890^1234^8^ ||1234^1234^^^^^^<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

* This is an example of setting test [096] as an LIH test item.

Example of calibrator:

- Message header record (H)
  H|¥^&|00004||DEVICE NAME|||||Host NAME|D |||20090114153028<CR>
- Patient information record (P)
  P|0001||01234567890<CR>
- Test order record (O)
  O|0001|^01234567890|01234567890^A001|||||||||||||||||||||||||^A^001^^^01234567890^^^ |001^1<CR>
- Result record (R)
  R|00001||001^1.2345^O^||||||||||^A^001^^^01234567890^^^ ||1111^9870^1111^9875^^^^<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

(3) Message Acknowledgment

See 7.4.1 (4) Message Acknowledgment.

7.4.3. Batch Online Result Transfer

(1) Result Transfer Start Notification/Result Transfer End Notification Messages

See 7.4.2 (1) Result Transfer Start Notification/Result Transfer End Notification Messages.

(2) Result Message

Transmission direction									
Equipment → Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.

ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"DM△": Result shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Patient information record (P)									
See 7.4.1 (3) Test Requisition Information Message/Test Requisition Information Message of Auto Repeat Messages									
Test order record (O)									
See 7.4.1 (3) Test Requisition Information Message/Test Requisition Information Message of Auto Repeat Messages									
Result record (R)									
R	10	1	1	Record type ID	Record type ID	Character string	1	Fixed	"R" shall be set.
R	10	1	2	Sequence number	Sequence number	Value	5	Fixed	The first sequence number in one message shall be "00001" and counted up in a range of "00001-65535" for one result.
R	10	1	4	Data or measurement value	Result	See Result in 7.5 Message Common Fields.			
R	10	1	7	Result abnormal flag	Data flag	See Data Flag 7.5 in Message Common Fields.			
R	10	1	9	Result status	Quick type	See Quick Type in 7.5 Message Common Fields.			
R	10	1	15	*1	Sample information	See Sample Information in 7.5 Message Common Fields. The sample information for the sample to be transferred, registered on the equipment, shall be set.			
R	10	1	16	*1	CAL/Control/RB number	See CAL/Control/RB Number in 7.5 Message Common Fields.			
R	10	1	17	*1	Lot/bottle No.	See Lot/Bottle No. in 7.5 Message Common Fields.			
R	10	1	18	*1	Unit No. /Cuvette	See Unit No./Cuvette in 7.5 Message Common Fields.			
Message terminator record (L)									
See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.									

*1: The equipment shall not save the data to a database. In addition, this data is not added to the result message.

<Communication format example>
Example of routine normal serum sample:

- Message header record (H)
  H|¥^&|00004||Host NAME|||||DEVICE NAME|DM |||20090114153028<CR>
- Patient information record (P)
  P|0001||01234567890||name|family name|70^11^|M|JAPAN|||||||172cm|58kg|||||||Place<CR>
- Test order record (O)
  O|0001|^01234567890|01234567890^0001|||||||||||||||||||||||||| ^ ^0001^^^01234567890^1234^8^ |001^2¥096^0<CR>
- Result record (R)
  R|00001||001^142.4^C^|||H¥i3||||||| ^ ^0001^^^01234567890^1234^8^ ||1111^9870^1111^9875^^^^<CR>
  R|00002||LIP^1^n^|||||||||| ^ ^0001^^^01234567890^1234^8^ ||1234^1234^^^^^^<CR>
  R|00003||ICT^3^n^|||||||||| ^ ^0001^^^01234567890^1234^8^ ||1234^1234^^^^^^<CR>
  R|00004||HEM^2^n^|||||||||| ^ ^0001^^^01234567890^1234^8^ ||1234^1234^^^^^^<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

* This is an example of setting test [096] as an LIH test item.

(3) Message Acknowledgment

See 7.4.1 (4) Message Acknowledgment.

7.4.4. Sample Information Entry Function according to Host Direction

(1) Test Requisition Information Message

Transmission direction									
Equipment ← Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"SM△": Test requisition information of normal/repeat shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Patient information record (P)									
P	8	1	1	Record type ID	Record type ID	Character string	1	Fixed	"P" shall be set.
P	8	1	2	Sequence number	Sequence number	Value	4	Fixed	"0001" shall be set.
P	8	1	4	Laboratory assigned patient ID	Sample ID	Character string	26	Variable	On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed. The sample ID registered on the host for the sample to be measured shall be set.
P	8	1	5	Patient ID	Patient ID (PID)	Character string	20	Variable	PID shall be set (any character string). (*1)
P	8	1	6	Patient name	Patient information 1	Character string	20	Variable	Any character string shall be set. When patient information includes a patient name, it is recommended to use this field. The patient name registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	7	Mother's maiden name	Patient information 2	Character string	20	Variable	Any character string shall be set. When patient information includes a mother's maiden name, it is recommended to use this field. The mother's maiden name registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.

ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
P	8	1	8	Birthdate	Years/months (Birthdate)	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. See Years/Months (Birthdate) in 7.5 Message Common Fields.			
P	8	1	9	Patient sex	Patient sex	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. See Patient Sex in 7.5 Message Common Fields.			
P	8	1	10	Patient race-ethnic origin	Patient information 3	Character string	20	Variable	Any character string shall be set. When patient information includes patient race-ethnic origin, it is recommended to use this field. The patient race-ethnic origin registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	17	Patient height	Patient information 4	Character string	20	Variable	Any character string shall be set. When patient information includes patient height, it is recommended to use this field. The patient height registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	18	Patient weight	Patient information 5	Character string	20	Variable	Any character string shall be set. When patient information includes patient weight, it is recommended to use this field. The patient weight registered on the host for the sample to be measured shall be set. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.
P	8	1	26	Location	Patient information 6	Character string	20	Variable	Any character string shall be set. When patient information includes location, it is recommended to use this field. The location registered on the host for the sample to be measured shall be set. The location is information such as ward and bed data for the patient. On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits can be programmed.

ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Test order record (O)									
O	9	4	1	Record type ID	Record type ID	Character string	1	Fixed	"O" shall be set.
O	9	4	2	Sequence number	Sequence number	Value	4	Variable	"0001" shall be set.
O	9	4	3	Specimen ID	Specimen ID	See Specimen ID in 7.5 Message Common Fields. The sample ID registered on the host for the sample to be measured shall be set.			
O	9	4	4	Instrument specimen ID	Instrument specimen ID	See Instrument Specimen ID in 7.5 Message Common Fields.			
O	9	4	32	Universal test ID	Sample information	See Sample Information in 7.5 Message Common Fields. The sample information registered on the host for the sample to be measured shall be set.			
O	9	4	33		Test requisition information	See Test Requisition Information in 7.5 Message Common Fields. The test requisition information registered on the host for the sample to be measured shall be set.			
Message terminator record (L)									
See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.									

*1:The equipment shall not save the data to a database. In addition, this data is not added to the result message.

<Communication format example>
Example of routine normal serum sample:

- Message header record (H)
  H|¥^&|00004||Host NAME|||||DEVICE NAME|SM |||20090114153028<CR>
- Patient information record (P)
  P|0001||01234567890|Patient-1|name|family name|70^11^|M|JAPAN|||||||172cm|58kg|||||||Place<CR>
- Test order record (O)
  O|0001|^01234567890|01234567890^|||||||||||||||||||||||||||||| ^ ^^^^01234567890^^^^ |001^2¥002^1¥100^0<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

(2) Message Acknowledgment

See 7.4.1 (4) Message Acknowledgment.

7.4.5. Equipment State Transfer Function

(1) Equipment State Transfer Message

Transmission direction									
Equipment → Host									
ASTM E1394 reference position				ASTM E1394 field name	Field name in this specification	Set value	Maximum number of characters	Variable length	Description
Message header record (H)									
H	7	1	1	Record type ID	Record type ID	Character string	1	Fixed	"H" shall be set.
H	7	1	2	Delimiter definition	Delimiter definition	Character string	4	Fixed	"|\^&" shall be set.
H	7	1	3	Message control ID	Message control ID	Value	5	Fixed	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	5	Sender name or ID	Sender name or ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	10	Receiver ID	Receiver ID	Character string	32	Variable	See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.
H	7	1	11	Comment or special instructions	Message type	Character string	3	Fixed	"ST△": Equipment state shall be set.
H	7	1	14	Date and time of message	Date and time of message	Date and time	14	Fixed	The message transmission time shall be set in the YYYYMMDDhhmmss format.
Equipment state record (S)									
			1	Record type ID	Record type ID	Character string	1	Fixed	"S" shall be set.
			2	Equipment instance identifier	Equipment instance identifier	Character string	32	Fixed	Reserved (null field)
			3	Event date/time	Event date/time	Date and time	14	Fixed	The event time shall be set in the YYYYMMDDhhmmss format. * This time is different from the message transmission time.
			4	Equipment state	Equipment state	Character string	See Table 7.4.5.1: Equipment State Field Configuration.		
			5	Local/remote control state	Mode	Character string	See Table 7.4.5.3: Mode Field Configuration.		
			6	Alert level	Alert level	Character string	3	Variable	Reserved (null field)
Message terminator record (L)									
See 7.4.1 (1) Test Requisition Query Start Notification/Test Requisition Query End Notification Messages.									

<Communication format example>

- Message header record (H)
  H|¥^&|00004||DEVICE NAME|||||Host NAME|ST |||20090114153028<CR>
- Equipment state record (S)
  S||20090114153008|OP^Normal Operation|CNRS^CAN_NOT_RECEIVE_SAMPLE||<CR>
- Message terminator record (L)
  L|1|N|AA|AA<CR>

Table 7.4.5.1: Equipment State Field Configuration

Components: |<Equipment state>^<Equipment state text>|

	Set item	Set value	Maximum number of characters	Variable length	Description
Item details	Equipment state	Character string	2	Variable	See the table below. For information about which equipment state is set depending on equipment conditions, see Table 7.4.5.2: Equipment State.
	Equipment state text	Character string	16	Variable	Equipment state text described in the following table shall be set according to the equipment state.

Table 7.4.5.2: Equipment State

Equipment state	Equipment state text	Description
'PU'	'Powered Up'	The equipment is not in the left state.
'IN'	'Initializing'	The equipment analyzer is initializing.
'ID'	'Idle'	The equipment is ready to start measure in STANDBY mode.
'CO'	'Configuring'	The equipment is editing parameters, in MAINTENANCE mode or saving data in external memory such as FD or CD.
'OP'	'Normal Operation'	The equipment is measuring, washing (W1/W2) or in PHOTOCAL mode.
'CL'	'Clearing'	The equipment is replacing the index with another index. After the index is replaced, sample information entered in the index is in the same state as saved in the previous index. To measure the sample that has been entered but not been measured before the index is replaced, in the current index, re-transmit the test requisition information message about the sample to be measured.
'PA'	'Pausing'	The equipment is shifting to PAUSE mode during measure.
'PD'	'Paused'	The equipment is in PAUSE mode.
'ES'	'E -stopped'	The equipment is in STOP mode or shifting to STOP mode during measure.
null	'No state change'	The equipment state in the previous transmission remains the same. Or the state is null and the mode ID is "EDPR" in END mode.

Table 7.4.5.3: Mode Field Configuration

Components: |<Mode ID>^<Mode text>|

	Set item	Set value	Maximum number of characters	Variable length	Description
Item details	Mode ID	Character string	4	Fixed	See the table below. For information about which mode ID is set depending on equipment conditions, see Table 7.4.5.4: Mode ID.
	Mode text	Character string	24	Variable	Mode text described in the following table shall be set according to the mode ID.

Table 7.4.5.4: Mode ID

Mode ID	Mode text	Description
'EDPR'	'END OF PROCESS'	The operation mode is END. It is a state where the equipment is not ready to receive the test requisition information message. The equipment will be turned off after receiving the equipment state message.
'CNRS'	'CAN NOT RECEIVE SAMPLE'	It is a state where the equipment is not ready to receive the test requisition information message. For more information, see (4) Alarm No. 6104: Online Requisition Information Receive Error in Appendix A.5 Alarm List.
'ENRS'	'ENABLE TO RECEIVE SAMPLE'	It is a state where the equipment is ready to receive the test requisition information message.

(2) Message Acknowledgment

See 7.4.1 (4) Message Acknowledgment.

7.5. Message Common Fields

Q.12.1.3 Test requisition query start number

Components: |<null>^<Sample ID>^<Measure Type·Sample Kind·Sample No.>|

	Set item	Set value	Maximum number of characters	Variable length	Description
Item details	Sample ID	Character string	26	Variable	On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits (0 to 26) can be programmed.
	Measure type· Sample kind· Sample No.	Character string	5	Variable	Routine normal sample: "△0001" to "△9999" Emergency normal sample: "△E001" to "△E999" Routine repeat sample: "H0001" to "H9999" Emergency repeat sample: "HE001" to "HE999" Control: "Q001" to "Q999" Reagent blank sample: "R001" to "R999" Calibrator: "A001" to "A999" In the case of auto repeat, this field shall contain original sample kind/original sample No. as search keys. For the unique processing when Automation Ready is connected, refer to * Sample No. handling when Automation Ready is connected.

Q.12.1.4 Test requisition query end number

Components: |<null>^<null>^<null>^<Sample No.>|

	Set item	Set value	Maximum number of characters	Variable length	Description
Item details	Sample No.	Character string	4	Variable	The equipment shall not set the information.

Q.12.1.14 O.9.4.32 Sample information

Components: |<Measure type>^<Sample kind>^<Sample No.>^<Original sample kind>^<Original sample No.>^<Sample ID>^<Rack No.>^<Cup position>^<Sample type>|

	Set item		Set value	Maximum number of characters	Variable length	Description
Item details	Requisition sample information	Measure type	Character string	1	Variable	The host shall copy and set the measure type contained in the test requisition query message when transmitting the test requisition information message. In the case of a calibrator, reagent blank sample or control, no information shall be set. "△": Normal sample "H": Repeat sample "": Calibrator, reagent blank sample or control
		Sample kind	Character string	1	Variable	The host shall copy and set the sample kind contained in the test requisition query message when transmitting the test requisition information message. In the case of auto repeat, no information shall be set. "△": Routine sample "E": Emergency sample "A": Calibrator "R": Reagent blank sample "Q": Control For the unique processing when Automation Ready is connected, refer to * Sample No. handling when Automation Ready is connected.
		Sample No. (Repeat sample No.)	Value	4	Variable	The host shall copy and set the sample No. contained in the test requisition query message when transmitting the test requisition information message. "0001" to "9999": Routine sample "001" to "999": Emergency sample, control, reagent blank sample, calibrator "0000": Auto repeat sample For the unique processing when Automation Ready is connected, refer to * Sample No. handling when Automation Ready is connected.
	Original sample information *1	Original sample kind	Character string	1	Variable	Set the sample kind of the original sample for which repeat is conducted.*1 "△": Routine sample "E": Emergency sample In the case of normal sample, no information shall be set. Only in the case of auto repeat, the equipment shall set information.
		Original sample No.	Character string	4	Variable	Set the sample No. of the original sample for which repeat is conducted. *1 "0001" to "9999": Routine sample "001" to "999": Emergency sample In the case of normal sample, no information shall be set. Only in the case of auto repeat, the equipment shall set information.

	Set item		Set value	Maximum number of characters	Variable length	Description
Item details	Requisition sample information	Sample ID	Character string	26	Variable	On the [Requisition Format] screen, decision on whether or not to add this field and the number of digits (0 to 26) can be programmed. The host shall copy and set the sample ID contained in the test requisition query when transmitting the test requisition information message.
		Rack No.	Value	5	Variable	Decision on whether or not to use this area can be programmed on the [Online] screen. The number of digits shall be the same as the value programmed in [System Maintenance] - [Digits of Rack ID]. This area shall not be programmed for reagent blank samples, calibrators, controls or STAT samples when Automation Ready is connected, this area may not be set for normal samples/stat samples. The host shall copy and set the rack No. contained in the test requisition query message when transmitting the test requisition information message. "0001" to "9999": For 4 digits "00001" to "99999": For 5 digits
		Cup position	Value	2	Variable	Whether or not to use this area depends on setting of whether or not to use the above rack No. The host shall copy and set the cup position contained in the test requisition query message when transmitting the test requisition information message. "1" to "10": Rack sample "1" to "22": STAT sample
		Sample type	Character string	1	Fixed	Decision on whether or not to use this area can be programmed on the [Online] screen. When this area is not used, the sample type shall be treated as serum. The set value is as follows: When [System Maintenance] - [Sample Kind Mix.] is enabled, several sample types can be set on the rack. In that case, since the equipment cannot identify the sample types, [Not specified: "N"] shall be set. Acknowledgment shall be made after programming a certain sample type other than [Not specified] on the host. "△": Serum "U": Urine "X": Other 1 "Y": Other 2 "W": Whole blood "N": Not specified

*1: How to program original sample information for test requisition query of repeat sample:

The sample No. is used as key information for identifying sample information inside the equipment. When the host transmits the test requisition information message for a repeat sample, the sample No. and the sample kind of the normal sample shall be recorded on the host side to identify the repeat sample, and the sample No. and the sample kind of the repeat sample used for the normal test (hereinafter called an original sample No. and a original sample kind) shall be added when the message is transmitted. When nonuse of the sample No. is selected in [Online], the equipment shall use the sample ID as key information. In that case, the host does not need to record the sample No. and the sample kind. The method for programming original sample information varying depending on whether or not to use the sample No., is described below.

	Test requisition information message/Test requisition information message of auto repeat Description
Sample No. used	<In the case of normal sample> Copy and set the original sample No. and the original sample kind contained in the test requisition query message. <In the case of repeat sample> Set the original sample No. and the original sample kind for the repeat sample, recorded on the host. <In the case of auto repeat sample> Copy and set the original sample No. and the original sample kind contained in the test requisition query message.
No sample No. used	Copy and set the original sample No. and the original sample kind contained in the test requisition query.

When the host sets sample information using the sample information entry function according to host direction, the sample information in the test requisition query message from the equipment cannot be copied, unlike the realtime test requisition query. Therefore, the following information shall be set.

	Set item		Description
Item details	Requisition sample information	Measure type	"△": Normal sample "H": Repeat sample
		Sample kind	To transmit the test requisition information message of repeat sample, set the sample kind identical to the one for normal sample. "△": Routine sample "E": Emergency sample "P": STAT sample
		Sample No.	No information shall be set.
		Rack No.	No information shall be set.
		Cup position	No information shall be set.
		Sample ID	Set information.
		Sample type	Decision on whether or not to use this area can be programmed on the [Online] screen. When this area is not used, the sample type shall be treated as serum. The set value is as follows: "△": Serum "U": Urine "X": Other 1 "Y": Other 2 "W": Whole blood
	Original sample information	Original sample kind	No information shall be set.
		Original sample No.	No information shall be set.

P.8.1.8 Years/months (Birthdate)

Components: |<Years>^<Months>^<Birthdate>|

	Set item	Set value	Maximum number of characters	Variable length	Remarks
Item details	Years	Value	3	Variable	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. Set a value in a range of "0 to 150." For error criteria, see *1.
	Months	Value	2	Variable	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. Set a value in a range of "0 to 11." For error criteria, see *1.
	Birthdate	Value	8	Variable	The equipment shall not set the information. *2

*1: Error criteria for years/months

Pattern	Years	Months	Judgment
1	Null field	Null field	OK
2	***	Null field	OK
3	Null field	**	Not OK
4	***	**	OK

In the case of [Pattern 2], although this field shall be used, months shall be considered undefined and the equipment shall register "0."

*2: The equipment shall not save the data to a database. In addition, this data shall not be added to the result.

R.8.1.9 Patient sex

Components: |<Patient sex>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Patient sex	Character string	1	Variable	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. "M": Male "F": Female "U": Unknown

O.9.4.3 Specimen ID

Components: |<Specimen ID (collected)>^<Sample ID>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Specimen ID (collected)	Character string	32	Variable	The specimen ID shall be set (any character string). *1
	Sample ID	Character string	26	Variable	On the [Requisition Format] screen, decision on whether or not to add this field can be programmed. The number of digits for the patient sample shall be programmed on the [Requisition Format] screen (4 to 26 digits). For reagent blank samples, calibrators or controls, the ID (26 digits max.) programmed in [Calibrator Parameters] - [Calibrators] or [QC Parameters] - [Controls] shall be set.

*1: The equipment shall not save the data to a database. In addition, this data shall not be added to the result.

O.9.4.4 Instrument specimen ID

Components: |<Sample ID>^<Sample No.>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Sample ID	Character string	26	Variable	The sample ID shall be set in the same manner as that in O.9.4.3 Specimen ID.
	Sample No. (Repeat sample No.)	Character string	5	Variable	The host shall copy and set the sample No. in Q.12.1.3 Test requisition query start number when transmitting test requisition information. However, only in the case of auto repeat, "0000" shall be set. Routine normal sample: "△0001" to "△9999" Emergency normal sample: "△E001" to "△E999" Routine repeat sample: "H0001" to "H9999" Emergency repeat sample: "HE001" to "HE999" Auto repeat sample: "0000" *1 For the unique processing when Automation Ready connected, refer to *Sample No. handling when Automation Ready is connected.

*1: When sample information is set using the sample information entry function according to host direction, no sample No. does not need to be set.

O.9.4.33 Test requisition information

Components: <Test item No. 1>^<Dilution inf. 1>¥<Test item No. 2>^<Dilution inf. 2>¥ . . . ¥<Test item No. n>^<Dilution inf. n>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Test item	Value	3	Variable	Set a value in a range of "001 to 999" based on the setting in [Online]-[Online Test No.]. *1 The equipment shall set the online test No. corresponding to transfer data in R.10.1.4 Result, to the result message. For LIH tests, the online test No. instead of the character string shall be set.
	Dilution inf.	Value	1	Variable	Whether or not to add this field to the normal sample can be programmed on the [Online] screen. The repeat sample shall use this field, regardless of the above parameter setting. "0": Normal "1": Diluted "2": Concentrated

*1: Supplementary explanation of test items

(1) Sample information for calculated tests

- When the test No. of calculated test is included in the test item in the test requisition information message transmitted by the host, the equipment shall ignore this test item. To measure calculated tests, measure all calculated tests programmed in [Specific Test Parameters] - [Calculated Tests]. When all measured data for calculated tests for the sample are prepared, calculation and transfer shall be done.
- When any one of calculated tests has not been measured, or when a calculation-disabled data flag (such as "?△") is attached although the measure is conducted, a calculated test result shall not be transferred.

(2) Test items not to be measured

When the equipment receives a test item in the test requisition information-related message under the following conditions, the test item shall not be measured.

- An LIH test item exists for sample types (urine, whole blood, etc.) for which LIH is not to be measured.
- An ISE (Na, K, Cl) test item exists for sample types (whole blood, etc.) for which ISE is not to be measured.
- An test item which is not contained in online test Nos. in [Online] exists.

- There is a test item which is not included in a group of tests in [Common Test Parameters] - [Group of Tests].
- There is a test item for which [No] is selected for operation in each item in [Specific Test Parameters].
- There is a sample blank test item which only contains a blank item but not a color item.
- The dilution inf. is other than 0, 1 or 2.
- The dilution inf. is other than 0 for LIH, ISE and whole blood tests.

(3) LIH test

Serial communication using RS-232C interface of the equipment shall allow LIH measure on the following basis, according to the "LIH Reagent" settings in [Common Test Parameters] - [Group of Tests].

LIH reagent	Description
All Select	LIH measure shall be performed on samples for which sample information received from the host does not contain LIH tests.
Selectable	LIH measure shall be performed only on samples for which sample information received from the host contain LIH tests.

To measure LIH items when using a LAN system compliant with this specification, set the LIH test item number without depending on the LIH reagent settings.

(4) No Item Selection

If a message without any item setting in “Test requisition information” field is received, samples shall be registered without any Item Selection Information by the instrument. No analysis or data input for these samples shall be conducted.

R.10.1.4 Result

Components: |<Test item>^<Result>^<Result type>^<RB result type>^|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Test item	Character string	3	Fixed	A value in a range of "001 to 999" shall be set based on the setting in [Online]-[Online Test No.]. For LIH tests, the three result records shall be set to the following character string corresponding to lipemia, icterus and hemolysis. "LIP": Lipemia "ICT": Icterus "HEM": Hemolysis
	Result	Value	10	Variable	See the following supplementary explanation.
	Result type	Character string	1	Variable	Result types transferred from the equipment contain a CONC value (concentration value), OD value (absorbance value) and LIH test. When the test is unprocessed, such result can be transferred. The type shall be set as follows. "C": CONC value "O": OD value "n": LIH test "": Unprocessed
	RB result type	Value	1	Variable	For the reagent blank sample result, the measuring start point and the measuring end point shall be transferred. When the data to be transferred is a measuring start point, "1" shall be set and when the data is a measuring end point, "2" shall be set. "": Measure samples other than reagent blank sample "1": Measuring start point "2": Measuring end point

*Supplementary explanation of results

(1) Result format

A. CONC value/OD value

-123.456

-123.45

The result shall be set using up to 10 digits including numbers, a decimal point and a minus sign.
However, any spaces shall not be put between a symbol and a number.
A negative OD value can be transferred.
The OD value shall use all digits. (The maximum number of effective digits shall be expressed using up to 10 digits.)

B. LIH data
A value from 0 to 6 shall be set according to the LIH data result described in the right.

Result value
"0": Normal
"1": +
"2": ++
"3": +++
"4": ++++
"5": +++++
"6": ABN
"7": ABN H
"8": ABN L
"9": Not yet measured

R.10.1.7 Data flag

Components: |<Data flag 1>¥<Data flag 2>¥<Data flag 3>¥<Data flag 4>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Data flag	Character string	2×4	Variable	0 to 4 data flags can be set. When two or more data flags are present, a repeat delimiter shall be used between data flags. When there is no data flag, the field shall be a null field. For information about data flags, see Appendix A.1 Data Flag.

R.10.1.9 Quick type

Components: |<Quick type>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Quick type	Character string	1	Variable	Quick result shall be output when the sample and the test are compliant with quick result output. "Q": The result is a quick result. "": The result is other than a quick result.

R.10.1.16 CAL/Control/RB number

Components: |<CAL/Control/RB number>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	CAL/Control/RB number	Value	3	Variable	The measured calibrator, control or reagent blank sample No. shall be set. "1 to 200": Calibrator "1 to 100": Control "1 to 2": Reagent blank sample Reagent blank samples shall be reserved.

R.10.1.17 Lot/bottle No.

Components: |<R1(R1-1) Lot No.>^<R1(R1-1) Bottle No.>^<R2(R2-1) Lot No.>^<R2(R2-1) Bottle No.>^<R1(R1-2) Lot No.>^<R1(R1-2) Bottle No.>^<R2-2 Lot No.>^<R2-2 Bottle No.>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Lot/bottle No.	Value	4×8	Variable	The reagent lot No. and the bottle No. used for measure shall be set. A value shall be set according to the above components, depending on the used reagent kind. No information shall be set for unused reagent fields.

*Supplementary explanation of lot/bottle No.

For transmission of advanced RB/CAL/QC results in serial communication using RS-232C interface of the equipment, one of the following can be selected depending on the equipment setup:

- Divide messages by measured lot/bottle No. and transmit a result message for RB/CAL/QC.
- Bring all measured lot/bottle Nos. into one message and transmit a result message for RB/CAL/QC.

This LAN-supported specification shall not allow messages to be divided by lot/bottle No., depending on the equipment setup.

R.10.1.18 Unit No./Cuvette

Components: |<Unit No.>^<Cuvette>|

	Set item	Set Value	Maximum number of characters	Variable length	Remarks
Item details	Unit No.	Value	1	Variable	The Unit No. used for measure shall be set. '1' : Unit No.1 or ISE '2 - 4' : Unit No. 2 - 4 Only for Calculation Tests, no information shall be set.
	Cuvette	Value	1	Variable	The Cuvette used for measure shall be set. "0' : Inner or Cell 1 '1' : Outer or Cell 2 Only for Calculation Tests, no information shall be set.

* Sample No. handling with Automation Ready is connected

With Automation Ready is connected, normal samples and emergency samples shall be mixed and loaded on the normal racks, sample No's of the samples on the normal racks shall be uniquely operated. When this operation is conducted, the parameter of AU5800 shall be as follows as the precondition.

- Sample Information Receipt (commonly normal samples): Real Time
- Sample Item Selection Method (normal samples/emergency samples): Sample ID

AU5800 transmits all the sample No's and by sample kinds by the normal type sample request message (R△△) without any setting to an outside computer, .determines whether they are normal samples/stat samples by the by sample type of the normal sample response message (S△△) from the outside computer, and conducts analyses. the details of sample No. shall be shown on the next page.

Where the following case is applicable, there shall be no change in sample No. handling. Sample No's shall be uniquely operated only for samples without any setting of by sample kind/sample No.

- Samples on emergency racks (samples with by analysis type "E" of R△△ message)
- Re-testing samples (samples of by analysis type "H" of R△△ message)
- Data Message (D△△ message)

Sample No. handling of normal samples on normal racks:

No setting shall be conducted by AU5800 at the point of R△△ message transmission without any by sample kind or sample No. determined.

In D△△ message, the determined by sample kind and sample No. shall be set and transmitted to an outside computer.

Message type	Field	Components	Set Value	Remarks
R△△ Test requisition query	Q.12.1.3 Test requisition query start number	null	Same as the normal operation	Same as the normal operation
		Sample ID		
		Measure type, Sample kind, Sample No.	"△" shall be set.	No by sample kind or sample No. shall be set. Only by analysis type (△:normal)shall be set.
	Q.12.1.14 Sample information	Measure type	Same as the normal operation	Same as the normal operation
		Sample kind	No setting	No by sample kind or sample No. shall be set.
		Sample No.		
		Original sample kind	Same as the normal operation	Same as the normal operation
		Original sample No.		
		Sample ID		
		Rack No.		
		Cup position		
		Sample type		
D△△ Result	Same as the normal operation			The determined sample No. shall be set and transmitted to an outside computer.

Samples shall be identified by the sample ID of R△△ message by the outside computer, and by sample kind (normal/emergency) shall be determined and set. No sample No. shall be set.

Message type	Field	Components	Set Value	Remarks
S△△ Test requisition information	O.9.4.32 Sample information	Measure type	Same as the normal operation	Same as the normal operation
		Sample kind	"△": Routine sample "E": Emergency sample	By sample kind (normal/emergency) shall be set. No sample No. shall be set.
		Sample No.	No setting	
		Original sample kind	Same as the normal operation0	Same as the normal operation
		Original sample No.		
		Sample ID		
		Rack No.		
		Cup position		
		Sample type		
	O.9.4.4 Instrument specimen ID	Sample ID	Same as the normal operation	Same as the normal operation
		Sample No. (Measure type, Sample kind, Sample No.)	"△△": Routine sample "△E": Emergency sample	By analysis type and by sample kind (normal/emergency) shall be set. No sample No. shall be set.

< Precaution for this operation >

As sample IDs set in R△△ message vary, it is required that sample data be managed only by sample IDs by the outside computer.

7.6. Delimiter Details

(1) Record Delimiter

0x0D[CR] shall be suffixed to each record, as described in 7.1 (2) Record.

(2) Field Delimiter

A field delimiter shall be used to delimit fields in a record. Fig. 7.6.1 shows the record shown in Fig. 7.1.1: Message Concept, which is expressed using field delimiters.

P|1|0123456789|.....||||[CR]

Fig. 4.2.1: Record using Field Delimiters

The first field of the record shall be a record type ID and fields which do not contain any information shall be null fields. For example, when the 4th to the last fields are all null, these null fields can be omitted. Fig. 7.6.2 shows an example. When information is set in a field, null fields before the field cannot be omitted.

P|1|0123456789[CR]

Fig. 7.6.2: Null Field Omission

(3) Repeat Delimiter

When several data of the same type are contained in a field, repeat delimiters shall be used to delimit the data. For example, in a data flag field of this specification, any number [from 0 to 4] of data can be set. Fig. 7.6.3 shows an example of using repeat delimiters.

When three data flags are used:
|ba¥Ph¥P |

Fig. 7.6.3: Example of Using Repeat Delimiters

(4) Component Delimiter

When a field is composed of several information, component delimiters shall be used to delimit the information. For example, the birthdate field of this specification shall be composed of "years," "months" and "birthdate." Fig. 7.6.4 shows an example of using component delimiters.

|Years^Months^Birthdate|
When Years = 27, Months = 6, Birthdates =
1982/01/30:
|27^6^19820130|

Fig. 7.6.4: Example of Using Component Delimiters

(5) Escape Delimiter

Delimiters can be used in a field as data like a usual character string, by using escape delimiters. To do so, place characters corresponding to delimiters between escape delimiters. Table 7.6.5 shows a method of using escape delimiters when delimiters used in a message are any listed in Table 7.3.1 Delimiter List.

Table 7.6.5: Escape Delimiters

Delimiter	Character string to be used in a field	Escape delimiter used
Field delimiter	|	&F&
Repeat delimiter	\	&R&
Component delimiter	^	&S&
Escape delimiter	&	&E&

8. Application Level

This section defines the method for implementing the functions based on messages defined on the message level.

8.1. Realtime Test Requisition Query/Test Requisition Query Function of Auto Repeat

This function can be implemented during measure. The equipment shall transmit a test requisition query start notification message to the host and notify the host of the start of realtime test requisition query at measure start. In this specification, a state where the realtime test requisition query is ready is called a state where the realtime test requisition query session is open.

In a state where the session is open, the equipment shall transmit a test requisition query message to the host, the host shall return a test requisition information message to the equipment.

At measure end or when a communication error occurs, the equipment shall transmit a test requisition query end notification message to the host to terminate the session, and terminate the realtime test requisition query/test requisition query of auto repeat.

(1) Message Transmission/Reception Timing

This section describes the message transmission/reception timing and processing. Table 8.1.1 shows the message transmission/reception timing. Fig. 8.1.1 shows the normal sequence.

Table 8.1.1: Message Transmission/Reception Timing

Message type	Message Transmission/Reception Timing	Normal state processing
RB△ [Sample information query start]	It shall be transmitted at measure start in STANDBY mode.	The test requisition query session shall start and R△△/Rh△ shall be continuously transmitted.
R△△*1[Test requisition query of normal sample (Routine/Emergency)]	It shall be transmitted when a sample cup is detected.	Shall be transferred to S△△ receiving process
Rh△ [Test requisition query of auto repeat (Routine/Emergency)]	It shall be transmitted in the cup position order as soon as all results of the rack where the appropriate sample has been loaded are fixed.	Shall be transferred to Sh△ receiving process.
S△△*1[Test requisition of normal/repeat sample information (Routine/Emergency)]	It can be received within a specified time (T2) after the R△△*1 message has been transmitted.	Subsequent R△△/Rh△ and RE△ shall be continuously transmitted.
Sh△ [Test requisition of auto repeat sample information (Routine/Emergency)]	It can be received within a specified time (T2) after the Rh△ message has been transmitted.	Subsequent R△△/Rh△ and RE△ shall be continuously transmitted.
RE△ [Sample information query end]	It shall be transmitted when the equipment shifts in either of the following operation modes: - From OPERATION mode to STANDBY mode - From OPERATION mode to STOP mode	The test requisition query session shall be terminated.
	It shall be transmitted even when communications are disrupted due to an online communication error.	

*1 : R△△ and Rh△ may be mixed in the same session and transmitted.

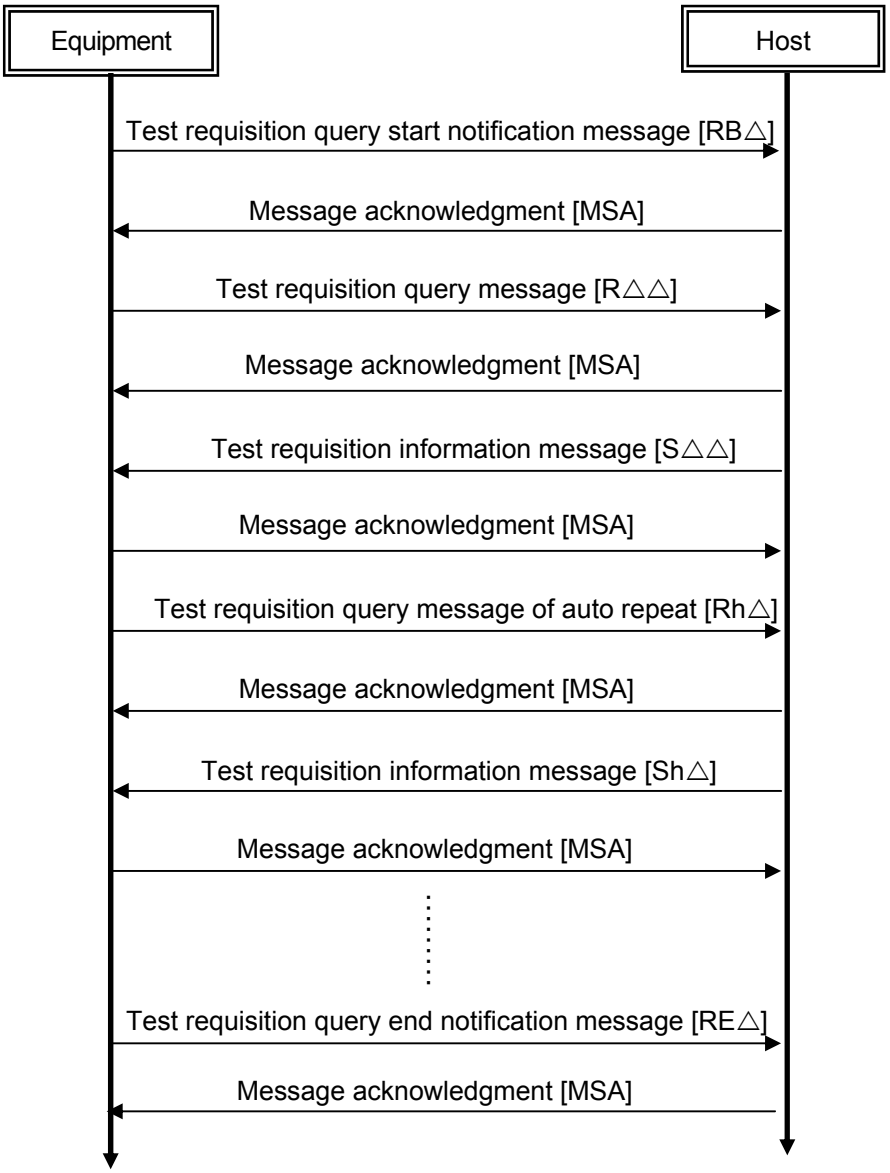

Fig. 8.1.1: Normal Sequence of Realtime Test Requisition Query/Test Requisition Query of Auto Repeat

(2) Communication Error Control

Whether to terminate or continue the session when a communication error occurs can be selected depending on the value set in [Online] - [Protocol] - [T.R.I Receive Error Control].

1) When [Stop] is selected in T.R.I Receive Error Control

When Alarm No. 6100: Online Connection Error, Alarm No. 6101: Online Error or Alarm No. 6102: Online Format Error occurs in a state where the realtime test requisition query session is open, the equipment shall terminate the session and transmit the test requisition query end notification message to the host. However, when an error occurs while the test requisition query start notification message is transmitted, the equipment shall consider the session unopened and not transmit the test requisition query start notification message. Fig. 8.1.2 shows the sequence when an error occurs.

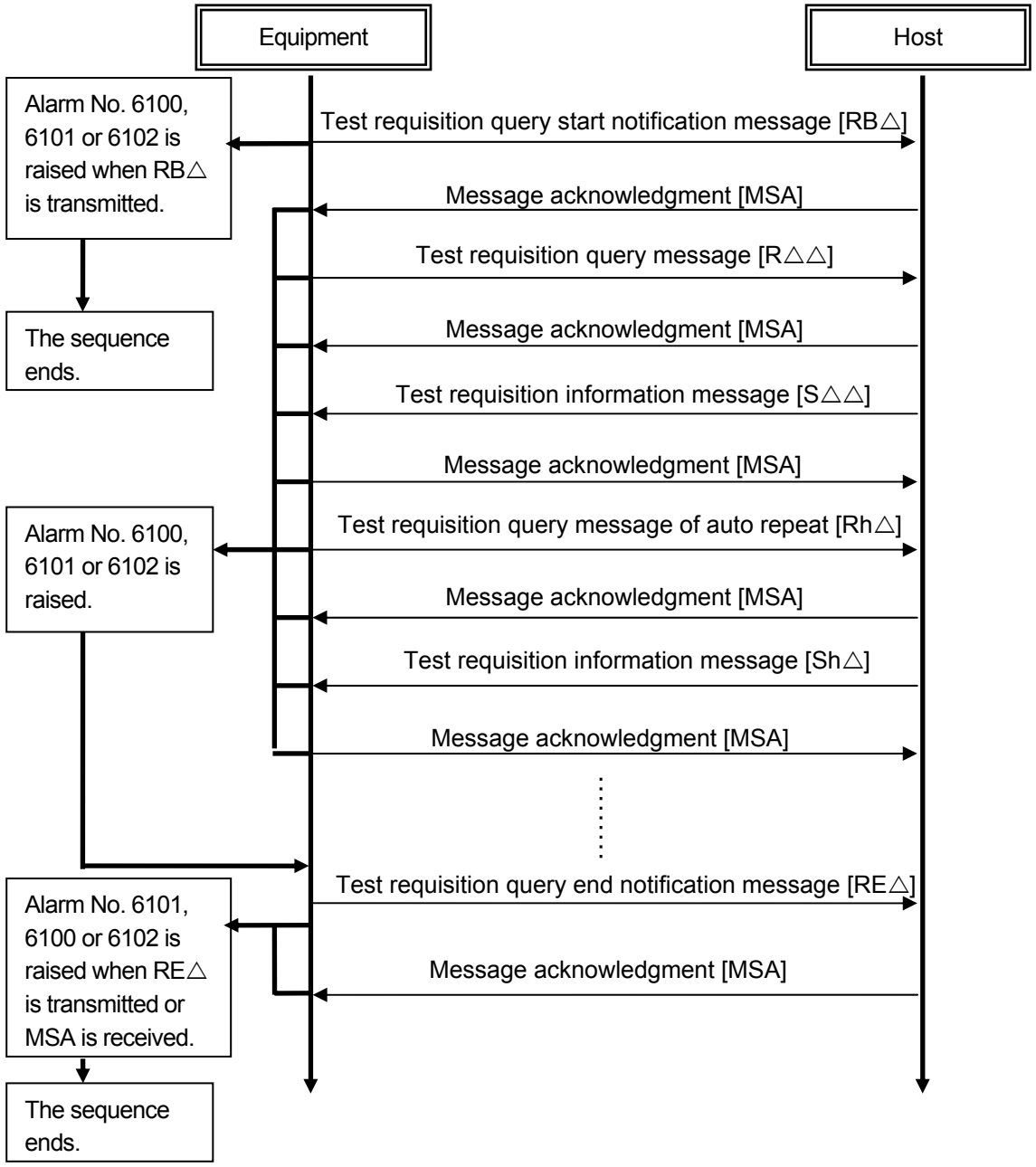

Fig. 8.1.2: Sequence when [Stop] is selected in T.R.I Receive Error Control

2) When [Continue] is selected in T.R.I Receive Error Control

Even when Alarm No. 6100: Online Connection Error or Alarm No. 6101: Online Error occurs in a state where the realtime test requisition query session is open, the equipment shall not terminate the session and transmit a message using a trigger to transmit the test requisition query message as long as the port is connected.

In addition, when an error occurs while the equipment transmits the test requisition query start notification message or receives message acknowledgment, the equipment shall consider the session open and transmit the test requisition query message.

However, when the error code for Alarm No. 6101: Online Error is [62] or Alarm No. 6102: Online Format Error occurs, the equipment shall consider it unnecessary to transmit/receive messages due to a grammatical error in the message, and perform the same sequence as when [Stop] is selected in 5.1.1 (1). Fig. 8.1.3 shows the sequence when an error occurs.

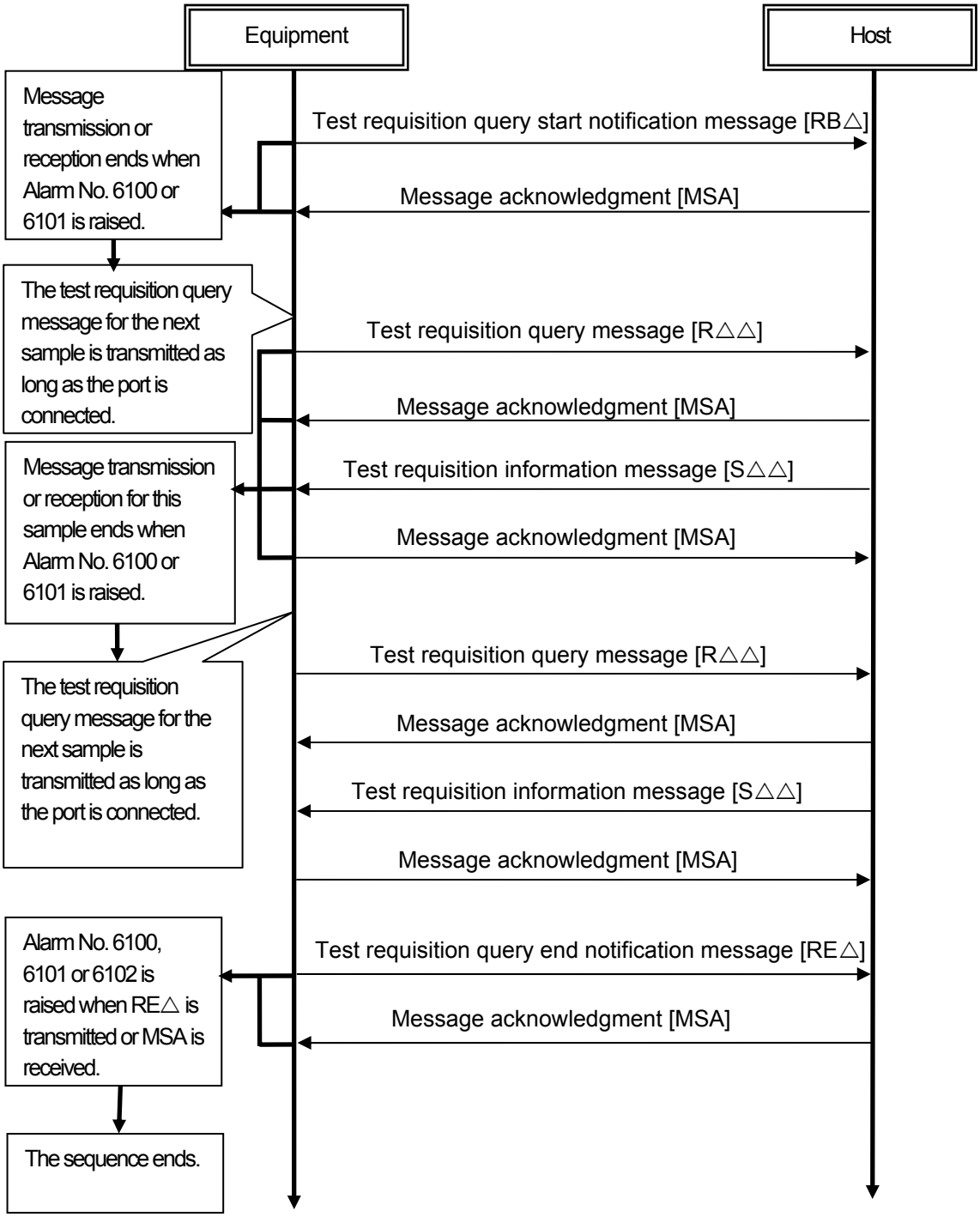

Fig. 8.1.3: Sequence when [Continue] is selected in T.R.I Receive Error Control

(3) Processing on the equipment when sample information is received

This section describes the message transmission timing and information to identify sample information.
The test requisition query message transmitted by the equipment shall provide two types of key information to identify sample information.

- Sample No.
- Sample ID

When barcode operation is selected as the sample test requisition, the sample No. and sample ID shall be transmitted. However, when nonuse of the sample ID is selected, only the sample No. shall be transmitted. The sample No. is information to manage a sample inside the equipment. When the host does not manage the sample ID in conjunction with sample information, the equipment may not be able to properly transmit the test requisition information message. In this specification, it is recommended to use the sample ID. Hereinafter, when only the sample No. is used as key information, it is called "Sample No. request." When the sample ID is used along with the sample No., it is called "Sample ID request." Table 8.1.1 shows the message transmission/reception timing.

Measurement parameter settings shall select either the sample No. or sample ID as key information. Key information to identify sample information for each measurement parameter setting is shown for normal sample, repeat sample and auto repeat.
While test requisition information receive can be set on the [Online] or [Requisition Format] screen, test requisition can be set on the [Analysis mode] screen.

Table 8.1.2: Sample Identification Information

Measurement parameter settings		Key information	Sample identification information used for transmission/reception	
Sample Type	Test requisition		Test requisition query message	Test requisition information message
Normal Sample	Sequential (with ID reading)	Sample No. request	Sample No, sample ID	Sample No.*1, sample ID*2
	Sequential (without ID reading)	Sample No. request	Sample No.	Sample No.*1
	Rack No.	Sample No. request	Sample No.	Sample No.*1
	Sample ID (sample No. used)	Sample ID request	Sample No, sample ID	Sample No.*1, sample ID*2
	Sample ID (no sample No. used)	Sample ID request	Sample No, sample ID	Sample No.*1, sample ID*2
Repeat Sample	Sequential (with ID reading)	Sample No. request	Repeat sample No., Sample ID	Repeat sample No.*1,Sample ID*2, Original sample No.*3
	Sequential (without ID reading)	Sample No. request	Repeat sample No.	Repeat sample No.*1,Original sample No.*3
	Rack No.	Sample No. request	Repeat sample No.	Repeat sample No.*1,Original sample No.*3
	Sample ID (sample No. used)	Sample ID request	Repeat sample No., Sample ID	Repeat sample No.*1,Sample ID*2, Original sample No.*3
	Sample ID (no sample No. used)	Sample ID request	Repeat sample No., Sample ID	Repeat sample No.*1,Sample ID*2
Auto Repeat	Sequential (with ID reading)	Sample No. request	(Original) sample No.	Original sample No.*1
	Sequential (without ID reading)	Sample No. request	(Original) sample No.	Original sample No.*1
	Rack No.	Sample No. request	(Original) sample No.	Original sample No.*1
	Sample ID (sample No. used)	Sample ID request	(Original) sample No., Sample ID	Original sample No.*1 , Sample ID*2
	Sample ID (no sample No. used)	Sample ID request	(Original) sample No., Sample ID	Original sample No.*1 , Sample ID*2

*1: Sample No. of Item Selection Request Message and sample No. of Item Selection Information Message, re-testing sample No. and re-testing sample No. the original sample No. (sample No. at the initial testing) and the original sample No. shall be the same.
*2: Sample ID of Item Selection Request Message and sample ID of Item Selection Information Message shall be the same. Or for sample ID of response information, complete carry space [20h] shall be set. If neither is applicable, Alarm 6136 Online Mismatch shall be issued.
*3: For the original sample No., the sample No. at the initial testing of the sample to be re-tested shall be set.

8.2. Realtime Result Transfer Function

This function can be implemented during measure. The equipment shall transmit a result transfer start notification message to the host and notify the host of the start of realtime result transfer at measure start. In this specification, a state where the realtime result transfer is ready is called a state where the realtime result transfer session is open.

In a state where the session is open, the equipment shall transmit a result message to the host, and the host shall return message acknowledgment to the equipment.

At measure end or when a communication error occurs, the equipment shall transmit a result transfer end notification message to the host to terminate the session, and terminate the realtime result transfer.

(1) Message Transmission/Reception Timing

This section describes the message transmission/reception timing and processing. Table 8.2.1 shows the message transmission/reception timing. Fig. 8.2.1 shows the normal sequence.

Table 8.2.1: Message Transmission/Reception Timing

Message type	Transmission/reception timing/conditions	Normal state processing
DB△ [Result transfer start notification]	It shall be transmitted when the equipment shifts to "MEASURE 1" at measure start in STANDBY mode. However, when DB△ has been transmitted and the result transfer session is open in 5.3 Batch Online Result Transfer Function, the equipment shall consider it unnecessary to re-transmit DB△, and not transmit DB△ at this time. The equipment shall continuously transmit the subsequent result message.	The result transfer session shall start and D△△ shall be continuously transmitted.
D△△ [Result]	It shall be transmitted in sequence when all test requisition results of the measured sample are prepared and the equipment judges the sample has been measured.	Subsequent D△△ and DE△ shall be continuously transmitted.
DE△△ [Result transfer end notification]	It shall be transmitted when the equipment shifts in either of the following operation modes or subsequently judges all D△△ to be transmitted have been transmitted: - From OPERATION mode to STANDBY - From OPERATION mode to STOP It shall be transmitted when the session is canceled due to an online communication error. However, when DB△ has been transmitted and the result transfer session is open in 5.3 Batch Online Result Transfer Function, the equipment shall not transmit DE△ at this time because result transfer is not yet complete.	The result transfer session shall be terminated.

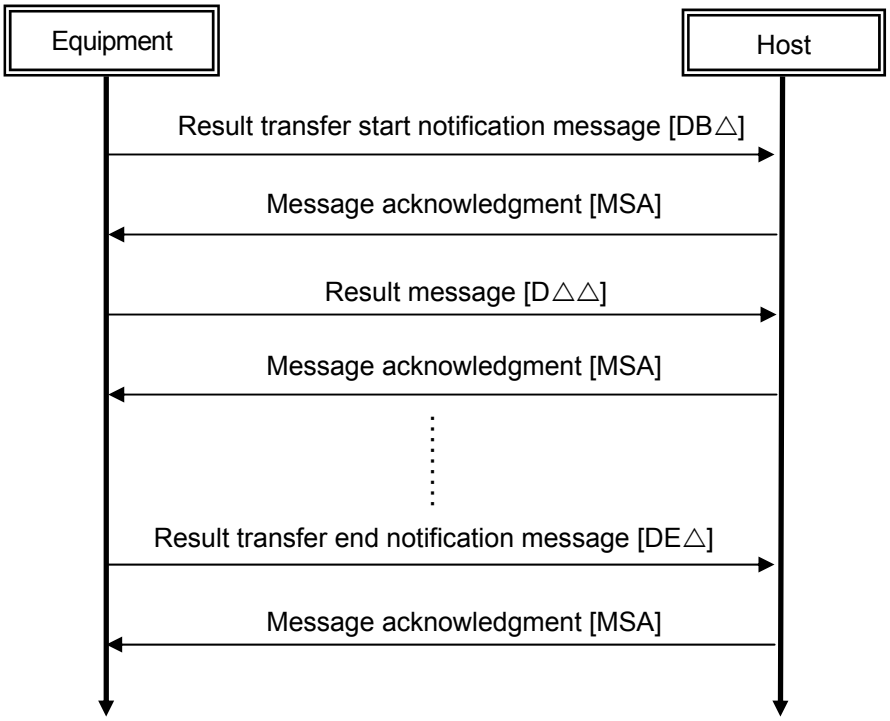

Fig. 8.2.1: Normal Sequence of Realtime Result Transfer

(2) Communication Error Control

Whether to terminate or continue the session when a communication error occurs can be selected depending on the value set in [Online] - [Protocol] - [Results Transfer Error Control].

1) When [Stop] is selected in Results Transfer Error Control

When Alarm No. 6100: Online Connection Error, Alarm No. 6101: Online Error or Alarm No. 6102: Online Format Error occurs in a state where the realtime result transfer session is open, the equipment shall terminate the session and transmit the result transfer end notification message to the host. However, when an error occurs while the result transfer start notification message is transmitted, the equipment shall consider the session unopened and not transmit the result transfer end notification message. Fig. 5.2.2 shows the sequence when an error occurs.

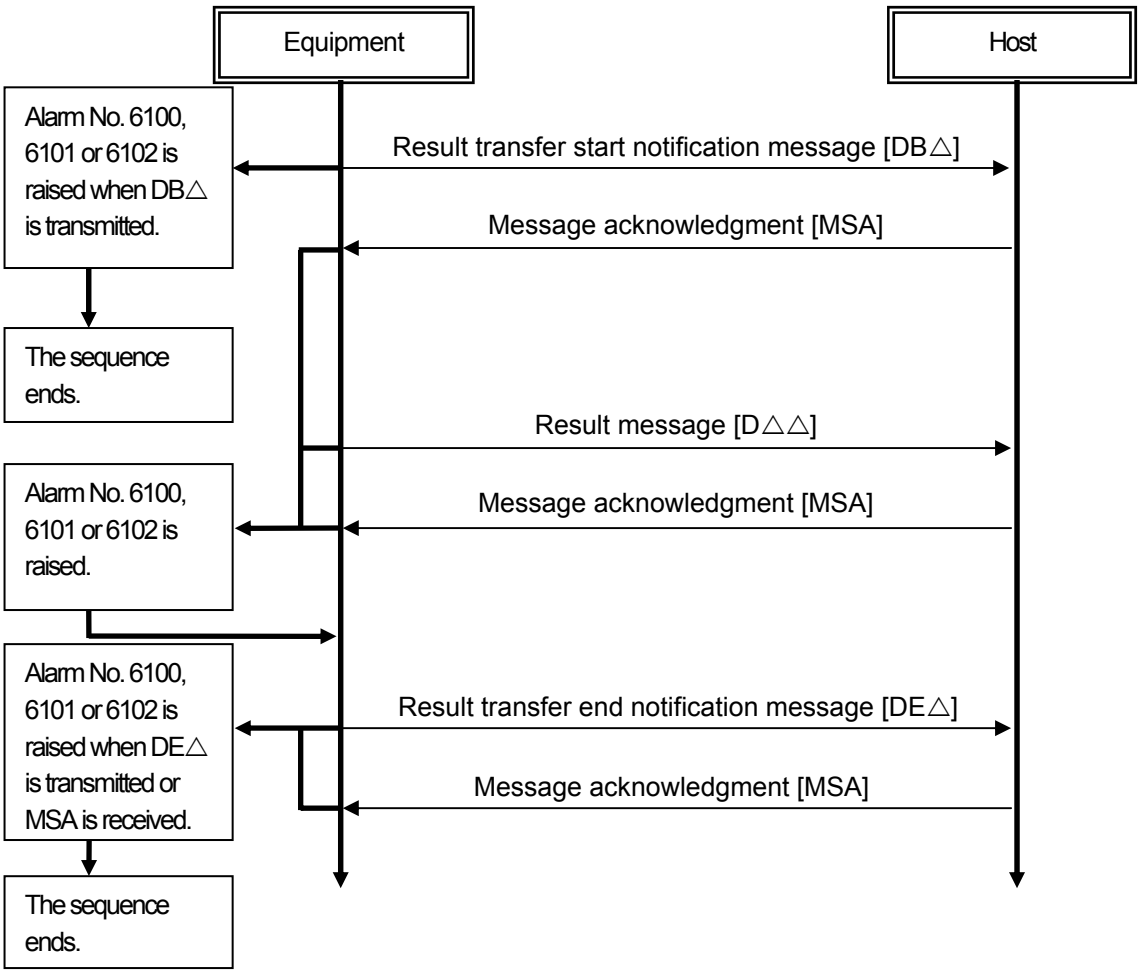

Fig. 8.2.2: Sequence when [Stop] is selected in Results Transfer Error Control

2) When [Continue] is selected in Results Transfer Error Control

Even when Alarm No. 6100: Online Connection Error or Alarm No. 6101: Online Error occurs in a state where the realtime result transfer session is open, the equipment shall not terminate the session and transmit a message using a trigger to transmit the result message as long as the port is connected. In addition, when an error occurs while the equipment transmits the result transfer start notification message or receives message acknowledgment, the equipment shall consider the session open and transmit the result message. However, when the error code for Alarm No. 6101: Online Error is [62] or Alarm No. 6102: Online Format Error occurs, the equipment shall consider it unnecessary to transmit/receive messages due to a grammatical error in the message, and perform the same sequence as when [Stop] is selected in 8.2.2 (1).

Fig. 8.2.3 shows the sequence when an error occurs.

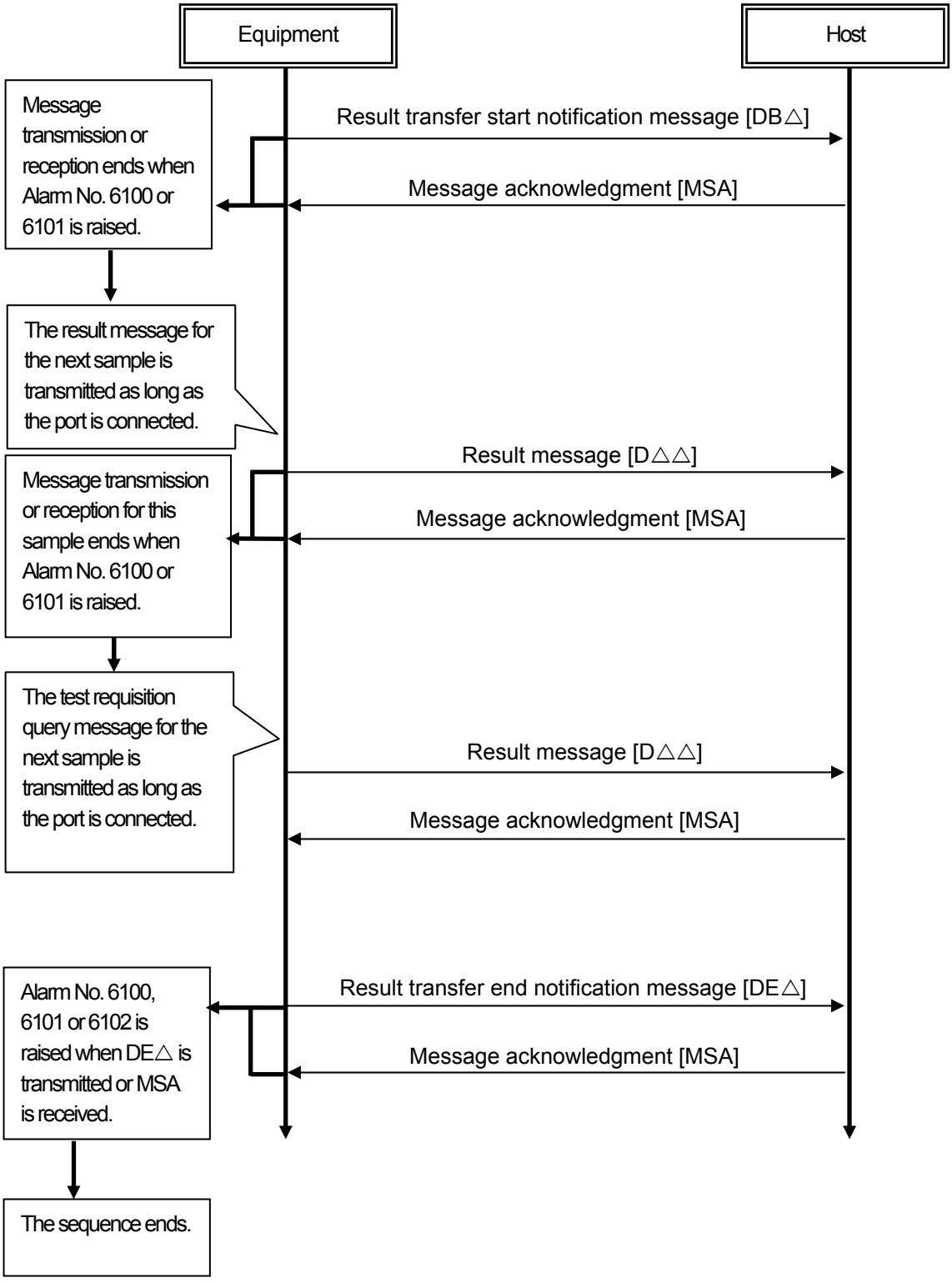

Fig. 8.2.3: Sequence when [Continue] is selected in Results Transfer Error Control

8.3. Batch Online Result Transfer Function

This function can be implemented on the [Sample Manager] screen. It can be implemented regardless of the equipment mode. For the sequence other than when the message types vary, see 5.2 Realtime Result Transfer Function because the sequence of batch online result transfer is similar to that of realtime result transfer.

(1) Message Transmission/Reception Timing

This section describes the message transmission/reception timing and processing. Table 8.3.1 shows the message transmission/reception timing. For the batch online analysis result output normal sequence, refer to the realtime analysis result output normal sequence.

Table 8.3.1: Message Transmission/Reception Timing

Message type	Transmission/reception timing/conditions	Normal state processing
DB△ [Result transfer start notification]	It shall be transmitted when transmission starts on the [Sample Manager] screen. However, when DB△ has been transmitted and the result transfer session is open in 5.4 Realtime Result Transfer Function, the equipment shall consider it unnecessary to re-transmit DB△, and not transmit DB△ at this time. The equipment shall continuously transmit the subsequent result message.	The result transfer session shall start and DM△ shall be continuously transmitted.
DM△ [Result]	It shall be transmitted in sequence, for the sample in the range specified on the [Sample Manager] screen.	Subsequent DM△ and DE△ shall be continuously transmitted.
DE△ [Result transfer end notification]	It shall be transmitted for the sample in the range specified on the [Sample Manager] screen, after the final sample has been transmitted. It shall be transmitted when the session is forcibly terminated on the [Sample Manager] screen. It shall be transmitted when communications are disrupted due to an online communication error. However, when DB△ has been transmitted and the result transfer session is open in 5.4 Realtime Result Transfer Function, the equipment shall not transmit DE△ at this time because result transfer is not yet complete.	The result transfer session shall be terminated.

(2) Communication Error Control

See 8.2 Realtime Result Transfer Function because communication error control for batch online result transfer is similar to that of realtime result transfer.

8.4. Sample Information Entry Function according to Host Direction

Unlike the realtime test requisition query function that enables the equipment to transmit the test requisition query message, this function shall allow the host to transmit the test requisition information message to the equipment at its discretion and the equipment to enter sample information. However, the host shall judge whether or not the equipment is ready to receive the test requisition information message, based on the equipment state transmitted by the equipment. The test requisition information message received in a state where the equipment is not ready to receive the message shall be discarded.

This function shall also apply to normal /repeat sample. To implement auto repeat, see 5.1 Realtime Test Requisition Query/Test Requisition Query Function of Auto Repeat. Fig. 5.4.1 shows the normal sequence.

(1) Message Transmission/Reception Timing

The equipment shall notify Host the timing of Item Selection Information Message properly received by the equipment by transmitting Mode IDs to Host in the equipment status output.

Table 8.4.1 shows mode IDs where the equipment properly receives and enters the test requisition information message. The mode ID shall be a field for equipment state messages. For information about the equipment state, see 8.5 Equipment State Transfer Function.

Although the equipment state is defined based on [EQU - Equipment Detail Segment] for HL7, the state where the equipment can receive the test requisition information message cannot be completely defined.

Therefore, the mode ID is defined as a unique standard and shows the reception possibility state of the test requisition information message. For information about the mode ID, see Table 5.5.3: Mode ID.

Table 8.4.1: Reception Enabled Mode ID

Mode ID	Mode text	Yes: Reception enabled No: Reception disabled
"EDPR"	"END OF PROCESS"	No
"CNRS"	"CAN NOT RECEIVE SAMPLE"	No
"ENRS"	"ENABLE TO RECEIVE SAMPLE"	Yes

*Supplementary explanation

As shown in the above table, the sample information entry function according to host direction shall determine whether or not to transmit the test requisition information message based on the equipment state. When the equipment state port (see Table 4.1.2: Functions and Corresponding Ports) is disconnected, do not transmit the test requisition information message because the current equipment state is uncertain.

Fig. 8.4.1 shows the normal sequence.

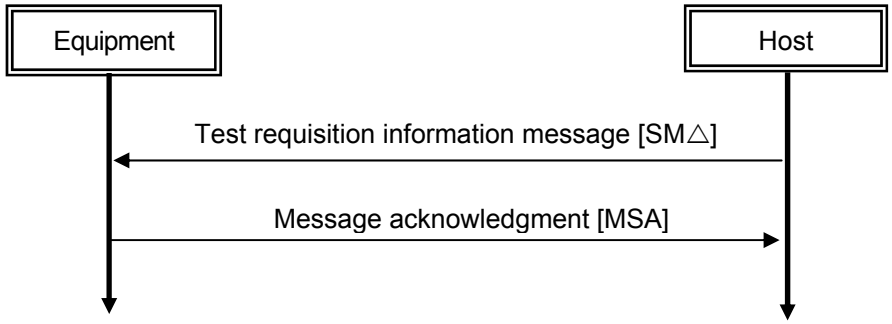

Fig. 8.4.1: Normal Sequence of Test Requisition Information Entry Function according to Host Direction

(2) Communication Error Control

Unlike the realtime functions with sessions, the host can transmit the test requisition information message even after an error occurs, as long as the equipment state/mode ID can be received, regardless of the value set in [Online] - [T.R.I Receive Error Control].

When the host receives an acknowledgment code other than [AA] in message acknowledgment in reply to the test requisition information message, it shows the equipment cannot properly enter sample information. Remove the problem causing sample information not to be entered, and then re-transmit the test requisition information message about the sample that failed to be entered.

*Supplementary explanation

The equipment shall not transmit the reason why sample information failed to be entered, to the host. See the alarm on the equipment screen and identify the problem. For more information about alarms, see Appendix A.4 Alarm List.

(3) Processing on the equipment when sample information is received

This function shall provide the following entry types of sample information when the test requisition information message is received:

- New entry
- Overwrite entry

Table 8.4.2 shows the entry method.

Table 8.4.2: Entry Method

When test requisition information is received	Entry method	Description
Sample information contained in the received test requisition information message is not entered in the current index.	New entry	The sample No. of which sample information has not been entered shall be used to determine the sample No. to be entered, and enter new information about the test requisition information message.
Sample information contained in the received test requisition information message is entered in the current index.	Overwrite entry	The sample No. to which sample information corresponds shall be overwritten with information about the test requisition information message.

To correct the information once transmitted, transmit the corrected test requisition information message.

8.5. Equipment State Transfer Function

This function shall determine and transmit the equipment operation mode or screen operations to the host based on the equipment state defined based on [EQU - Equipment Detail Segment] for HL7. The host shall judge whether or not to allow the equipment to perform tasks based on the received equipment state message. In addition, the mode ID shall define whether or not the equipment is ready to receive the test requisition information message.

(1) Message Transmission/Reception Timing

At the time of equipment status or mode ID change, messages shall be transmitted.

The equipment state shall be determined based on the equipment operation mode and screen operations. Table 5.5.1 shows equipment states and table8.5.1 shows the method for determining the equipment state.

Table 8.5.1: Equipment State

Operation mode	Equipment state	Remarks
INITIAL	"IN"	The equipment state shall be basically determined according to operation mode but determined by taking priority over operation mode in the following operations: - States when the equipment is editing parameters - When the equipment is outputting data on the [External data Management] screen - When the equipment is loading/saving a file on the [File Management] screen "CO" shall be prioritized. - "CL" shall be prioritized when the equipment is replacing the index to another index.
WARM-UP	"IN"	
STANDBY	"ID"	
WARM-UP to STANDBY	"ID"	
STANDBY to MEASURE 1	"ID"	
STANDBY to MEASURE 2	"ID"	
MEASURE 1	"OP"	
MEASURE 1 to MEASURE 2	"OP"	
MEASURE 1 to PAUSE	PA'	
MEASURE 1 to STOP	"ES"	
MEASURE 1 to MEASURE 1	"OP"	
MEASURE 2	"OP"	
MEASURE 2 to MEASURE 1	"OP"	
MEASURE 2 to PAUSE	"PA"	
MEASURE 2 to STOP	"ES"	
MEASURE 2 to MEASURE 2	"OP"	
PAUSE	"PD"	
PAUSE to MEASURE 1	"PD"	
PAUSE to MEASURE 2	"PD"	
STOP	"ES"	
RESET	"IN"	
END	null	
WARM-UP W1	"OP"	
STANDBY W1	"OP"	
WARM-UP W2	"OP"	
STANDBY W2	"OP"	
STANDBY PHOTOCAL	"OP"	
WARM-UP MAINTENANCE	"CO"	
STANDBY MAINTENANCE	"CO"	
STOP MAINTENANCE	"CO"	
STOP DIAG	"CO"	

The mode ID shall be determined based on the equipment operation mode and sample entries.

Fig. 8.5.1 shows the normal sequence.

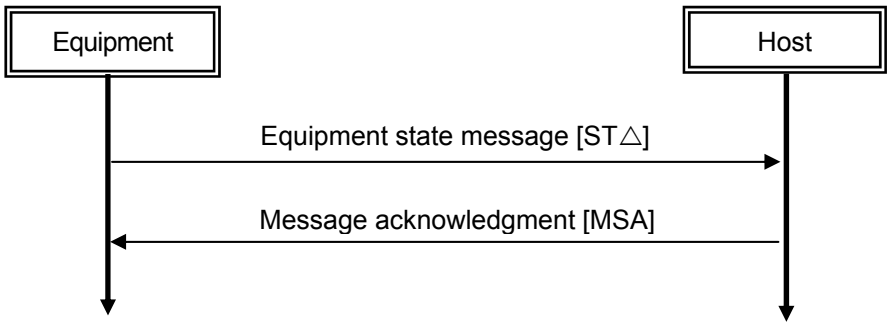

Fig. 8.5.1: Normal Sequence of Equipment State Transfer Function

(2) Communication Error Control

The equipment shall continuously transmit the equipment state message even after a communication error occurs, as long as the equipment state transfer function port (see Table 4.1.2: Functions and Corresponding Ports) is connected. To stop transmission, Select [Disabled] in [Online] - [Set Up] - [Other Transfer] - [Equipment State].

*Supplementary explanation

- Although the host returns an acknowledgment code [AA] (retry factor) in message acknowledgment in reply to the equipment state message, the equipment shall acquire and transmit the latest equipment state instead of transmitting the same message as that before a retry is performed. In this case, note that the message control ID of the message header record is incremented.

- Although the host does not transmit message acknowledgment and the equipment in the message acknowledgment state causes a timeout, the equipment state message shall be continuously transmitted. However, in the wait state due to timeout, the equipment shall not transmit the latest equipment state even after the equipment state changes.
  The equipment shall transmit the latest equipment state after a timeout occurs or message acknowledgment is received. Make sure the host returns message acknowledgment to allow the equipment to reflect the latest equipment state to the host.

9. Operation Model

The equipment provides several methods for enabling normal/repeat. Parameters or messages to be set vary according to operation in which the facility that installs the equipment described in this specification desires to enable normal/repeat. This section supports the installation by providing several examples of operations. In this specification, it is recommended to use the sample ID, thus, it is assumed to use the sample ID. Table 9.1 shows normal/repeat to be enabled and recommended setting parameters.

To operate the equipment in combination with several repeat types, contact the Beckman Coulter Technical Support.

Table 9.1: Normal/Repeat Type

Normal type	Setting parameters	Repeat type	Recommended setting parameters
Realtime test requisition query (See Section 8.1.)	[Online] Test Requisition Information Receive (Normal) = Realtime	Repeat	[Online] Test Requisition Information Receive (Repeat) = Realtime [System Maintenance] Sample ID (Realtime Processing) = Pattern 1
		Multiple entries of the same sample as another normal sample	[Online] Test Requisition Information Receive (Repeat) = None [System Maintenance] Sample ID (Realtime Processing) = Pattern 2
		Add On	[Online] Test Requisition Information Receive (Repeat) = None [System Maintenance] Sample ID (Realtime Processing) = Pattern 1 or 3
		Auto repeat (See Section 5.1.)	[Online] Test Requisition Information Receive (Repeat) = Realtime [System Maintenance] Sample ID (Realtime Processing) = Patterns 1 to 3
Sample information entry according to host direction (See Section 8.4.)	[Online] Test Requisition Information Receive (Normal) = Host Direction	Repeat	[Online] Test Requisition Information Receive (Repeat) = Host Direction [System Maintenance] Sample ID (Host Direction Processing) = Pattern 1
		Multiple entries of the same sample as another normal sample	[Online] Test Requisition Information Receive (Repeat) = None [System Maintenance] Sample ID (Host Direction Processing) = Pattern 2
		Add On	[Online] Test Requisition Information Receive (Repeat) = None [System Maintenance] Sample ID (Host Direction Processing) = Pattern 2
		Auto repeat (See Section 8.1.)	[Online] Test Requisition Information Receive (Repeat) = Realtime [System Maintenance] Sample ID (Host Direction Processing) = Pattern 1.2

Table 9.2: Description of Repeat Type

Repeat type	Description
Repeat	The normal sample is measured by loading it on the white rack (for routine sample), on the red rack (for emergency sample) and on the STAT table. Repeat is a method for measuring the sample by reloading it from the white/red rack onto the orange rack (for repeat sample), or loading it on the STAT table as a repeat sample.
Multiple entries of the same sample as another normal sample	It is a method for measuring a normal sample, reentering the same sample ID for the normal sample and using the sample ID entered twice for the normal sample for the repeat test. The sample does not need to be loaded on another rack.
Add On	It is a method for re-measuring a normal sample, selecting a test of the same sample No. in [Add On] on the equipment requisition menu and re-measuring the sample. The sample does not need to be loaded on another rack. The equipment does not inquire of the host or receive the test requisition information message.
Auto repeat	(See Section 8.1.)

* Supplementary explanation 1

To enter sample information, the equipment can select whether or not allow the same sample ID to be entered for the normal sample. When the same sample ID can be entered, the sample ID entered twice for the normal sample can be used for the repeat test. In contrast, when the same sample ID cannot be entered, the sample ID cannot be entered more than once but can be used to measure the sample as a repeat sample.
The operation method for repeat varies according to the setting as above. [Sample ID (Realtime Processing)] and [Sample ID (Host Direction Processing)] provided as relevant parameters determine whether or not to enter the same sample ID according to the set value, or whether or not to inquire of the host about sample information when the sample ID for the sample loaded on the equipment is read.)

* Supplementary explanation 2

When the same sample ID can be entered and the sample No. is not used for the normal sample, repeat cannot be enabled because the equipment cannot identify the original sample for the repeat sample (auto repeat is enabled). The setting that enables the same sample ID to be entered is as follows:

- Sample ID (Realtime Processing) = Pattern 2 or 3

Appendix

A.1 List of Data Flags

Priority	Data flag	Meaning	Remarks
1	d_	Excluded from QC by user.	
2	e_	Data edited by user.	
3	(_	Shortage of detergent for contamination parameters.	
4	Wa	Result has been analyzed with an erroneous cuvette.	
5	R_	Insufficient reagent.	
6	#_	Insufficient sample.	*1
7	%_	Clot detected.	*1
8	?_	Unable to calculate a result.	
9	n_	LIH test not performed.	
10	l[Level]	Result may be affected by lipemia.	
11	i[Level]	Result may be affected by icterus.	
12	h[Level]	Result may be affected by hemolysis.	
13	Y_	Reagent blank OD at last photometric point high.	
14	U_	Reagent blank OD at last photometric point low.	
15	y_	Reagent blank/routine OD at first photometric point high.	
16	u_	Reagent blank/routine OD at first photometric point low.	
17	@_	OD is higher than 3.0.	
18	$_	Not enough data to determine linearity of reaction.	
19	D_	OD of reaction is higher than maximum OD range.	
20	B_	OD of reaction is lower than minimum OD range.	
21	*_	Linearity error in rate method.	
22	&_	Prozone test data is abnormal.	
23	Z_	Prozone error.	
24	E_	Overreaction in a rate assay detected.	
25	Fx	Result (OD) is higher than the dynamic range.	
26	Gx	Result (OD) is lower than the dynamic range.	
27	!_	Unable to calculate concentration.	
28	)_	Reagent lot no. used at sample analysis is different from that used at calibration analysis.	
29	a_	Reagent expired.	
30	ba	Calibration expired.	
31	bh	No valid calibration used.	
32	bn	Mastercurve used.	
33	bz	Calibration curve for Prozone data used.	
34	F_	Result is higher than the dynamic range.	
35	G_	Result is lower than the dynamic range.	
36	Tx	Result of T-Hb or/and HbA1c is higher than the dynamic range.	
37	ph	Result is higher than the upper panic value.	
38	pl	Result is lower than the low panic value.	
39	T_	Abnormality found in inter-chemistry check.	
40	P_	Positive.	
41	N_	Negative.	
42	H_	Result is higher than reference range.	
43	L_	Result is lower than reference range.	
44	J_	Result is higher than the repeat decision range.	
45	K_	Result is lower than the repeat decision range.	
46	fh	Result is higher than the repeat run reflex range.	
47	fl	Result is lower than the repeat run reflex range.	
48	Va	The result of multiple measurement alienation check is NG.	

Priority	Data flag	Meaning	Remarks
49	8Q	QC deviation error	
50	xQ	Failure of one control used in a multi rule QC.	
51	1Q	QC data exceeds the range entered in the Single Check Level field.	
52	2Q	QC data exceeds 13S control range.	
53	3Q	QC data exceeds 22S control range.	
54	4Q	QC data exceeds R4S control range.	
55	5Q	QC data exceeds 41S control range.	
56	6Q	A preset number of consecutive QC results fall on one side of the mean.	
57	7Q	Consecutive QC results show steadily increasing or decreasing values.	
58	S_	Sample repeated and original results replaced by repeat result.	
59	/_	Test pending or not analyzed.	
60	r_	Data transmitted to host.	
61	c_	Data corrected by user.	

*1: The equipment does not perform auto repeat for the sample contained in the normal sample data message, which includes a result with any of the above data flags. (Auto repeat is disabled as a means of saving the reagent because of concerns about sample error.)
However, the equipment transmits a test requisition query message of auto repeat to the host in order to enter repeat information. Therefore, be careful to return the message.

A.2 Online Condition Parameters

Set Up	Contents	Menu
Test Requisition Information Receive		Online
Routine Normal	Realtime / Host Direction / None	
Routine Repeat	Realtime / Host Direction / None	
Emergency Normal	Realtime / Host Direction / None	
Emergency Repeat	Realtime / Host Direction / None	
Result Transfer		Online
Routine Normal	Realtime / Batch / None	
Routine Repeat	Realtime / Batch / None	
Emergency Normal	Realtime / Batch / None	
Emergency Repeat	Realtime / Batch / None	
Reagent Blank	Realtime / Batch / None	
Calibration	Realtime / Batch / None	
QC	Realtime / Batch / None	
Quick	Realtime / None	
Other Transfer		
Equipment State	Enabled / None	

Upper Protocol	Contents	Menu
T.R.I Receive Error Control	Continue / Stop	Online
Results Transfer Error Control	Continue / Stop	

Lower Protocol	Contents	Menu
Communication Control		Online
Retry	0 to 3	
Basic Data Format		
Start Code 1	None / 01H to 1FH	
Start Code 2	None / 01H to 1FH	
End Code 1	None / 01H to 1FH	
End Code 2	None / 01H to 1FH	
Use Yes/No		
Device ID	Yes / No, digits (32 digits)	
Host ID	Yes / No, digits (32 digits)	
Timer		
T1	1 to 99 (unit: 0.1 sec)	
T2	1 to 99 (unit: 0.1 sec)	
T3	1 to 99 (unit: 0.1 sec)	
T4	1 to 99 (unit: 0.1 sec)	

Format Configuration	Contents	Menu
Use Yes/No		
Sex	Yes / No	Requisition Format
Age	Yes / No	
Patient Information 1	Yes / No, digits (1 to 20 digits)	
Patient Information 2	Yes / No, digits (1 to 20 digits)	
Patient Information 3	Yes / No, digits (1 to 20 digits)	
Patient Information 4	Yes / No, digits (1 to 20 digits)	
Patient Information 5	Yes / No, digits (1 to 20 digits)	
Patient Information 6	Yes / No, digits (1 to 20 digits)	
Sample ID Digits	Yes / No, digits (4 to 26 digits)	
Sample No.	Yes / No	Online
Dilution Inf.	Yes / No *1	

*1: Dilution Inf. (Yes / No) is enabled only for the test requisition information message of normal sample (Routine/Emergency).

System Maintenance	Contents	Menu
Digits of Rack ID	4 digits / 5 digits	System Maintenance
OD Output	Yes / No	
Sample Kind Mix.	Yes / No	
Host LAN Option	Yes / No	
Connection		
IP Address	15 digits	
Port Number(×4)	4 digits	
Digit number check of Sample ID	Yes / No	
Not Analysis Data Search Process2	Pattern 1/2	
Sample ID (RealTime Processing)	Pattern 1/2/3	
Sample ID (Host Direction Processing)	Pattern 1/2	
Processed Sample Host Inquiry	Pattern 1/2	
Sample ID Read Error	Pattern 1/2	

A.3 Equipment Online Condition Parameter Sheet

Set Up	Contents		
Test Requisition Information Receive			
Routine Normal	Realtime	Host Direction	No
Routine Repeat	Realtime	Host Direction	No
Emergency Normal	Realtime	Host Direction	No
Emergency Repeat	Realtime	Host Direction	No
Result Transfer			
Routine Normal	Realtime	Batch	None
Routine Repeat	Realtime	Batch	None
Emergency Normal	Realtime	Batch	None
Emergency Repeat	Realtime	Batch	None
Reagent Blank	Realtime	Batch	None
Calibration	Realtime	Batch	None
QC	Realtime	Batch	None
Quick	Realtime	None	
Other Transfer			
Equipment State	Enabled	None	

Upper Protocol	Contents	
T.R.I Receive Error Control	Continue	Stop
Results Transfer Error Control	Continue	Stop

Lower Protocol	Contents		
Communication Control			
Retry	[ ] 0 to 3		
Basic Data Format			
Start Code 1	[ ] None / 01H to 1FH		
Start Code 2	[ ] None / 01H to 1FH		
End Code 1	[ ] None / 01H to 1FH		
End Code 2	[ ] None / 01H to 1FH		
Use Yes/No			
Device ID	Yes [ ] digits (32 digits)	No	
Host ID	Yes [ ] digits (32 digits)	No	
Timeout			
T1	[ ] 1 to 99 (unit: 0.1 sec)		
T2	[ ] 1 to 99 (unit: 0.1 sec)		
T3	[ ] 1 to 99 (unit: 0.1 sec)		
T4	[ ] 1 to 99 (unit: 0.1 sec)		

Format Configuration	Contents
Use Yes/No	
Sex	Yes No
Age	Yes No
Patient Information 1	Yes [ ] digits (1 to 20 digits) No
Patient Information 2	Yes [ ] digits (1 to 20 digits) No
Patient Information 3	Yes [ ] digits (1 to 20 digits) No
Patient Information 4	Yes [ ] digits (1 to 20 digits) No
Patient Information 5	Yes [ ] digits (1 to 20 digits) No
Patient Information 6	Yes [ ] digits (1 to 20 digits) No
Sample ID Digits	Yes [ ] digits (4 to 26 digits) No
Sample No.	Yes No
Dilution Inf.	Yes No

[System Maintenance]	Contents
Digits of Rack ID	4 digits 5 digits
OD Output	Yes No
Sample Kind Mix.	Yes No
Host LAN Option	Yes No
Connection	
IP Address	[ ] digits (15 digits)
Port Number(×4)	[ ] digits (4 digits)
Digit number check of Sample ID	Yes No
Not Analysis Data Search Process2	Pattern 1 Pattern 2
Sample ID (RealTime Processing)	Pattern 1 Pattern 2 Pattern 3
Sample ID (Host Direction Processing)	Pattern 1 Pattern 2
Processed Sample Host Inquiry	Pattern 1 Pattern 2
Sample ID Read Error	Pattern 1 Pattern 2

A.4 Alarm List

(1) Alarm No. 6100: Online Connection Error (aa)(bbbbbbbbbbbbbbb c dddd)

[Processing on the equipment when this alarm is raised]

A. When [Stop] is selected in T.R.I Receive Error Control on the [Online] screen
- The equipment shall stop subsequent test requisition information receive processing.
- When the next measure start is performed after realtime test requisition information receive processing, the equipment shall clear the stopped test requisition information receive state and perform realtime test requisition information receive processing again.

B. When [Continue] is selected in T.R.I Receive Error Control on the [Online] screen
- When the connection is successfully made again, the equipment shall continuously perform subsequent test requisition information receive processing.
- When the error type is [62], the equipment shall perform the same processing as when [Stop] is selected in [T.R.I Receive Error Control].

[Details of the alarm]

A. A communication error occurred during online message transmission/reception.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Error type	50	Connection failure
		51	Abnormal connection
		52	Wait failure
bbb	IP address		
c	Port type	0	Realtime input/output
		1	Batch output
		2	Host direction
		3	Other 1
dddd	Port No.		

(2) Alarm No. 6101: Online Error (aa)(bbb cc dddd) eeeee

[Processing on the equipment when this alarm is raised]

A. When [Stop] is selected in T.R.I Receive Error Control on the [Online] screen
- The equipment shall stop subsequent test requisition information receive processing.
- When the next measure start is performed after realtime test requisition information receive processing, the equipment shall clear the stopped test requisition information receive state and perform realtime test requisition information receive processing again.

B. When [Continue] is selected in T.R.I Receive Error Control on the [Online] screen
- The equipment shall continuously perform subsequent test requisition information receive processing.
- When the error type is [62], the equipment shall perform the same processing as when [Stop] is selected in [T.R.I Receive Error Control].

[Details of the alarm]

A. A communication error occurred during online message transmission/reception.

B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Error code	53	Transmission failure
		54	Reception failure
		55	Query timeout (Excess retries)
		60	Abnormal sequence
		61	Abnormal upper equipment data format (Acknowledgment code [AE])
		62	Abnormal lower equipment data format (Acknowledgment code [AE])
		63	Upper equipment retry cause (Acknowledgment code [AR])
		64	Lower equipment retry cause (Acknowledgment code [AR])
		65	Upper equipment test requisition information receive disabled (Acknowledgment code [CE])
		66	Lower equipment test requisition information receive disabled (Acknowledgment code [CE])
bbb	Message type	R△△	Related to test requisition query
		S△△	Related to test requisition information
		D△△	Related to result
		ST	Equipment state
		MSA	Message acknowledgment
cc	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
dddd	Sample No. or sample ID		
eeeee	Message control ID		

(3)Alarm No. 6102: Online Format Error (aa bb)(ccc) ddddd

[Processing on the equipment when this alarm is raised]

A. The equipment shall discard the message received online.
B. The equipment shall stop subsequent test requisition information receive processing.

[Details of the alarm]

A. The equipment failed to convert the message received online into readable information due to its format error.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Conversion error type		See C.
bb	Conversion sub error code	0	Normal
		1	Null denied and absent data error
		2	Unused and data present data error
		3	Data character count error
		4	Error inconsistent with specified data
		5	Error with absent data
		6	Error with non-numeric data for numeric data fields
		7	Unauthorized use of delimiters
ccc	Message type	R△△	Related to test requisition query
		S△△	Related to test requisition information
		D△△	Related to result
		ST△	Equipment state
		MSA	Message acknowledgment
ddddd	Message control ID		

C. The conversion error types are as follows:

0	Normal
6	STX error
7	ETX error
H Record	
100	Record type ID error
101	Delimiter definition error
102	Message control ID error
103	Equipment No. error
104	Host recognition ID error
105	Message type code error
106	Date and time of message error
107	<CR> error during reception
Q Record	
200	Record type ID error
201	Sequence number error
202	Dummy 1 error
203	Sample ID error for test requisition query start number
204	Sample No. error for test requisition query start number
205	Dummy 3 error
206	Dummy 4 error
207	Dummy 5 error
208	Test information query end number error
209	Request information status code error
210	Measure type error
211	Sample kind error
212	Sample No. error
213	Original sample kind error
214	Original sample No. error
215	Sample ID error
216	Rack No. error
217	Cup position error
218	Sample type error
219	<CR> error during reception
P Record	
300	Record type ID error
301	Sequence number error
302	Sample ID error
303	Patient ID (PID) error
304	Patient information 1 error
305	Patient information 2 error
306	Years error
307	Months error
308	Birthdate error
309	Patient sex error
310	Patient information 3 error
311	Patient information 4 error
312	Patient information 5 error
313	Patient information 6 error
314	<CR> error during reception

O Record	
400	Record type ID error
401	Sequence number error
402	Specimen ID (collected) error
403	Sample ID error for specimen ID
404	Sample ID error for instrument specimen ID
405	Sample No. error for instrument specimen ID
406	Measure type error
407	Sample kind error
408	Sample No. error
409	Original sample kind error
410	Original sample No. error
411	Sample ID error
412	Rack No. error
413	Cup position error
414	Sample type error
415	Test item No. error
416	Dilution Inf. error
417	<CR> error during reception
R Record	
500	Record type ID error
501	Sequence number error
502	Test item error
503	Result error
504	Result type error
505	RB result type error
506	Data flag error
507	Quick recognition flag error
508	Measure type error
509	Sample kind error
510	Sample No. error
511	Original sample kind error
512	Original sample No. error
513	Sample ID error
514	Rack No. error
515	Cup position error
516	Sample type error
517	CAL/Control/RB number error
518	Lot/bottle No. error
519	<CR> error during reception
L Record	
600	Record type ID error
601	Sequence number error
602	End code error
603	Acknowledgment code error
604	Error message error
605	<CR> error during reception
S Record	
700	Record type ID error
701	Sequence number error
702	Event date/time error
703	Equipment state error
704	Equipment state string error
705	Mode error
706	Mode string error
707	Alert level error
708	<CR> error during reception

(4) Alarm No. 6103: Online Set Up Error (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A. The equipment shall discard the message received according to host direction.
B. The equipment shall continue test requisition information receive processing according to host direction.

[Details of the alarm]

A. The sample kind contained in the test requisition information message received online was not to be received according to host direction in [Online].
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(5) Alarm No. 6104: Online Requisition Information Receive Error (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A. The equipment shall discard the message received according to host direction.
B. The equipment shall continue test requisition information receive processing according to host direction.

[Details of the alarm]

A. When receiving the test requisition information message online, the equipment was not ready to receive the message. *1
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

*1: In the following cases, the equipment cannot receive the test requisition information message because this alarm is raised:
- The operation mode is END.
- The equipment state is [CL].
- The equipment state is [IN] and the operation mode is INITIAL or RESET. (In this case, the mode ID is [CNRS].)

- The acknowledgment code [AR] in message acknowledgment is returned to the test requisition information message and the retry count is exceeded.

* The acknowledgment code [CE] sample entry disabled is returned in message acknowledgment when the retry count is exceeded.
The acknowledgment code [AR] is returned when a database error occurs and the equipment state is [CO].

(6) Alarm No. 6111: Online Illegal Analysis Method (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A.The measure type contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Received measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(7) Alarm No. 6112: Online Illegal Sample Kind (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample kind contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Received sample kind/sample type	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(8) Alarm No. 6113: Online Illegal Sample Type (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A.The sample type contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/received sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(9) Alarm No. 6114: Online Illegal Sample No. (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample No. contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Received sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(10) Alarm No. 6115: Online Illegal Rack No. (aa bbbb:cccc-dd) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The rack No. contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccc	Received rack No.		
dd	Position in the received rack		
eeeeee	Sample ID		
fffff	Message control ID		

(11) Alarm No. 6116: Online Illegal Sex Text (aa bbbb:c) dddddd, eeeee

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The patient sex contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
c	Received patient sex		
dddd	Sample ID		
eeeee	Message control ID		

(12) Alarm No. 6117: Online Illegal Age/Month (aa bbbb:ccc dd) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The years or months contained in the received test requisition information message were not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
ccc	Received years		
dd	Received months		
eeeeee	Sample ID		
fffff	Message control ID		

(13) Alarm No. 6118: Online Illegal Patient Information (aa bbbb:cccccc d) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. Patient information contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Received patient information		
dd	Patient information No. not within the specified range		
eeeeee	Sample ID		
fffff	Message control ID		

(14) Alarm No. 6119: Online Illegal Sample ID (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample ID contained in the received test requisition information message was not within the specified range.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Received sample ID		
dddddd	Message control ID		

(15) Alarm No. 6120: Online Sample ID Mixed (aaaaaa bbbbbb) ccccc

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. Multiple sample IDs mixed in the received Item Selection Information Message.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details
aaaaaa	Received sample ID	
bbbbbb	Received sample ID	
ccccc	Message control ID	

(16) Alarm No. 6131: Online Analysis Method Mismatch (aa bbbb<>cc dddd) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The measure type contained in the received test requisition information message was not consistent with the requested data.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Transmitted measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Transmitted sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cc	Received measure type/sample type	See Transmitted measure type/sample type.	
dddd	Received d sample No.	See Transmitted sample No.	
eeeeee	sample ID		
fffff	Message control ID		

(17) Alarm No. 6132: Online Sample Kind Mismatch (aa bbbb<>cc dddd) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A. The sample kind contained in the received test requisition information message was not consistent with the requested data.
B. The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample ID contained in the received test requisition information message was not within the specified range.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Transmitted measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Transmitted sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cc	Received measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
dddd	Received sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
eeeeee	Sample ID		
fffff	Message control ID		

(18) Alarm No. 6133: Online Sample Type Mismatch (aa bbbb<>cc dddd) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A. The sample kind contained in the received test requisition information message was not consistent with the requested data.
B. The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample type contained in the received test requisition information message was not consistent with the requested data.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Transmitted measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Transmitted sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cc	Received measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
dddd	Received sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
eeeeee	Sample ID		
fffff	Message control ID		

(19) Alarm No. 6134: Online Sample No. Mismatch (aa bbbb<>cc dddd) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A. The sample kind contained in the received test requisition information message was not consistent with the requested data.
B. The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample No. contained in the received test requisition information message was not consistent with the requested data.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Transmitted measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Transmitted sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cc	Received measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
dddd	Received sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
eeeeee	Sample ID		
fffff	Message control ID		

(20) Alarm No. 6135: Online Rack No. Mismatch (aa bbbb:cccc-dd<>eeee-ff) gggggg, hhhhh

[Processing on the equipment when this alarm is raised]

A. The sample kind contained in the received test requisition information message was not consistent with the requested data.
B. The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The rack No. or cup position contained in the received test requisition information message was not consistent with the requested data.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Transmitted measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Transmitted sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccc	Transmitted rack No.		
dd	Position in the received rack		
eeee	Transmitted rack No.		
ff	Position in the received rack		
gggggg	Sample ID		
hhhhh	Message control ID		

(21) Alarm No. 6136: Online Mismatch (aaaaaa<>bbbbbb) ccccc

[Processing on the equipment when this alarm is raised]

A. The sample kind contained in the received test requisition information message was not consistent with the requested data.
B. The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample ID contained in the received test requisition information message was not consistent with the requested data.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details
aaaaaa	Transmitted sample ID	
bbbbbb	Received sample ID	
ccccc	Message control ID	

(22) Alarm No. 6151: Online Test Item Error (aa bbbb:ccc d) eeeeee, fffff

[Processing on the equipment when this alarm is raised]

A.The equipment shall discard the test requisition information message received online.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. An error was detected in the settings in online test No. and dilution inf. contained in the received test requisition information message.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
ccc	Received online test No.		
d	Received dilution inf.		
eeeeee	Sample ID		
fffff	Message control ID		

(23) Alarm No. 6152: Online Repeat Item Error (aa bbbb) ccccc

[Processing on the equipment when this alarm is raised]

A.The sample kind contained in the received test requisition information message was not consistent with the requested data.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. When the test requisition information message of repeat sample was received, a repeat item failed to be entered for one of the following reasons:

A)The original sample specified in the message has not been entered in normal sample information.
B)When the sample is enabled, the sample No. has not been set in the original sample specified in the message.
C)The original sample specified in the message has been entered as another repeat sample.
D)When the parameter setup enables sample type mixing, the sample specified in the message is different from the sample type of the original sample.

B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
ccccc	Message control ID		

(24) Alarm No. 6153: Online Same Sample ID Error (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A.The sample kind contained in the received test requisition information message was not consistent with the requested data.
B.The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. The sample ID contained in the received test requisition information message was already registered as RB, ACAL, or QC sample ID.
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(25) Alarm No. 6161: Online Maximum Sample No. Error (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A. The sample kind contained in the received test requisition information message was not consistent with the requested data.
B. The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. When the test requisition information message was received, the new maximum value failed to be entered for the sample No.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(26) Alarm No. 6162: Online Samples Remaining Error (aa bbbb) cccccc, ddddd

[Processing on the equipment when this alarm is raised]

A. The equipment shall discard the message received according to host direction.
B. The equipment shall continue online test requisition information receive processing.

[Details of the alarm]

A. When the test requisition information message was received, zero (0) failed to be entered for the number of samples remaining.
B. The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

(27) Alarm No. 6181: Online Pending Transfers (aaaaaaaaaaaaaaa,bb cccc)

[Details of the alarm]

A. When the batch online result was transferred, some samples failed to be transferred. *1
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aaaaa	Index name		
bb	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
cccc	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample

*1: Up to 5 samples that failed to be transferred shall be displayed for each alarm.

(28) Alarm No. 6182: Sample Registration Was Done For Host Direction (aa bbbb) cccccc, ddddd

[Details of the alarm]

A.The test requisition message was received according to host direction, sample information was entered. *1
B.The code contents in brackets and their meanings are as shown below:

Code	Classification	Details	
aa	Measure type/sample type	△△	Serum Normal sample
		△U	Urine Normal sample
		△X	Other 1 Normal sample
		△Y	Other 2 Normal sample
		△W	Whole blood Normal sample
		H△	Serum Repeat sample
		HU	Urine Repeat sample
		HX	Other 1 Repeat sample
		HY	Other 2 Repeat sample
		HW	Whole blood Repeat sample
bbbb	Sample No.	0001 - 9999	Routine sample
		E001 - E999	Emergency sample
cccccc	Sample ID		
ddddd	Message control ID		

*1: When receiving the test requisition information message according to host direction and overwriting the sample No. with the message while editing sample information about the sample No. on the [Rack Requisition] screen, the equipment shall overwrite the sample No. based on the test requisition information message and shift to the screen for the next sample No. This is a notification alarm in that case.

(29) Alarm No. 6183: There Is Unprocessed Sample At Current Index

[Details of the alarm]

A. sample that has not been measured is included in the current index. *1

*1: When the sample information entry function according to host direction is used, the sample that has been previously entered but not been measured shall not be measured after the index is replaced, because the index becomes old. Therefore, a reminder alarm shall be raised when the index is replaced.
To measure the sample after replacing the index, re-transmit the test requisition information message about the sample to be measured.
When the index is replaced, the [CL] equipment state shall be transmitted to the host.

AU5800 Online LAN Specification Revision History Table

Version flag A: Analyzer, B: Parts, S: Program, V: Document version number

DATE	DESCRIPTION	PAGE	CHANGE METHOD	VERSION	CONFIRM
7. Oct, 2011	New publication	All page		1st Edition	