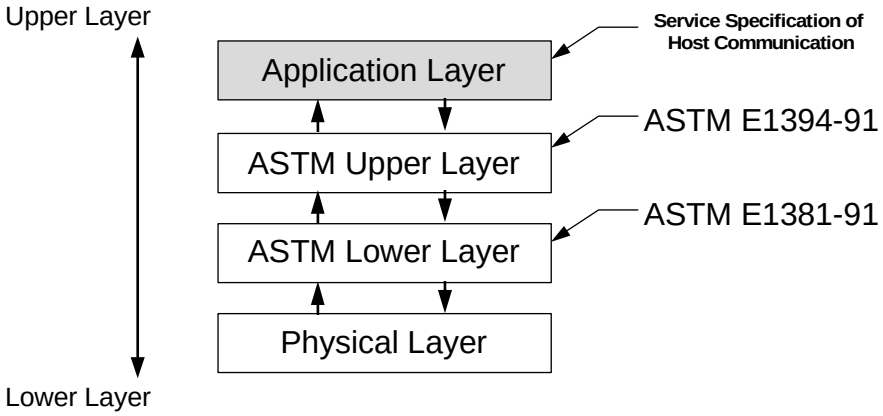
7.2.1 OVERVIEW

(1) Forward

The communication process between the 7600 and the HOST is divided into three layers as shown below. This specification will explain the processing methods for the application layer.

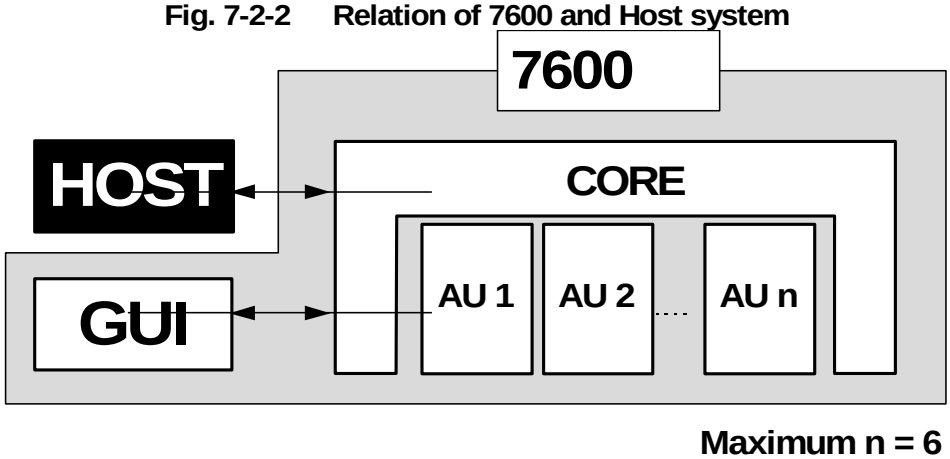
Fig. 7-2-1. HOST Communication Processing Layers



(2) Architecture of the Device and Positioning of the HOST

The 7600 consists of 3 types of devices; a GUI (Graphical User Interface) that displays and edits the results of analysis or performs settings for the analytical parameters, several AUs (Analytical Unit: n ≤) measure samples using reagent and a CORE that controls the AUs by combining each of the AUs together. (Refer to Fig. 7-2-2) Primarily, transfers of the Test Selection Information or analytical data for patient samples will be performed by this Unit by connecting the HOST to the CORE through RS232.

Fig. 7-2-2 Relation of 7600 and Host system



(3) How to Operate the Device

(a) Types of Samples

Samples that are handled by the 7600 are separated into standard samples for the working curve parameters (for calibrations), control samples for the quality control and patient samples. Patient samples are analyzed by placing them in three separate racks; a routine rack for routine analysis, STAT rack that interrupts between routine analysis and Rerun rack for reanalysis (rerun). The patient samples that are placed in the separate racks are called routine samples, STAT samples and Rerun samples.
During analysis, the device will read the rack number that holds the samples, identify the type of samples according to the range of the rack number read, then analyzes according to their criteria. It is possible to place a maximum of 5 samples in one rack. Types of samples, racks and their relationships with the rack numbers that are handled by this Unit are shown in Table 7-2-1.

Table 7-2-1 Types of Samples and Rack Numbers

Run Type of Samples	Type of Racks	Rack Numbers	Purpose	Automatic Rerun
Routine sample	Routine rack	5001 ~ 8999	For routine analysis of patient samples	¡
STAT sample	STAT rack	4001 ~ 4999	For an emergency analysis	¡
Rerun sample	Rerun rack	A001 ~ A999	For reanalysis of routine samples	¡
Control sample	Control rack	3001 ~ 3999	For quality control	X
Standard sample	Standard rack	2001 ~ 2999	For working curve (for calibration)	X
Cleaning agent	Cleaning rack	B999	For cleaning sample probes (no analysis)	X

¡ :Enable, X Disable

Excluding the cleaning agent and standard samples, samples are classified into 4 types, “blood serum / plasma,” “urine,” “CSF” and “Suprnt” and “other” is added as a reserve; that makes it a total of 5 types of samples (Sample Type). GUI in the device makes it possible for a specialized analysis criteria setting for each of the types.
Wash Rack is not supported in HOST Communication.

(b) Sample Number Mode and ID Mode

Method of Patient Sample Analysis will vary according to whether Barcode Reader Accessory offered as an option for 7600 is installed or not. Its characteristics are mentioned below.

Sample Number Mode

For Routine Samples, if Barcode Reader Accessory is NOT installed, numbers for the samples are collected in the order from the sample number of the first analysis that is set in the GUI for each type, and patient information (test selection information, analysis data) is managed using that sample number, sample types and run type of samples. Sample numbers are one of the important key information for registrations and deletions of the patient database in the 7600.
As for STAT sample; rack numbers, position numbers, sample type and sample Number is the key information to access the patient database.

ID Mode

If the Barcode Reader Accessory is installed, the Unit will automatically read the patient ID (barcode) attached to the sample and manages the patient information using the ID read and the sample type as well as the Sample Type as the key. The difference from the Sample Number Mode is that the characteristic of this mode is to perform an analysis without being consciences of the order. The ID mode is applicable for both routine samples and STAT samples.

As for the HOST connection; the method of operation for this Unit, as explained above, must be followed by the HOST side also. Therefore, sample type, rack type, rack number, position number, sample number mode, ID mode and sample numbers become important key information in order to access the patient database in the 7600.
In 7600 System, the mode which means sample number and ID can be switched at the status of Stand-by. When the mode is changed, the mode of HOST must correspond to that of 7600.
In the following Chapter 7.2.2, Realtime Communications for transfer of information necessary for analysis simultaneously with the operation of the Unit while the Unit is in operation will be explained. Chapter 7.2.3 will explain Batch Communications that transfers patient information following the instructions from GUI or HOST (customer) when the Unit is not in operation.

7.2.2 REALTIME COMMUNICATION

The relationships between Realtime Communication functions and sample types are shown in Table 7-2-2. The following are the details regarding communication procedures and communication functions.

Table 7-2-2 Realtime Communication Functions

Communication Functions	Patient Samples			Control Sample	Standard Sample
	Routine	STAT	Rerun		
Test selection inquiry	¡	¡	¡	X	X
Analytical data transmission	¡	¡	¡	¡	¡
Automatic Rerun test selection information reception	¡	¡	(notes 1)	X	X
Automatic Rerun test selection inquiry	¡	¡	(notes 2)	X	X
Automatic Rerun analysis data transmission	¡	¡	(notes 3)	X	X

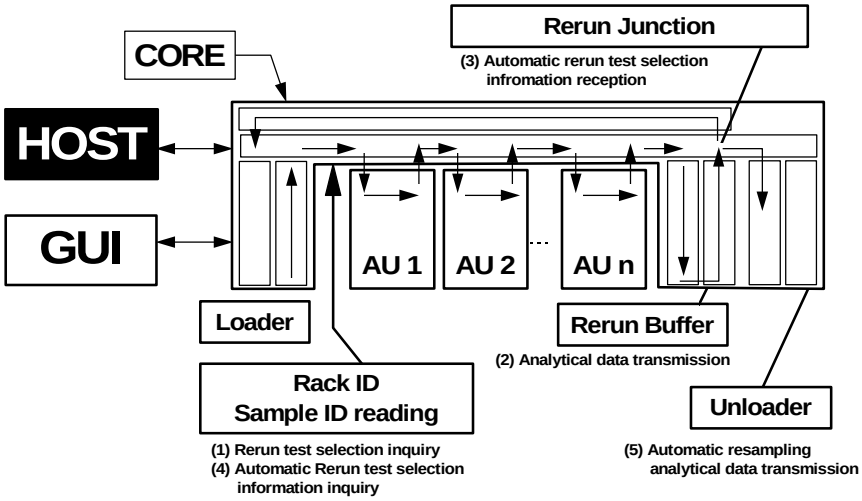
(¡ : will be performed, X: will not be performed)

(notes 1) Rack Passing mode : It will be performed when the result of first run is available or there is no result can be uploaded to HOST. It will be registered as a batch when it's ignored.
Non-Rack passing mode : Ignored. It will be registered as a batch.
(notes 2) Rack Passing mode : It will be performed when the result of first run is available or there is no result can be uploaded to HOST.
Non-Rack Passing mode : Ignored.
(notes 3) Rack Passing mode : It will be performed when result(s) is(are) available.
Non-Rack Passing mode : Blocked.

(1) Communication Procedures

Communication with a HOST is performed in the order (1) ~ (5) in Figure 1-3 following the analysis procedures of the Unit.

Figure 7-2-3 Analysis Flow and Communication Procedure



(i) Test Selection Information Inquiry

Multiple racks (a maximum of 5 samples) with samples will be fed continually from the rack Loader, after reading the rack ID and patient ID, using the information read as the key, an inquiry is made to the HOST for the test selection information ((1) in the Figure). An inquiry text message contains information of one sample. The CORE will determine the feeding route according to the test selection information received from the HOST and feeds the racks in order to each Analyzer.

GUI is able to set the Timeout (refer to Chapter 5) for the inquiry response time. If the HOST doesn't respond to the inquiry within the timeout interval, the inquiry message transmission will be regarded as failed and the instrument inquires for the next sample. When the set time is long, analysis process will be delayed during that time. However, if timeout is not set, it will wait indefinitely until the test selection information is completed by the HOST.

(ii) Analytical Data Transmission

At the Analyzer Unit, the analysis is performed based on the rack and the Test Selection Information received from the CORE. When the analysis is completed, the result of the analysis is reported to the CORE. The result of the analysis from each Analyzer is compiled at the CORE. As soon as result of the analysis for one sample is completed, the analytical data is transmitted to the HOST in order. During that time, the rack will be held in the Rerun Buffer.

Control results are transmitted to the HOST when a) all results in one Analyzer Unit are ready or b) all results of a test are ready. One of a) or b) can be selectable.

Calibrator results are transmitted to the HOST when all results of a test are ready

A result of routine/STAT/rerun/rerun STAT sample will not be uploaded to HOST if a data alarm which is defined for "Review by exception" is attached.

(iii) Automatic Rerun Test Selection Information Reception

The HOST can transmit an Automatic Rerun Selection Information for the analytical data of the samples transmitted from the Unit. This timeout period for the receptions is same as (i) response timeout and can be set at the GUI. Rack with samples unable to receive information

within a set time will become an error and it will be transferred to the Rerun line whether there is a Rerun Selection Information or not. If the set time is long, analytical process will be delayed for that length of time. If there is no timeout period set, the unit will wait indefinitely for a response from the HOST.

When "Non-Rack Passing" mode is selected in "System Setting", the instrument waits for automatic rerun selection information at the time of first run analysis and manual rerun. However, at the time of automatic rerun, the instrument does not wait for automatic rerun selection information in order to unload the rack.
When "Rack Passing " mode is selected in "System Setting" and there is a test of the first run measurement and rerun , the instrument waits for automatic rerun selection information. In other cases, the instrument does not wait for automatic rerun selection information in order to unload the rack.
The test selection information transmitted from HOST when the instrument does not wait for automatic rerun selection information is received as a batch .
HOST can transmit automatic rerun selection information about the sample to which the instrument transmitted measurement result data. This receiving timeout time as well as the response timeout time can be set up in the GUI. If there is at least one sample for which test selection information is not transmitted within the timeout interval it will be transferred to a rerun line irrespective of the existence of rerun selection information. If timeout interval is rather long, the following operation will be delayed in the meantime. The instrument waits for the response from HOST eternally if no timeout interval is defined.
Only the result of the first run and additional tests can be requested. Since distinction of the first run / rerun is attached for every test at the time of measurement result transmission, the first run / rerun is clearly distinguishable.

(iv) Automatic Rerun Test Selection Information Inquiry

The Rack re-fed from the Rerun line will make an inquiry for the analytical test for the Rerun using the same key as the initial inquiry to the HOST while passing through the Rack ID and Sample ID reader. This process is only applied for the sample which can not receive information within a set time by (iii) above. However, there will be no inquiry for the samples which the Automatic Rerun Selection Information has been received by (iii) above. Same as the initial analysis, the CORE will transport the rack by determining the loading route according to the analytical tests for Rerun received from the HOST. The timeout period for a response will be observed in the same manner as(1).

(v) Automatic Rerun Analytical Result Data Transmission

The rack which received the order for the rerun will perform an analysis in the same manner as the first time and it will report the results to the CORE when the analysis is completed. The CORE will compile Rerun data from all the Analyzers and transmit the Rerun analytical data to the HOST as soon as Rerun data is completed for one sample. Since automatic Rerun is not repeated, the racks that have finished with Rerun will be carried to the rack unloader without waiting for the output of the result.

(2) Test Selection Information Inquiry

(a) Inquiry Activity

The test selection inquiry is performed sample by sample. One sample is inquired at one time. Normally when there is an inquiry specified (refer to Chapter 5), an inquiry is performed whether there is a Test Selection Information in the patient database or not; however, if it is not specified, an inquiry is made only for the sample without the Test Selection Information.

(b) Reception Timeout Error Processing

An inquiry for the next sample will not be made until either all of the Test Selection Information inquired has been completed or reception timeout error occurs. Therefore, analysis will be delayed during that time. If a reception timeout occurs, shift to the inquiry for the next sample will be made after the cancellation request has been issued for the inquired sample.

Reception timeout period can be set at the GUI [Utility]-[System]-[HOST Communication]

(c) Inquiry Key Information

Information about the inquiry key is shown in Table 7-2-3. An error will occur if the key information in the Test Selection Information received is different from the one at the inquiry and the patient database will not be registered. In this case, if there is one other sample which corresponds to the key information, the test selection information will be registered in the patient database for the other sample.

Table 7-2-3 Test Selection Inquiry Key Information Table

Key Information	ASTM Field Definition Name	Content
Sample Identification	Priority	Routine or STAT identification
Identification Detail	Instrument Specimen ID	First time or Rerun identification
Sample Type	Sample Type	Blood serum / Plasma, urine, CSF, Suprnt, other type
Sample Number	Sample No	Valid when analysis order number, routine / STAT sample and barcode reader is not used.
ID Number	Sample ID	Barcode information when the barcode reader is used. Used as a patient comments when the barcode reader is not used.
Rack Number	Rack ID	Rack number read by the Unit. Ranges will be different for routine racks, STAT racks and Rerun racks.
Position Number	Position No	Position where samples are to be placed on the rack.

Details of matching rules are shown in following table 7-2-3-2 and 7-2-3-3.

Table 7-2-3-1 Details of Key information (From 7600 to HOST)

	Sample Number Mode					ID Mode				
	Routine			STAT		Routine			STAT	
	1 st	Auto Rerun	Manual Rerun	1 st	Auto Rerun	1 st	Auto Rerun	Manual Rerun	1 st	Auto Rerun
Sample No.	E	E	E	E	E	0 (Fixed)	0 (Fixed)	0 (Fixed)	0 (Fixed)	0 (Fixed)
ID	E	E	E	E	E	E	E	E	E	E
Rack No.	E	E	E	E	E	E	E	E	E	E
Position No.	E	E	E	E	E	E	E	E	E	E
Type	E	E	E	E	E	E	E	E	E	E
Sample Identification	E	E	E	E	E	E	E	E	E	E
~~Identification Detail~~	~~E~~	~~E~~	~~E~~	~~E~~	~~E~~	~~E~~	~~E~~	~~E~~	~~E~~	~~E~~

E: Enable: Sent from 7600 to HOST

Table 7-2-3-2 Details of Key information to be checked when downloaded from the HOST

	Sample Number Mode					ID Mode				
	Routine			STAT		Routine			STAT	
	1 st	Auto Rerun	Manual Rerun	1 st	Auto Rerun	1 st	Auto Rerun	Manual Rerun	1 st	Auto Rerun
Sample No.	C	C	N	C	C	N	N	N	N	N
ID	N	N	N	N	N	C	C	C	C	C
Rack No.	N	N	C	C	C	N	N	N	N	N
Position No.	N	N	C	C	C	N	N	N	N	N
Type	C	C	C	C	C	*1	C	*1	*1	C
Sample Identification	C	C	C	C	C	C	C	C	C	C
~~Identification Detail~~	~~C~~	~~C~~	~~C~~	~~C~~	~~C~~	~~C~~	~~C~~	~~C~~	~~C~~	~~C~~

C: checked by 7600
N: not checked by 7600
*1: If 7600 inquiries TS without type, it will not be checked by 7600.

Table 7-2-3-3 Details of Key information Check for ID read error mode (7600 Receiving)

In the mode of "Analysis of Erred Barcode Reading of the Samples During ID Mode" "TS inquiry in TS Ask in Barcode Read Error", use following key as the substitute for the table 7-2-3-2.

	ID Mode		
	Routine		STAT
	1 st	Auto Rerun	1 st
Sample No.	N	N	N
ID	N	N	N
Rack No.	C	C	C
Position No.	C	C	C
Type	*1	C	*1
Sample Identification	C	C	C
Identification Detail	C	C	C

C: checked by 7600
N: not checked by 7600
*1: If 7600 inquiries TS without type, it will not be checked by 7600.

(d) Test Selection Information Used for Analysis

An Alarm is registered if the response for an inquiry is not received within a set time, and analysis is performed according to the Test Selection Information registered previously in the 7600 or the Default Test Selection Information. Relationships between the requests from a HOST and the Test Selection Information in the 7600 are shown in Table 7-2-4.

Table 7-2-4 Relationships Between Request from a HOST and Test Selection Information in the 7600.

Run Type	TS from a HOST	TS in the 7600 Side		Analysis
		Patient TS	Default TS	
Routine Sample, STAT Sample	**¡**	**¡**	**¡**	HOST-TS and 7600-TS
	¡	**¡**	X	HOST-TS and 7600-TS
	¡	X	**¡**	HOST-TS
	¡	X	X	HOST-TS
	X	**¡**	**¡**	7600-TS
	X	**¡**	X	7600-TS
	X	X	**¡**	Default-TS
	X	X	X	No analysis
Rerun	**¡**	**¡**	-	HOST-TS and 7600-TS
	¡	X	-	HOST-TS
	X	**¡**	-	7600-TS
	X	X	-	No analysis

¡ : There are both a record and a request.
X : Either there is no record or there is a record but no request, -: Invalid)
TS : Test Selection Information
HOST-TS : requests from the HOST
7600-TS : registered TS in 7600
Default-TS : default TS generated in 7600

(e) Analysis Test Masking

The 7600 System has a function to stop the analysis of either the test or the analyzer if an abnormality should occur in reagent or in calibration results by supervising the analytical conditions of each analyzers. This is referred to as an Auto Masking. There is also a function to stop the analysis of the test activities or analyzer activities by an user through an instruction from the GUI. This is referred to as a Manual Masking. Analytical tests masked through these two masking functions will not perform analysis even if there is an analytical request from a HOST.

(f) Manual Rerun Method

To perform analysis of the patient sample that became an analytical error once again by placing it on the special Rerun rack (Rerun rack) is referred to as Manual Rerun Analysis and the sample that is placed on the Rerun rack again is referred to as a Rerun Sample. This function is valid only for routine samples. This is not performed on the STAT samples. Differences in the inquiries between the Sample Number Mode and ID Mode are explained below.

(i) Inquiry for Rerun Sample Test Selection Information in the Sample Number Mode

After the samples are repositioned on the Rerun Rack, the Rerun Rack's rack number and the position number is registered for the repositioned samples at the GUI. This is referred to as an 'assignment' on the Rerun Rack. Sample Type in the inquiry text and the sample numbers are valid for the samples that were assigned to the Rerun rack; however, they are not valid for those samples that were not assigned. Furthermore, a HOST must assign a Sample Type and sample numbers for the samples that were not assigned to the Rerun Rack.

Inquiry to HOST for unassigned samples in rerun rack

When the samples are not assigned in rerun rack, 7600 asks to HOST as sample number "0" and with rack ID (rack number and position) as key information. If Host has the table of the rerun rack ID and sample number, the host has to send the sample number which is defined in the table. If host can not find the sample in table, the host has to send the sample number "0". If 7600 receives the sample number "0", 7600 does not receive the message and generates the alarm [110-1 Reception Text Error]. The 7600 waits the time-out. When the Host can send the assigned sample No. as a real time response (not batch), 7600 can accept the test request.

(ii) Inquiry for Rerun Sample Test Selection Information for ID Mode

Whether they are first time or Rerun will be classified according to the rack numbers. Same as the first time analysis, using the barcode read as the key, inquiries for the Test Selection Information will be made to the HOST by matching the run type of the first time and Rerun samples. When the barcode and the sample type of the measured sample matches that of the samlple which is already analyzed , the sample is Rerun sample. When the sample is not analyzed, the sample is first sample.

(g) Analysis of Erred Barcode Reading of the Samples During ID Mode

The Unit supports 'Erred Barcode Reading of Samples Register Screen' to analyze patient samples with an erred barcode reading or when a barcode label is missing. For the rack position number with erred barcode reading, a barcode can be manually input with this screen. During an analysis, if barcode that was manually input is registered for the position with an erred reading, an inquiry of the Test Selection Information can be made to the HOST by using this barcode, rack position number and Sample Type; but inquiry nor analysis will be performed for those samples without a manual input.

TS Ask in Barcode Read Error

This option can be set in [Utility]-[System]-[HOST setting]
Following explanation is for "ON" of this option

Mode

ID mode only

Detail

*The sample which barcode is not read by system, 7600 send to the HOST the Rack ID, position as key information and sample ID as "**********" [13 characters of "*"] or [22 characters of "*"] of dummy ID. If the HOST has the table of the Rack ID, position and Sample ID, HOST can send back to the 7600 with the correct Sample ID instead of "**********" as the barcoded samples.*

(h) Analysis of the Samples of No Sample Type During ID Mode

When the 7600 inquiries the sample to HOST which has the sample type not specified on the rack, the 7600 sets no sample type. If the HOST has the sample type correspond to rack number , the position and the barcode, It can be responded by this sample type. In this rack, some type of sample is set on the one rack.

(3) Analytical Data Transmission

The 7600 will transmit the result to the HOST in order as soon as analytical data for one sample from each analyzer unit is completed. Regarding QC sample and Calibrator, the analytical data of QC sample is transmitted to the HOST by Analyzer Unit and that of Calibrator is transmitted to the HOST by Analytical Chemistry (Application code).

Analytical data is transmitted differently from the order that the racks are supplied since analysis time (reaction time) will vary according to the analytical tests and also carrier route to the analyzers will vary according to the request patterns. The Texts for analytical data will vary according to the types of samples. Types of analytical data transmitted during a Realtime Communication is shown in Table 7-2-5.

Table 7-2-5 Types of Analytical Data

Sample Type		Types of Analytical Data
Patient Samples		Patient Sample Analytical Data
Standard Samples	Photometric Test	Photometric Calibration Data
	ISE Test	ISE Calibration Data
	Elecsys Test	Elecsys calibration Data
Control Samples		Control Sample Analytical Data

(4) Automatic Rerun Test Selection Information Reception

(a) Sample Types

Automatic Rerun is performed only for Routine samples and for STAT samples. It will not be performed on other samples. Furthermore, automatic Rerun selection information is accepted during analysis and only for those samples that have completed the analytical data transmission to the HOST. Request for samples other than those will become an error.

(b) Decision for Rerun and Reception Timeout Error Procedures

The Unit will perform automatic Rerun decision as soon as Automatic Rerun Selection Information from the HOST is received. To perform or not to perform a Rerun is decided according to whether there is/not a Rerun Selection Information is registered in the patient database. As a result of the Rerun decision, racks that require Rerun will be rerouted to the Rack ID and Sample ID readers through the Rerun line. Racks that do no require Rerun will be collected at the rack Unloader. However, the rack that include samples that has become Reception Timeout will be made to require a Rerun whether there is a Rerun Selection Information or not. In this case, if

there is one other sample which corresponds to the key information, the patient database registers information as that sample.
Reception timeout can be set at the GUI [Utility[-[System]-[Host Communication].

(c) Accepted Key Information

Key information that will be accepted by the Unit are same as those explained previously in Table 7-2-3. It will become an error if it differs from those sent during Analytical Data transmission.

(d) Masking Due to Insufficient Sample

As for the automatic Rerun, other than Automatic Masking and Manual Masking explained previously, an analysis will not be performed for the samples that has became insufficient during initial analysis.

(5) Automatic Rerun Selection Inquiry

(a) Key Information Used for Inquiry

Use the same key information used for the initial inquiry. To inquire, add classification for whether it is the first time or Rerun. An inquiry text message contains information of one sample.

(b) Samples for Inquiry

Inquiry will be made for samples which occurred a reception timeout error. These samples include the sample of which 7600 received the test selection information after time out is occurred.

(c) Masking Due to Insufficient Sample

Inquiry of Automatic Rerun Selection Information will not be made for the samples that has become insufficient.

(d) Procedures for Reception Timeout Error

Inquiry will not be made for the next sample until either all of the test selection information inquired for the sample are received or reception timeout error occurs. Therefore, analysis will be delayed during that time. If a reception timeout occurs, shift to inquiry for the next sample after issuing a cancellation request for the inquired sample. For the details regarding cancellation requests, refer to “7600 Host Communication Interface Specifications.” Reception timeout can be set at the GUI [Utility]-[System]-[Host Communication]. (Refer to Chapter 7.3.5(10))

(e) Test Selection Information Used for Analysis

Alarm will be registered if a response for the inquiry is not received and an analysis is performed for Rerun Selection Information automatically generated by the 7600. Default Test Selection Information is not used for Rerun analysis. Relationships between Test Selection Information in the 7600 and a requests from a HOST are shown in Table 7-2-6.

Table 7-2-6 Test Selection Information Used for Automatic Rerun

Run Type	TS from HOST	TS in the 7600		Rerun
		Unit Defined TS	Default TS	
Routine, STAT	¡	¡	-	Rerun with TS from HOST and 7600
Sample	¡	X	-	Rerun with TS from HOST and 7600
	X	¡	-	Rerun TS decided by the Unit
	X	X	-	No analysis

¡ : There is both a record and a request,
X: No record or there is a record but no request,
-: Invalid

TS: Test Selection Information

(6) Automatic Rerun Analytical Data Transmission

Same as the first time, the result will be transmitted to the HOST in order as soon as analytical data of one sample from all of the analyzers is completed. Transmits separately from the first time measurement.

7.2.3 BATCH COMMUNICATIONS

Batch Communication function is shown in Table 7-2-7. Each of the communication functions will be explained in details below.

Table 7-2-7 Batch Communication Function Table

Communication Functions	Request Originator	Patient Sample			Standard Sample	Control Sample
		Routine	STAT	Rerun		
Test Selection Information Reception	HOST	¡	¡	¡	X	X
Analytical Data Transmission	HOST	¡	¡	¡	X	X
	GUI	¡	¡	¡	X	¡
Reaction Process Data Transmission	GUI	¡	¡	¡	X	¡

(¡ : Will be performed, X: Will not be performed)

(1) Test Selection Information Reception

A HOST can register Test Selection Information of the patient sample in the 7600 with timing options. Since there are large amounts of information to be exchanged with a HOST, it is recommended that the Test Selection Information be registered before performing an analysis with this function to lighten the communication load during an analysis.

(a) Key Information Used for Registration

Same as Realtime Communications, type of key information to be registered in the database in the 7600 will vary. If a key information of a patient sample that is same as the one already registered is received, it will be over written, however, if it does not exist, it will be registered as a new sample. Key information to be registered in the database in the 7600 for Batch Communications is shown in Table 7-2-6.

Table 7-2-8 Key Information Used to Register in the 7600 Database

Analysis Mode	Key Information				
	Sample Type	Sample Type	Sample Number	ID Number	Rack Position
Sample Number Mode	Routine Sample	¡	¡	X	X
	STAT Sample	¡	0 fixed	X	¡
	Rerun Sample	¡	¡	X	X
ID Mode	Routine Sample	¡	X	¡	X
	STAT Sample	¡	X	¡	X
	Rerun Sample	¡	X	¡	X

Set the range for the rack number of the rack to hold a patient sample at the GUI for every Sample Type. For STAT samples, it will be an error for rack position and Sample Type to be outside the GUI settings.

(b) Number of Samples Possible for Registration

Number of patient's samples that are possible to register in the 7600 database, for both routine and STAT together, is 10,000 samples. Due to this restriction, an error will occur if the Test Selection Information received from a HOST is unable to be registered.

(c) Number of Tests Possible for Registration

a batch and real time -- the number of tests per [which can be registered into the database] sample is to 100 tests except for that which the result has come. It becomes an error when the number of request items received from HOST is over 100. Moreover, it becomes an error also when the number of tests exceeds 100 to add the number of tests in a database.

(2) Analytical Data Transmission

As a method of transmitting analytical data in one lump, an instruction can be given from the Unit's GUI or from a HOST.

(a) Instruction from GUI

It is initiated from Data Review Screen. An analytical data from multiple patient samples selected from a list as well as control samples are lumped together and transmitted to the HOST.

(b) Request from a HOST

Analytical data of a patient sample requested from a HOST will be transmitted. Control samples cannot be requested.

(3) Reaction Process Data Transmission

Implemented through instructions from the Unit's screen (GUI). There is a method to transmit reaction process during a graph display and a method of transmitting by making multiple selections from a patient list.

(4) Elecsys Raw Data Transmission

Implemented through instructions from the Unit's screen (GUI). There is a method of transmitting by making multiple selections from a patient list.

7.2.4 CONTENT OF THE COMMUNICATION TEXT

Communication texts are shown in Table 7-2-9. The following will show detailed descriptions of each of the texts. For Communication Text format, refer to "7600 Host Communication Interface Specifications."

Table 7-2-9 Communication Text Table

Communication Text	Communication Direction	Realtime Communication	Batch Communication
Test Selection Inquiry	7600 → HOST	¡	X
Automatic Rerun Selection Inquiry	7600 → HOST	¡	X
Test Selection Information	HOST → 7600	¡	¡
Automatic Rerun Selection Information	HOST → 7600	¡	X
Patient Sample Analytical Data	7600 → HOST	¡	¡
Photometric Calibration Data	7600 → HOST	¡	X
ISE Calibration Data	7600 → HOST	¡	X
Elecsys Calibration Data	7600 → HOST	¡	X
Control Sample Analytical Data	7600 → HOST	¡	¡
Reaction Monitor Data	7600 → HOST	X	¡
Elecsys Raw Data	7600 → HOST	X	¡
Analytical Data Transmission Request	HOST → 7600	X	¡

(¡ : Available, X: Unavailable)

(1) Test Selection Inquiry

Inquiry for Test Selection is performed by the Sample Activity. Content of one sample is shown in Table 7-2-10.

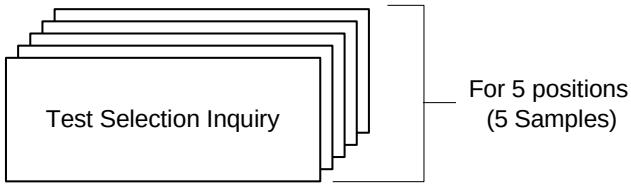


Table 7-2-10 Information for Test Selection Inquiry for One Sample

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Routine, STAT
2	Identification Detail Code	-	-	1	First time, Rerun
3	Sample Type	-	-	1	1.Blood serum / Plasma, 2:Urine, 3:CSF, 4: Suprnt Others
4	Sample Number	Routine STAT	ID	1	Reserve
			S.No	1	1 ~ 60,000
5	Rack Number	(Note 1)	-	1	Range will vary according to sample type. (Note 1)
6	Position Number	-	-	1	1 ~ 5
7	ID Number	-	ID	1	Sample barcode
			S.No	1	Patient comment

(Note 1) Refer to "1.3, Method of Operation of the Unit" System Mode ---ID: ID Mode, S.No: Sample Number Mode

(2) Automatic Rerun Selection Inquiry

Automatic Rerun Selection inquiry is also performed by the Sample Activity. Contents for one sample is shown in Table 7-2-11. Inquiry will not be made for the sample that have become insufficient in the first analysis.

Table 7-2-11 Inquiry Information for Automatic Rerun Selection for One Sample

No.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Routine, STAT
2	Identification Detail Code	-	-	1	Automatic Rerun
3	Sample Type	-	-	1	1: Blood serum / Plasma, 2: Urine, 3: CSF, 4: Suprnt, Others
4	Sample Number	Routine STAT	ID	1	Reserve
			S.NO	1	1 ~ 60,000
5	Rack Number	(Note 1)	-	1	Range will vary according to sample type.
6	Position Number	-	-	1	1 ~ 5
7	ID Number	-	ID	1	Sample barcode
			S.NO	1	Patient comment

(3) Test Selection Information and Automatic Rerun Selection Information

Realtime Communications will not accept samples other than those inquired. Batch Communications will accept optional samples. Tests to be placed on the communications text will become same as Realtime Communications and Batch Communications. Contents of the Test Selection Information for one sample is shown in Table 7-2-12.

Table 7-2-12 Test Selection Information for One Sample

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Routine, STAT
2	Identification Detail Code	-	-	1	First time, Rerun
3	Sample Type	-	-	1	1: Blood serum / Plasma, 2: Urine, 3: CSF, 4: Suprnt, 5: Others
4	Sample Number	Routine STAT	ID	1	Reserve
			S.NO	1	1 ~ 60,000
5	Rack Number	-	-	1	Range will vary according to sample type. Refer to Table 1-1.
6	Position Number	-	-	1	1 ~ 5
7	Cup Identification	-	-	1	1: Standard cup, 2: Micro cup
8	ID Number	-	ID	1	Sample barcode
			S.NO	1	Patient comment
9	Application Code	-	-	1000	Photometric: 1~910 Elecsys: 1001~1910 ISE: Na=989, K=990, Cl=991 Serum Index: L=992, H=993, I=994 ~~Caution:~~ ~~Only following combination are allowed;~~ ~~ISE: (Na, K), (Na, K, Cl)~~ ~~Serum Index: (L,H,I)~~ ~~Calculated Test is automatically calculated when all required test aelection are ordered.~~
10	Requested Information	-	-	100	TS Clear, Standard Sample Volume, Decreased Sample Volume, Increased Sample Volume, Dilution Ratio
11	Patient Comment [1]	-	-		100 characters
12	Age Activities [1]	-	-		Day, Month, Year
13	Age [1]	-	-		1 ~ 200
14	Sex [1]	-	-		Male, Female
15	Blood Collection Date [12]	-	-		Year, Month, Day, Hour, Minute, Second.

[1] Not transmitted if "Comment Transmission" explained in Chapter 5 (Operational Criteria Settings) is not set.

[2] Year Range is from 1970 to 2035

(4) Patient Sample Analytical Data

Test to be put on the communication text will become same with Realtime Communications and Batch Communications. Content of a patient sample analytical data for one sample is shown in Table 7-2-13.

Table 7-2-13 Analytical Data for One Sample

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identifications	-	-	1	Routine, STAT
2	Identification Detail Code	Routine, STAT	-	1	First time, Rerun~~, Automatic Rerun~~ (not used for the New mode)
3	Sample type	-	-	1	1: Blood serum / Plasma, 2: Urine, 3: CSF, 4: Suprnt, 5: Others
4	Sample Number	Routine STAT	ID	1	Reserve
			S.NO	1	1 ~ 60,000
5	Rack Number	-	-	1	Range will vary according to sample type. Refer to Table 1-1.
6	Position Number	-	-	1	1 ~ 5
7	ID Number	-	ID	1	Sample Barcode
			S.NO	1	Screen Display Comment
8	Application Code	-	-	16000	Photometric: 1~910 ISE: Na=989, K=990, Cl=991 Serum Index: L=992, H=993, I=994 Caution: Only following combination are allowed; ISE: (Na, K), (Na, K, Cl) Serum Index: (L,H,I) Calculated Test : 961~968
9	Request Information	-	-	100	Standard Sample Volume, Decreased Sample Volume, Increased Sample Volume, Dilution Ratio
10	Analytical Result	-	-	100	Code with decimal point 6 byte character [3]
11	Analytical Result Activity	-	-	100	6 byte character
12	Indication of the test	-	-	100	First time, Rerun
13	Data Alarm	-	-	1	Refer to 4.10 in this document
14	Date of Analysis	-	-	1	Year, Month, Day, Hour, Minute, Second
15	Operator ID	-	-	1	ID of the Operator who performed the analysis
16	Patient Comment[4]	-	-	1	100 characters
17	Age Activities [3]	-	-	1	Day, Month, Year
18	Age [3]	-	-	1	1 ~ 200
19	Sex [3]	-	-	1	Male, Female
20	Blood Collection Date [3]	-	-	1	Year, Month, Day, Hour, Minute, Second

[3]When a qualitative analysis is specified by the GUI, it will be shown in 6 levels as shown in Table 7-2-14.
[4]Will not be transmitted if the Comment Transmissions explained in Chapter 5 (Operational Criteria Settings) is not set.

Table 7-2-14 Qualitative Analysis Transmission Data

Item	Analytical Result Range	Transmission Data
Photometric	Analytical Result <= Qualitative Analysis Concentration 1	-2
	Qualitative Analysis Concentration 1 < Analytical Result <= Qualitative Analysis Concentration 2	-1
	Qualitative Analysis Concentration 2 < Analytical Result <= Qualitative Analysis Concentration 3	0
	Qualitative Analysis Concentration 3 < Analytical Result <= Qualitative Analysis Concentration 4	1
	Qualitative Analysis Concentration 4 < Analytical Result <= Qualitative Analysis Concentration 5	2
	Qualitative Analysis Concentration 5 < Analytical Result	3
Elecsys	Qualitative standard High <= Measured Data	1
	Qualitative standard Low < Measured Data <= Qualitative standard High	0
	Measured Data <= Qualitative standard Low	-1

(5) Photometric Calibration Data

Transmitted only during Realtime Communications. Content of the Photometric Calibration Data for one test is shown in Table 7-2-15.

Table 7-2-15 Photometric Calibration Data for One Test

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	3: Standard test
2	Analytical Unit Name	-	-	1	See Section 5 (11) Photometric Calibration Result Record (6)
3	Application Code	-	-	1	Photometric: 1~910
4	Test Alarm	-	-	1	Refer to 4.10 of this document
5	Analytical Result	-	-	24	Refer to Section 5 (11) Photometric Calibration Result Record (9)
6	SD Value	-	-	1	Code with decimal point 6 byte characters
7	Operator ID	-	-	1	ID of the Operator who performed the analysis

(6) ISE Calibration Data

Transmitted only during Realtime Communications. Contents of the ISE Calibration Data for one test is shown in Table 7-2-16.
However, for ISE, the number of tests for “Na, K” analysis is 2 tests and “Na, K, Cl” is 3 tests; combinations other than these do not exist.

Table 7-2-16 ISE Calibration Data for One Test

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	3: Standard test
2	Analytical Unit Name	-	-	1	ISE1, ISE2
3	Test Alarm	-	-	1	Refer to 4.10 of this document
4	Analytical Result [5]	-	-	8	Section 5 (12) ISE Calibration Result Record (12)~(14)
5	Data Alarm [5]	-	-	8	Refer to 4.10 of this document
6	Operator ID	-	-	1	ID of the Operator who performed the analysis

(7) Elecsys Calibration Data

Table 7-2-17 Elecsys Calibration Data for One Test

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Standard Sample
2	Analytical Unit Name	-	-	1	Name of the Elecys module
3	Test Alarm	-	-	1	Application code
4	Calibration Method	-	-	20	Method of the calibration
5	Rack Pack Lot No.	-	-	1	Measured Rack Pack Lot No.
6	Rack Pack No.	-	-	1	Measured Rack Pack No.
7	Expired Rack Pack Flag	-	-	1	Rack pack is expired or not
8	Calibrator Lot No.	-	-	1	Measured Calibrator Lot No.
9	Result Status	-	-	1	Calibration is successful or not
10	Target Value	-	-	1	Target Value for the quantitative tests
11	Unit	-	-	1	The unit of the calibration
12	Cut off	-	-	1	Cut off index for the qualitative tests
13	Border Line Area	-	-	1	Lower Limit and Upper Limit for the qualitative test
14	Measurement Date	-	-	1	year, month, day, hour, minute, second
15	Oparator ID	-	-	1	ID of the Operator who performed the analysis

(8) Control Sample Analytical Data

A test to be placed on the communication text will be same with Realtime Communications and Batch Communications. Content of the control sample analytical data for one sample is shown in Table 7-2-17.

Table 7-2-18 Control Sample Analytical Data for One Sample

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Control sample
2	Identification Detail Code	-	-	1	First time
3	Sample Type	-	-	1	1: Blood serum / Plasma, 2: Urine, 3: CSF, 4: Suprnt, 5: Others
4	Control Number	-	-	1	1 ~ 60
5	Sequence Number	-	-	1	1 ~ 150
6	Rack Number	-	-	1	Refer to Product Specifications
7	Position Number	-	-	1	1 ~ 5
8	Control Name	-	-	1	Screen input characters
9	Application Code	-	-	100	Photometric: 1~910 ISE: Na=989, K=990, Cl=991 Serum Index: L=992, H=993, I=994 Caution: Only following combination are allowed; ISE: (Na, K), (Na, K, Cl) Serum Index: (L,H,I) Calculated Test : 961~968
10	Request Result	-	-	100	Standard Sample Volume
11	Analytical Value	-	-	100	Code with decimal point 6 byte characters
12	Analytical Result Activity	-	-	100	6 byte characters
13	Data Alarm	-	-	100	Refer to 4.10 of this document
14	Date of Analysis[5]	-	-	1	year, month, day, hour, minute, second
15	Operator ID	-	-	1	ID of the Operator who performed the analysis.

[5] Date Range is from 1970 to 2035

(9) Reaction Monitor Data

This functions is only for the Batch Communications. Furthermore, configuration of the text does not rely on the type of samples. Contents of the Reaction Monitor Data are shown in Table 7-2-18.

Table 7-2-19 Reaction Monitor Data for One Test

No.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Routine, STAT, Standard sample, Control
2	Identification Detail Code	Routine, STAT	-	1	First time, Rerun
		Standard Control	-	1	Reserve

Continue **Table 4-13 Reaction Monitor Data for One Test**

No.	Test	Sample	System Mode	Quantity	Contents
3	Sample Type	-	-	1	1: Blood serum / Plasma, 2: Urine, 3: CSF, 4: Suprnt, 5: Others
4	Analysis Unit Number	-	-	1	Refer to Section 5 (13) Absorbance Data Record (4)
5	Sample Number 1	Routine	S.NO	1	1 ~ 60,000
		STAT	ID	1	Reserve
		Control	-	1	1 ~ 60 (Control number)
6	Sample Number 2	Routine	-	1	Reserve
		STAT		1	Reserve
		Control	-	1	1 ~ 150 (Sequence number)
7	ID Number	Routine, STAT	S.NO	1	Patient comments
		-	ID	1	Sample Barcode
		Control	-	1	Control name
8	Rack Number	-	-	1	Refer to Product Specifications
9	Position Number	-	-	1	1 ~ 5
10	Cell Number	-	-	1	P Module: 1 ~ 160, D Module: 1 ~ 240
11	Internal/External Information	-	-	1	1: Internal, 2: External (Only for D Module: P module :Not sent)
12	Reaction Time	-	-	1	1 ~ 22
13	Analysis Date[6]	-	-	1	year, month, day, hour, minute, second
14	Application Code	-	-	1	Photometric: 1~910
15	Analytical Result	-	-	1	6 byte characters
16	Request Information	-	-	1	Standard Sample Volume, Decreased Sample Volume,

[6] Date Range is from 1970 to 2035

					Increased Sample Volume
17	Data Alarm	-	-	1	Refer to 4.10
18	Cell Blank Absorbance	-	-	4	Absorbance data of 2 wavelength disparity
19	Number of Photometry Point	-	-	73	1 ~ 73
20	Reaction Monitor Absorbance	-	-	73	Absorbance data of 2 wavelength disparity
21	Operator ID	-	-	1	ID of the Operator who performed the analysis.

(Note 1) Transmitted only in the mode to transmit comments. Details of the comments are shown in Table 7-2-17.

(10) Elecsys Raw Data

This function is considered only as batch communication. In addition, it does not depend for the composition of a text on the kind of sample. The contents of the Elecsys raw data are shown in Table 7-2-20.

Table 7-2-20 Analytical Data Transmission Request for One Sample

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Routine, STAT
2	Identification Detail Code	Routine and STAT	-	1	First time, Rerun
		Control	-	1	Reserve
3	Sample Type	-	-	1	1: Blood serum / Plasma 2: Urine 3: CSF 4: Suprnt 5: Others
4	Analysis module name	-	-	1	7.3.6 Elecsys Raw Data (effective signal) Record: Refer to (4) of a raw data record.
5	Sample number 1	Routine and STAT	S.NO.	1	1-60000
			ID	1	Reserve
		Control	-	1	1-100 (control number)
6	Sample number 2	Routine and STAT	-	1	Reserve
				1	Reserve
		Control	-	1	1-150 (sequence number)
7	ID number	Routine and STAT	S.NO.	1	Patient comment
		-	ID	1	Sample bar code
		Control	-	1	Control name
8	Rack number	-	-	1	Table 7-2-1 is referred to.
9	Position number	-	-	1	1-5
10	Raw data	-	-	200	Raw data
11	Effective signal	-	-	1	Effective signal value
12	Measurement date (notes 1)	-	-	1	YYYYMMDDHHMMSS
13	Test item code	-	-	1	1-910
14	Measured value	-	-	1	6-byte character

15	Request information	-	-	1	Standard Sample Volume, Decreased Sample Volume, Dilution Ratio
16	Data alarm	-	-	1	Table 7-2 -25 reference
17	Operator ID	-	-	1	The operator ID when measured

(Notes 1) Set the contents of the year to 1970-2035.

(11) Analytical Data Transmission Request

Used by the HOST to request analytical data from the Unit. Contents of the Analytical Data Transmission Request is shown in Table 7-2-21

Table 7-2-21 Analytical Data Transmission Request for One Sample

NO.	Test	Sample	System Mode	Quantity	Contents
1	Sample Identification	-	-	1	Routine, STAT
2	Identification Detail Code	-	-	1	First time, Rerun
3	Sample Type	-	-	1	1: Blood serum / Plasma 2: Urine 3: CSF 4: Suprnt 5: Others
	Sample Number	Routine STAT	ID	1	Reserve
			S.NO	1	1 ~ 60,000
5	Rack Number	-	-	1	Range will vary according to the types of samples
6	Position Number	-	-	1	1 ~ 5
7	ID Number	-	ID	1	Sample Barcode
			S.NO	1	Patient comments

Data Alarm List

Legend of Label

label	Explanation
Alarm code	Alarm code number for HOST
Alarm name	Data Alarm Name
Out Put String	String for Device
Printer	String for 7600 Printer
CRT	String for CRT excepts 7600 print review

label	explanation
Photo	Data Alarm for Photometric test
ISE	Data Alarm for ISE Test
Elecsys	Data Alarm for Elecsys Test
Normal	Normal Sample Testing
STAT	STAT Sample Testing
Ctrl	Control measurement
STD	Standard Measurement

Table 7-2-22 Data Alarm List

Alarm Code	Alarm Name	Out put Str		Photo				ISE				Elecsys				
		Printer	CRT	Norm	Stat	Ctrl	STD	Norm	Stat	Ctrl	STD	Norm	Stat	Ctrl	STD	
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No Alarm
1	ADC Abnormal	ADC?	A	○	○	○	○	○	○	○	○	○	○			
2	Cell Blank Absorbance	Cell?	Q	○	○	○	○									
3	Sample Short	Sampl	V	○	○	○	○	○	○	○	○	○	○	○		DATA can be space
4	Reagent Short	Reagn	T	○	○	○	○	○	○	○	○	○	○	○		DATA can be space
5	Absorbance Over	ABS?	Z	○	○	○	○									
6	Prozone Error	Prozon	P	○	○	○	○									•
7	All Reaction Limit Over	Limt0	I	○	○	○	○									
8	Reaction Limit Over exc. 1 point	Limt1	J	○	○	○	○									
9	Reaction Limit Over exc. 2-3 points	Limt2	K	○	○	○	○									
10	Linearity Abnormal at 9 points or Over	Lin.	W	○	○	○	○									
11	Linearity Abnormal at 8 points or below	Lin8.	F	○	○	○	○									
12	STD1 Absorbance Abnormal	S1Abs?					○									
13	DUPLICATE Error	Dup					○								○	
14	STD Error	Std?					○				○					
15	SENSITIVETY Error	Sens					○									
16	Calibration Error	Calib					○				○					
17	SD Error	SD!					○									
18	Noise Error	Noise	N					○	○	○	○					
19	Level Error	Level	L					○	○	○	○					
20	Slope Error	Slope?									○					
21	Prepare Error	Margin									○					
22	Internal Standard Conc Error	I.Std									○					

23	Sample Reaction Error	R.Over	&					○	○	○						
24	Test to Test Compensation Error	Cmp.T	C	○	○	○		○	○	○						
25	Unable to calculate compensate test	Cmp.T!	M	○	○	○		○	○	○						
26	Upper Technical Limit	LIMTH	$	○	○			○	○			○	○	○		
27	Lower Technical Limit	LIMTL	$	○	○			○	○			○	○	○		
28	Random Error[R-4s]	Random	@			○				○				○		
29	Systematic Error 1 [2-2sA]	Systm1	#			○				○				○		
30	Systematic Error 2 [2-2sW]	Systm2	#			○				○				○		
31	Systematic Error 3 [4-1sA]	Systm3	#			○				○				○		
32	Systematic Error 4 [4-1sW]	Systm4	#			○				○				○		
33	Systematic Error 5 [10xA]	Systm5	#			○				○				○		
34	Systematic Error 6 [10xW]	Systm6	#			○				○				○		
35	QC Error 1	QCErr1	+			○				○				○		
36	QC Error 2	QCErr2	+			○				○				○		
37	Calculation Error	Calc?	%	○	○			○	○							
38	Over Flow	Over	O	○	○	○		○	○	○		○	○	○		Data = SPACE
39	Calculation Test failure	???	X	○	○	○	○	○	○	○	○	○	○	○		Data = SPACE
40	<SPARE>															
41	<SPARE>															
42	Edited Test	Edited	*	○	○			○	○			○	○			This alarm is set to the data which is edited on the data review screen. Alarm can be selected on the screen.
43	Calibration result abnormal	CalErr	!									○	○	○		
44	Repeated Limit Upper Over	ReptH	=	○	○			○	○			○	○			
45	Repeated Limit Lower Over	ReptL	=	○	○			○	○			○	○			
46	ABS maximum over	>AMAX	>	○	○	○										
50	<SPARE>															
51	Response 1	Resp1	:								○					
52	Response 2	Resp2	;								○					
53	Conditioning Error	Condi	/								○					
54	<SPARE>															
55	ISE Range over	Range	r													
56～61	<SPARE>															
62	System Reagent short	SysRg	g									○	○	○		
63～66	<SPARE>															
67	Sample hovering	Smp.h	h									○	○	○		
68	Sample air bubble	Smp.b	k									○	○	○		
69	Reagent hovering	Reag.h	m									○	○	○		
70	Reagent film detection	Reag.f	f									○	○	○		
71	Potential carry over	CarOvr	d									○	○	○		
72	Sample Clot	Clot	e									○	○	○		

73	<SPARE>	Reag.T	y													
74	Reagent disk temperature	Inc.T	t									○	○	○		
75	Incubator temperature	Smp.h	h									○	○	○		
76	System reagent temperature	SysR.T	s									○	○	○		
77	Cell temperature	Cell.T	c									○	○	○		
78～85	<SPARE>															
86	Sample LLD abnormal	SLLD.a	u									○	○	○		
87	Sample LLD noise	SLLD.n	n									○	○	○		
88～92	<SPARE>															
93	Washing buffer temperature	WB.T	z									○	○	○		
94	Washing buffer short	WB	]									○	○	○		
95	Clot pressure sensor ADC underflow	ClotL	[									○	○	○		
96	Clot pressure sensor ADC overflow	ClotH	[									○	○	○		
97	Clot pressure abnormal	ClotX	}									○	○	○		
98	Sample pipetter air bubble	Smp.ib	v									○	○	○		
99	Current range over (during Operation)	OpeC.O	w									○	○	○		
100	Lower signal level	LowSig	<									○	○	○		

7.2.5 OPERATIONAL CRITERIA SETTINGS

Various criteria regarding operations of a HOST can be set at the System Settings Screen in the GUI : [Utility]-[System]-[Host Communication]. This chapter will deal with various types of criteria settings for operations. Criteria settings for operations are shown in Table 7-2-20. Details for the functions will follow.

Table 7-2-23 Table of Criteria Settings for Operations

Item	Overview
Inquiry Timeout	Settings for response timeout for test selection information inquiry
Automatic Rerun Decision Timeout	Settings for automatic Rerun selection information reception timeout for analytical data transmissions
Normal Inquiry	Specify whether to make inquiry even though there is or there is no test selection information
Transmission of Analytical Data Only	Specify whether to limit communications during analysis to only analytical data
Automatic Rerun Selection Information Inquiry	Specify whether to make an inquiry for Automatic Rerun Selection Information
Manual Rerun Selection Information Inquiry	Specify whether to make an inquiry for Manual Rerun Selection Information
STAT Sample Test Selection Information Inquiry	Specify whether to make an inquiry for STAT Sample Test Selection Information
Comment Transmission	Specify whether to transmit comments for patient samples
Communication Trace	Specify whether to perform communication trace
TS Ask in Barcode Read Error	Specify whether to ask the TS in bar code read error sample in ID mode.
Automatic Recovery of Session	Specify whether to restarts the communication session if an error occurs.
TS Priority Mode	Specify whether to transmit other transmission from the instrument until it receives TS from HOST at the time of automatic re-police-inspection at the time of the item inquiry from the instrument.
Control Results Mode Incremental	Specify whether the transmitting timing of a control sample is summarized for every module, and it transmits, or to transmit for every item. Specification of whether to re-connect automatically at the time of communication interception.
QC Additional information	Specify whether a control name is transmitted to the area of ID at the time of control transmission, or to transmit a control lot number.
Sample ID 22 Digits	Specify whether Sample ID is transmitted and received in 13 characters, or to transmit and receive in 22 characters.
New Mode	Specify whether it transmits with HOST by the new protocol, or to transmit with HOST by compatibility with the former.
Rack number definition	Specify whether to transmit and receive the definition of a rack number by compatibility with the former, or new definition.
Application code for HOST	Specify whether the application code for HOST is used for HOST communication, or not to carry out.
Qualitative result transition	Specify whether a measurement result is transmitted by the qualitative item of a Photometric item, or not to carry out.
Review by exception	Specify whether a measurement result with the set-up alarm is transmitted to HOST, or not to carry out.

	(A setup is a system screen)

(1) Inquiry Timeout

This function applies to Test Selection Information inquiry for Realtime Communications, Test Selection Information inquiries for (Routine samples, STAT samples and Rerun samples), as well as Automatic Rerun Selection Information inquiry. An inquiry text message contains information of one sample. Sets the Timeout for 'Response from the HOST' for the inquiry made by the 7600. When there is no timeout set, waits for response from the HOST indefinitely. Analysis will be delayed during that time.

(2) Automatic Rerun Decision Timeout

This function applies to the reception of Automatic Rerun Selection Information in Realtime Communications. Settings for the Timeout for the reception of Automatic Rerun Selection Information from the HOST for the routine analytical data transmitted from the 7600. Rack with any samples that were not responded within a time limit is carried to the Rerun line whether there is or there is no Rerun Selection Information. When there is no timeout set, waits for response from the HOST indefinitely. Analysis will be delayed during that time.

(3) Normal Inquiry

This function applies to the Test Selection Information inquiry for Routine samples as well as STAT samples in Realtime Communications. This does not apply to Test Selection Information inquiry for Rerun samples or Automatic Rerun Selection inquiries. When this function is specified, an inquiry will be made whether the Test Selection Information is in the 7600 or not; however, when not specified, an inquiry will be made only for the samples that do not have the test selections. Whether there is or there is no registration does not matter for the Default Test Selection Information.

(4) Transmission of Analytical Data Only

This function applies to all Realtime Communications. This does not apply to the Batch Communications. When this function is selected, communications during analysis is limited only to the analytical data transmissions and inquiries for the Test Selection Information or Automatic Rerun Selection Information will not be made.

(5) Automatic Rerun Selection Information Inquiry

This function applies to Automatic Rerun Selection inquiry within the Realtime Communications. When this function is specified in the automatic Rerun mode during analysis, an inquiry will be made for the Automatic Rerun Selections; however, when not specified, an inquiry for the Automatic Rerun Selection will not be made.

(6) Manual Rerun Selection Information Inquiry

This function applies to the Test Selection Information inquiry for Rerun samples in Realtime Communication. When this function is specified, an inquiry will be made for the test selections for Rerun samples during analysis; however, when not specified, test selection inquiry will not be made for Rerun samples.

(7) STAT Sample Test Selection Information Inquiry

This function applies to the Test Selection Information inquiry for STAT samples in Realtime Communications. When this function in specified, an inquiry will be made for the test selections for STAT samples during analysis; however, when not specified, test selection inquiry will not be made for STAT samples.

(8) Comment Transmissions

This function applies to all HOST communications. When this function is specified, HOST can register additional patient comments to the Test Selection Information. Furthermore, patient comments stored in the 7600 can be transmitted to the HOST along with analytical data and Reaction Monitor data. Patient comments will not be accepted when it is not specified.

(9) Communication Trace

This function applies to all HOST communications. When this function is specified, the content of the communication with the HOST can be traced to HD. Information traced can be printed by the Print Screen which is shown by Global “Print” Button in the GUI. Used as an analysis tool if a problem occurs.

(10) TS Ask in Barcode Read Error

See 2.2.7 (1)

(11) Automatic Recovery of session

If this check box on, when the session between 7600 and HOST stops by error detection or so, automatically the 7600 starts communication again. Although, the communication is lost during the recovery process from stop of communication to restart of it.

(12) TS Priority

This function is adapted for an automatic re- selection information inquiry with the item selection inquiry in real-time communication. It is made to perform all other communications until it receives the item request communication from HOST from the instrument after the first time measurement result transmission at the time of an item selection inquiry or automatic re- inquiry specification or becomes a timeout. When this mode is specified, specification of a timeout turns into specification by 1 to 18 seconds. Timeout time becomes 18 seconds when the check of a timeout is removed. However, only a serviceman can change this function.

(13) QC result (Control Results Mode Incremental)

This function is adapted for transmission as a result of the control sample in real-time communication. When this function is specified in the analysis, whenever a result goes up from an analyzer unit , it transmits to HOST for every test When not specified, as soon as all results are equal to every module or channel (ISE, immunity), it transmits to HOST

(14) QC Additional information (QC Additional Information)

This function is adapted for transmission, reaction process transmission, and raw data transmission as a result of a control sample A control name is controlled when a control name is specified. When a lot number is specified, it controls. What is carried out in the lot number can be transmitted to the ID number of a control sample as ID (comment)

(15) ID 22 characters

This function is adapted for HOST communication at large When this function is specified, an ID number can be transmitted and received in 22 characters by communication with HOST When not specified, only the sample of the ID number to 13 characters is transmitted and received. When it is going to transmit the sample of ID exceeding 13 characters, it cannot transmit Moreover, when the sample of ID exceeding 13 characters is received, it considers as a communication error and a sample is not received

(16) New Mode

This function is adapted for HOST communication at large When this function is specified, it is New by communication with HOST. The communication text in the mode is adopted When this function is not specified, the communication text in compatible mode is adopted

(17) Rack number definition

This function is adapted for HOST communication at large When this function is specified, a rack number is communicated according to Table 7-2-23 by communication with HOST

Table 7-2-23 Conventional rack number and new rack number

Sample kind	Rack kind	The conventional rack number	A new rack number
General sample	Common rack	5001-8999	0001-3999
Urgent sample	Urgent rack	4001-4999	E0001-E0999
Rerun sample	Rerun rack	A001-A999	R0001-R0999
Control sample	Control rack	3001-3999	C0001-C0999
Standard sample	Standard rack	2001-2999	S0001-S0999

Change of a new rack number

(18) Application code for HOST

This function is adapted for HSOT communication at large. When this function is specified, HOST communication is changed and carried out not according to the application code registered into this instrument by communication with HOST but according to the application code set up in [utility]-[system]-[HOST setting]-[HOST Application]. Alarm is generated when there is an application code which is not convertible, and HOST communication is set to On. Then, although analysis is possible, when there is an application code which is not convertible, alarm is generated, and the sample is not transmitted [analysis] and received.

(19) Qualitative item measurement result transmission

this function -- a result -- transmission and reaction process transmission -- and -- raw -- it is adapted for data transmission. When this function is specified, it comes to transmit the measurement result other than a qualitative judgment value to the result of the qualitative item of

(20) Review by exception

[Utility] - [a system] - In [Review by exception], what shall not transmit to HOST by the data alarm added to the measurement result can be specified [of an operation part] This function is not concerned with the first time, rerun, a batch, and real time, but is applied to data transmission as a result of a general sample and an urgent sample It is applied to neither transmission of reaction process and raw data, nor a control sample and a standard sample
Only the measurement result to which the data alarm set up so that it might not transmit was added is not transmitted to HOST The other measurement result is transmitted When the measurement result data transmitted at the time of transmission on real time is lost, only the information on a sample is transmitted to HOST for automatic in HOST etc

7.2.6 ERROR PROCESSING

This section describes the communication error which the application layer detects. Moreover, about the error which an ASTM higher rank layer level program detects, it is 7.3.6. About the error which an ASTM low rank layer level program detects to (16), it is 7.3.7. It is shown in (5).

(1) Communication Errors Detected at the Application Layer

Communication errors detected at the application layer are shown in Table 7-2-24.

Table 7-2-24 Table of Communication Errors

Communication Functions	Alarm Code		Overview	*1
	Major	Minor		
Reception Text Error	110	1	Text content received from the HOST is abnormal. (Becomes an error when information received is other than what is noted in 4. Communication Text.)	N
Test Selection Information Reception Error	111	2	No response for the inquiry within a set time in GUI: [Utility]-[System[-[Host Communication]	N
		3	No response for the inquiry within 10 minutes.	
		5	Application code requested by the HOST is not registered in the 7600; or received application code other than Photometric test, ISE test or serum index test.	N
		6	Received request for other than pair of Na, K or Na, K, Cl for ISE.	N
		7	Received request for increased or decreased quantity for other than Sample Type 2 of ISE test	N
		8	Received request for ISE test is wrong.	N
		9	Received request for serum index test is wrong.	N
		10	Received comment even though the mode was set for no transmission of comments.	S
Automatic Rerun Selection Information Reception Error	112	2	No response for the inquiry within a set time in GUI: [Utility]-[System]-[Host Communication]	N
		3X	No response for the inquiry within 10 minutes. No response for the inquiry within a set time	
		5	Application code requested by the HOST is not registered in the 7600; or received application code other than Photometric test, ISE test or serum index test.No response for the inquiry within 10 minutes	N
		6	Received request for other than pair of Na, K or Na, K, Cl for ISE. Received other than test selection information as a response for the inquiry	N
		7	Received request for increased or decreased quantity for other than Sample Type 2 of ISE	N

			test Application code requested by the HOST is not registered in the 7600; or received application code other than Photometric test, ISE test or serum index test	
		8	Received request for ISE test is wrong. Received request for other than pair of Na, K or Na, K, C1 for ISE test	N
		9	Received request for serum index test is wrong. Received request for increased or decreased quantity for other than two classes of ISE test	N
		10	Received comment even though the mode was set for no transmission of comments. Received request for increased quantity for two classes of ISE test	S
HOST communication text error	340	101	A sample number is outside the range.	x
		102	Sample classification is outside the range.	x
		103	Rack ID is outside the range.	x
		104	A cup position is outside the range.	x
		105	A sample sub-type is outside the range.	x
		106	An application code is outside the range.	x
		107	The amount of samples is outside the range.	x
		108	Blood collection date and time (year) is outside the range.	x
		109	Blood collection date and time(month) is outside the range.	x
		110	Blood collection date and time(day) is outside the range.	x
		111	Blood collection date and time (hour) is outside the range.	x
		112	Blood collection date and time (minute) is outside the range.	x
		113	Blood collection date and time (second) is outside the range.	x
		114	Age is outside the range.	x
		118	Sample ID is invalid.	x
		119	Dilution ratio is not within the limits.	x
		120	The number of TS(s) is over the number of regulations.	x
		121	Sample ID is invalid.	x
		124	Sample ID is invalid.	x

*1: N: Test request information in this sample is not accepted by 7600 ,, S: Test request information is accepted by 7600 without comment, - : See Minor 2.

7.3 HOST COMMUNICATION –ASTM- UPPER LAYER/LOWER LAYER I/F SPECIFICATION

7.3.1 OVERVIEW

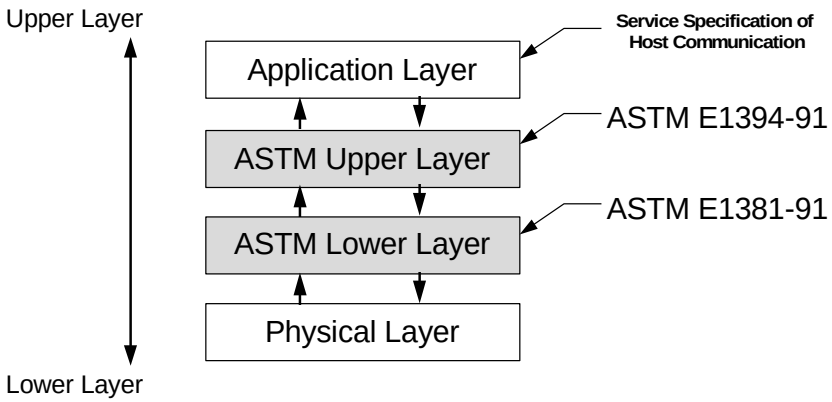
(1) Forward

This specification deals with Host Communication Interface for the 7600. This Interface regulates data transmissions between the CORE of the 7600 and the HOST computer.

(2) Background

A plan was introduced in the recent years by ASTM (American Society of Testing and Material) for standards E1381-91 (Specification for Low-Level Protocol to Transfer Messages Between Clinical Laboratory Instruments and Computer Systems) and E1394-91 (Standard Specifications for Transferring Information Between Clinical Instruments and Computer System) for communications between Automatic Analyzers and Host Computers.
The basic specifications of the standards are regulated on X12 of ANSI. Standardization of this type of communication is being done not only in the Medical Instrument field.
Because of these trends, a Host Communication Interface was installed in the 7600 that meets the standard of the above mentioned ASTM.

Fig. 7-3-1 Structure of Host Communication Layer



7.3.2 SPECIFICATIONS FOR THE PHYSICAL LAYER (Electrical Specifications)

Table 7-3-1 Physical Level Specifications

Item	Specifications	Remarks
Communication Speed	4800, 9600 bps,19200bps	Specified in GUI
Character Configurations	Refer to the table below	Specified in GUI
Communication Port	1	
Electrical Signal	In accordance with EIA-232-D-1986	
Cable Length	Maximum 15m	

One character is made up of one start bit + data bit + parity bit + stop bit.

Data bit, parity bit and stop bit are selected from the table below.

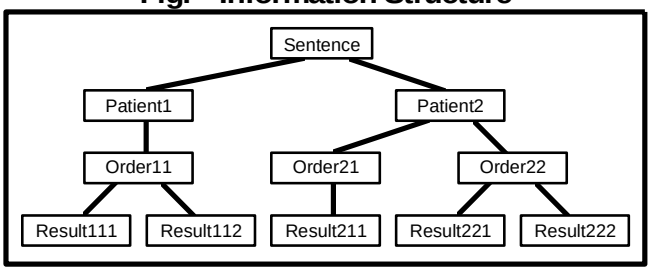
Table. 7-3-2 Character Configurations

No.	Data Bit	Parity Bit	Stop Bit
1	7 bits	even	2 bits
2	7 bits	odd	2 bits
3	7 bits	even	1 bit
4	7 bits	odd	1 bit
5	8 bits	none	2 bits
6	8 bits	none	1 bit
7	8 bits	even	1 bit
8	8 bits	odd	1 bit

7.3.3 OVERVIEW OF THE ASTM COMMUNICATION AGREEMENT

Sentences that are exchanged between Analyzers and Hosts may include multiple test requests for multiple patients and their results at one time.
Generally, this information is expressed in a hierarchy. Which means, the sentences that expresses the information will include multiple patients and each of the samples will include multiple test orders; furthermore, each of the test orders will include multiple results. (Refer to the following Figure.)

Fig. Information Structure



ASTM maps this hierarchy in one-dimension, referred to as communications. For example, the above hierarchy can be expressed as in the following summary.

Beginning of the communication sentence - Patient (Patient1) - Test Order (Order11) - Result (Result111) - Result (Result112) - Patient (Patient2) - Test Order (Order21) - Result (Result211) - Test Order (Order22) - Result (Result221) - Result (Result223) - End of communication sentence

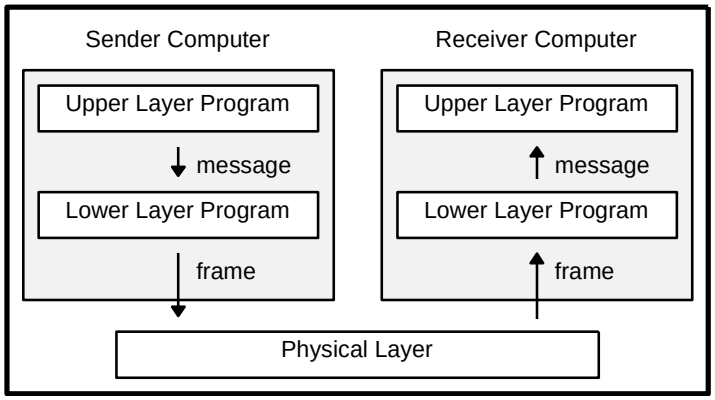
When a communication program finds a result in a communication sentence, it will go backwards into the sentence received, and interpret it as the result for the latest request for the test information; furthermore, it will interpret it as the result for the latest test information. In a sentence, levels for the samples, test requests and results are recognized in this manner . As mentioned above, the first number of the line for the samples, test orders and results are referred to as Sequence Numbers, and they signify “serial numbers for the information of the current level.”

Note: It is Patient Record in the ASTM; however, in 7600, it performs management of the Sample Data. and not management of Patient Data. Management of the Patient Data is performed by the Host computer.

7.3.4 ASTM COMMUNICATION PROGRAM ARCHITECTURE

Program to perform communications, based on ASTM, is divided into Upper Layer Programs and Lower Layer Programs.
In the Upper Layer, the messages for transmissions are constructed and transferred over to the Lower Layer. It also receives messages from the Lower Layer and interprets it. The message expresses sentences with more than one meanings; how to write these sentences and syntax is regulated by the ASTM.
In the Lower Layer, the messages transmitted from the Upper Layer is processed to be sent to the Physical Layer, and it also uses the reception data (Frame) received from the Physical Layer to construct reception messages. Physical Layer refers to the Communication Medium; for example, is a generic term for medium such as Serial Communications or Ethernet. The Physical Layer has reliability and transmission speed characteristic of the medium; messages that are decomposed to correspond with the characteristics of the medium becomes a Frame.

Fig 2-2 Structure of Communication Program



ASTM regulates this decomposition method for the Serial Communications.
The following chapter will explain the syntax (ASTM syntax) for the messages transmitted by the Upper Layer and construction method to decompose and assemble messages in the Lower Layer (ASTM Lower Layer).

7.3.5 ASTM SYNTAX

Structure of the sentences to be transferred, according to ASTM Communication Regulation, will be explained here. Between an 7600 and a Host, various data such as Test Requests and Results will be transferred back and forth; all of these data conforms to this syntax.

(1) Definition of Words

(a) Message

A Message is constructed with an arrangement of several records (refer to the next item). It is the smallest unit of information transferred between a Host and a 7600. A Messages begin with a “Message Header Record” that indicates the beginning of a message and end with a “Message Termination Record” that indicates the end of a message.

(b) Record

A Record is constructed from several fields (refer to the next item) and expresses a single purpose (such as to specify result reports or test requests). A Record may be repeated or used singularly in a message. Code that indicates the purpose of that Record is noted in the first character of that Record.

(c) Field

A Field is the ASTM’s smallest element to construct information. Attributes for a Field (name, format, meanings) are defined in units in a Record.

(2) Coding Rules for the Messages

This section deals with message coding rules, as well as special characters such as delimiters to develop messages provided by Records and Fields.

(a) Kanji

<<This section is prepared for Japanese document>>

(b) End of Record Character

Characters indicating end of a Record. ASCII CR character (HEX 0D) is always used.

(c) Field Delimiter = vertical bar ‘|’

Character to separate Fields that are next to each other in a Record. This is also a delimiter for the first Record ID (character that appears in the beginning of a record) and the next Field.

According to the 2nd character that appears in the Message Header Record (record that appears in the front of a message), a field delimiter can be defined with an optional character other than the message; however, it is recommended that '|' is used.

(d) Repeat Delimiter = backslash '¥'

When a Field is constructed by same data repeated several times, it is referred to as Repeated Field. The delimiter between the repeated items for the Repeated Field is the Repeat delimiter. Repeat delimiter can be defined with an optional character through the Message Header Record; however, it is recommended that '¥' is used.

(e) Component Delimiter = caret '^'

When a Field is constructed by several elements, it is referred to as Component Field. Delimiter between these elements is the Component delimiter. The Component delimiter can be defined with an optional character through the Message Header Record; however it is recommended that '^' is used.

(f) Escape Character = ampersand '&'

An Escape character is provided to indicate delimiter for the Fields that includes general text. When this character occurs in a relevant field, the next character will hold a special meaning (discussed below). An Escape character can be defined with an optional character through the Message Header Record; however, it is recommended that '&' is used.

(g) Expression of Special Characters with Escape Character

The following Escape sequence (start with & and end with &) is defined. When this sequence is detected in a Field, it will be changed to a corresponding character and deleted.

&F&	Indicates Field delimiter
&S&	Indicates Component delimiter
&R&	Indicates Repeat delimiter
&E&	Indicates Escape

Escape sequences other than these are skipped and treated as NULL value.

(h) Message Transmission Process

Following is the procedures for message transmissions by the Upper Layer programs.

(1)Records defined in the message is coded in order as shown in the procedures below.

a)For the first character, input Record ID.
b)Code the Fields for the Record in the order listed below.
  i)Input Field delimiter.
  ii)No input when there is no data
  iii)When there is data but NULL value (clearly indicate to Clear Data), input ""(two double quotation marks).
  iv)If it is a Component Field, follow the procedure below.
    (a)If there are more than two component elements, partition between them with Component delimiters.
    (b)When there is a data but NULL value (clearly indicate to Clear Data), input ""(two double quotation marks).
    (c)When there is no Field, do not input any character in its element.
    (d)When there is no Field and if this is the last element, it is not necessary to partition them with Component delimiters.
    For example, the following two indicates the same Field.

|A^B^^| and |A^B|

(v)For Repeated Fields, partition between the repeated items using the Repeat delimiter.

(vi)If it is not any of the above, then input by changing to the character string according to format of the data.

c)Step (b) must be repeated as long as there are data remaining. When there is no data remaining in any of the items, it is not necessary to use delimiter to indicate all the non-existing data. (Although they can be indicated.) For example, the following two indicates the same Record.

A|B||| and A|B

d)Input Carriage Return character (HEX 0D) as the end of the Record.

(2)Repeat from step (1) for the next Record.

(I) Message Reception Processing

The following is the processing procedure for the Upper Layer program to receive messages.

1. As a reception side, unnecessary repeating will be ignored for all Records that are not expected, Fields and Component Element.
2. When there is no Record expected, it will be interpreted as all the Field values do not exist.
3. When there is no Field or Component Element expected, it will be interpreted as their Field or Component Element values do no exist.
4. If determination cannot be made for it they exist or else NULL value, it will be interpreted as NULL value.
5. Interpret and processes data received.

(3) Field Attributes

Table for Definition of Records defines attributes for a Field for the construction of a Record. Types of attributes held by a Field is explained below.

No.	Attribute	Description
1	Order	Position of the Field. Order which the relevant Fields appear in a Record.
2	Field Name	Name of the relevant Field.
3	Maximum Length	The maximum value of the number of valid characters for the relevant Field excluding escape delimiters.
4	Valid	Indicates whether this Field is valid or not in a Record. A Field without ' ¡ ' in the Valid means that even though it is provided by the ASTM it may be ignored when received.
5	Repeat	Whether a Field will be repeated or not. N: Will not repeat Y: Will repeat Numerical Value: Number of times it will be repeated
6	Format	Format for a Field is one of the following: ŸST: String: A character string ŸTX: Text: A group of character strings that can be printed at the terminal. It is an optional character string; however special escape sequence is defined for a display at the terminal. ŸNM: Numeric: Numeric Value. + or - is added in the beginning; if it is not indicated, it will be treated as +. If decimal point is not included, it will be treated as an integer. There is no restriction for placing '0' in the front and for '0s' placed at the end of numbers with decimal point. ŸDT: Date. Always use 4 digit Christian year. Format is YYYYMMDD (YYYY is the 4 digit Christian year, MM is the month, DD is the day). For example, 1995/9/5 will be indicated 19950905. ŸTM: Time: Military time. The format is HHMMSS (HH is the hour, MM is the minute and SS is the second). ŸTS: Time Stamp. Combination of DT and TM. The format is; YYYYMMDDHHMMSS. ŸCM: Field which multiple data are combined by delimiter of the components.

(4) Message Header Record:

This Record occurs in the front of a message and indicates the goal of the message, such as origination and destination.

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	4	ST	○		Delimiter Definition
3					Message Control ID
4					Access Password
5	36	CM	○		Sender Name or ID
6					Sender Street Address
7					Reserved Field
8					Sender Telephone Number
9					Characteristics of Sender

10	30	ST	○		Receiver ID
11	11	CM	○		Comment or Special Instructions
12	1	NM	○		Processing ID
13	1	NM	○		Version No.
14					Date and Time of Message

Explanation of Each Field

1 Record Type ID — Use 'H'

2 Delimiter Definition — Defines Field delimiter, Repeat delimiter, Component delimiter, 4 Escape characters.
The first character defines the Field delimiter and also corresponds to the Field delimiter of the Record Type ID.
Four characters for this is: | ¥ ^ &

5 Sender Name or ID — Name of the machine transmitting this message.
When transmitting from an 7600,
the registered name of 7600 [7] ^ communication program version will be transmitted.

10 Receiver ID — Name of the machine receiving this message.
7600 transmission process Enter registered Host name [8].
7600 reception process Currently this Field is used by the receiving machine to confirm if the message is address to this machine or not; however, this is not done by the 7600. Therefore, the value of this Field stays in the Communication Log only.

11 Comment or Special Instructions — Comment regarding this message is entered here.
The first Component Element indicates purpose for the message.

- TSREQ: Test request inquiry
- RSUPL: Result report
- PCUPL: Photometry calibration report
- ICUPL: ISE calibration report
- ECUPL: Elecsys calibration report
- ABUPL: Absorbance report
- EFUPL: Elecsys Row Data report
- TSDWN: Registration of test request
- RSREQ: Inquiry for the result

The second Component Element indicates cause of the message.

- REAL: Message automatically generated by an 7600.
- BATCH: Message generated with an instruction by an operator from working terminal.
- REPLY: Response message for inquiry from a Host.

12 Processing ID — Indicates the processing method for the messages. Currently 'P' is always used.

13 Version No — Enter version number of the communication program. Currently '1' is always used.

[7]Name of the 7600 is registered on the Host Communication Parameter Setting Screen. Characters that can be used are either numbers or minus sign '-'.
[8]Name of the Host Computer is to have communications with is registered on the Host Communication Parameter Setting Screen. Characters that can be used are either numbers or minus sign '-'.

(b) New Mode

Same as the Current Mode.

(5) Patioent Information Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3					Practice Assigned Patient ID
4					Laboratory Assigned Patient ID
5					Patient ID No. 3
6					Patient Name
7					Mother's Maiden Name
8					Birth date
9					Patient Sex
10					Patient Race
11					Patient Address
12					Reserved Field
13					Patient Phone No
14					Attending Physician ID
15					Special Field 1

Explanation of Each Field

1 Record TypeID Use 'P'

2 Sequence Number Sequence number of the Patient Information Record in the message and it begins with 1.

(b) New Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3					Practice Assigned Patient ID
4					Laboratory Assigned Patient ID
5					Patient ID No. 3
6					Patient Name
7					Mother's Maiden Name
8					Birth date
9	1	ST	○		Patient Sex
10					Patient Race
11					Patient Address
12					Reserved Field
13					Patient Phone No
14					Attending Physician ID
15	5	CM	○		Special Field 1

Explanation of Each Field

1 Record TypeID Use 'P'

2 Sequence Number Sequence number of the Patient Information Record in the message and it begins with 1.

9 Patient Sex M: Male, F: Female, U: Unknown

15 Special Field 1 Age of the Patient

Format: <Age>^<Age Unit>

- For <Age> refer to Age of the Patient
- For <Age Unit> refer to Indicate unit of the age. 'Y' is the year, 'M' is the month, and 'D' is the day.

(6) Test Order Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	29 or 38	CM	○		Specimen ID
4	2	ST	○		Instrument Specimen ID
5	12	CM	○		Universal Test ID
6	1	ST	○		Priority
7					Requested/Ordered Date and Time
8	14	TS	○		Specimen Collection Date and Time
9					Collection End Time
10					Collection Volume
11					Collector ID
12	1	ST	○		Action Code
13					Danger Code
14	7	CM	○		Relevant Clinical Information
15					Date/Time Specimen Received
16	2	ST	○		Specimen Descriptor
17					Ordering Physician
18					Physician's Telephone Number
19	6	ST	○		User Field No.1
20	104	CM	○		Users Field No.2
21					Laboratory Field No.1
22					Laboratory Field No.2
23	14	TS	○		Date/Time Results Reported or Last Modified
24					Instrument Charge to Computer System
25					Instrument Section ID
26	1	ST	○		Report Types
27					Reserved Field
28					Location or Ward of Specimen Collection
29					Nosocomial Infection Flag
30					Specimen Service
31					Specimen Institution

Explanation of Each Field

1 Record Type ID — Use 'O'

2 Sequence Number — Sequence number of the Patient Information Record in the message and it begins with 1.

3 Specimen ID — Identification procedure for samples by the 7600.
Format:<Sample>^<Sample ID>^<Sample Type>^<Rack ID>^<Position No>

Element	Max. Length	Form	Description
<Sample No>	5	NM	Confirmation Number when samples are numbered in sequence in order of input. In case of QC material, "Control Number * 1000+

			Sequence No. sample" is used. ex. Control No. = 1, Sequence No. = 2 is written as 1002
<Sample ID>	13	ST	Barcode attached on the test tube. Read by Barcode Reader in the 7600. In case of QC, this field means the name of the Control or Lot number. Total valid character number is 13 or 22. If total digits is less than max length, the left side empty digit must be filled with space in the routine and STAT sample. In the other sample, the right empty digit must be filled with space of the field. ex. ID =123456 is written as " 123456"
<Sample Type>	1	NM	Type of sample. Sample type is identified by numbers 1 ~ 5.
<Rack ID>	5	ST	ID of the Sample Rack with 5 samples. Two ways of readings are; reading from the opening in the Rack or Barcode on the side of the rack.
<Position No>	1	NM	Values 1 ~ 5, counting from the Rack's forward direction; the position of the first sample is 1 and the last sample is 5.

4 Instrument Specimen ID

R1: Indicates the first analysis request for the routine sample.
R2: Indicates rerunning analysis request for the routine sample.
Q: Control sample

5 Universal Test ID

Specifies test request. This format is used repeatedly with delimiters when ordering several tests. Maximum of 160 tests can be specified. If this field is used for test selection, Maximum of 100 tests can be specified.

Format ^^^<Application Code>/<Dilution>

<Application Code>:Type-NM, Maximum Length (Byte)-5

The test with 3-digit numbers. Input values 1 to 1910.

If the application code for HOST is set, Input values 1 to 99999.

< Dilution >:Type-ST or NM, Maximum Length (Byte)-3

When the test code is selected, 7600 measures following below.

(1) not specified: Photometic and ISE testing is done using the standard sample volume. Elecsys testing is done using the first dilution ratio.
(2) 'clr': Caceling is done. Test Selection which is input from UI is valid.
(3) 'Inc': It can be specified the increased sample volume for photometric test.
(4) 'Dec': It can be specified the decreased sample volume for photometric test and the ISE test using URINE(sample type=2). Elecsys test is measured with rerun dilution ratio.
(5) "Dilution ratio": when measuring the elcsys test, it can be specified dilution ratio('1','2','5','10','20','50','100','400').

		When the result is transmitted, 7600 measures following below. If the elcsys test is specified, 7600 transmit the dilution ratio of the analysis(1 to 400). If the photometric and ISE test is specified, 7600 transmit 'dec','inc' or not specified.
6	Priority	Indicates the priority order of the Patient Samples. Not used for Control Samples. Values are one of the following. S: Indicates STAT analysis of the Patient Samples. R: Indicates Routine analysis of the Patient Samples.
8	Specimen Collection Date and Time	**Date and time specimens were collected is designated by YYYYMMDDHHMMSS.**
12	Action Code	Indicates type of information for the report. N: Indicates request for the test item./ Indicates report for the routine sample's analytical data. Q: Indicates report for the control sample's analytical data.
14	Relevant Clinical Information	**Format<Age>^<Age Unit>^<Sex>** • For <Age> refer to Age of the Patient • For <Age Unit> refer to Indicate unit of the age. 'Y' is the year, 'M' is the month, and 'D' is the day. • For <Sex> refer to Indicates sex. M for male and F for female.
16	Specimen Descriptor	This field indicates the type of sample container on the rack. When there is no value, it will be read as Hitachi Standard Cup. When specifying the value, it will be one of the following. SC: Indicates Hitachi Standard Cup MC: Indicates Micro Cup
19	User Field No.1	Identifies the operator who performed the analysis with Operator ID. The Operator ID must be an ID registered in the 7600. This field is not specified by a Host.
20	Users Field No.2	Format<Comment1>^<Comment2>^<Comment3>^Comment4>^<Comment5>"5 types of comments regarding the sample can be specified. These comments can be read or edited through GUI of the 7600. <Comment 1>:Type-ST, Maximum Length (Byte)-30 <Comment 2>:Type-ST, Maximum Length (Byte)-25 <Comment 3>:Type-ST, Maximum Length (Byte)-20 <Comment 4>:Type-ST, Maximum Length (Byte)-15 <Comment 5>:Type-ST, Maximum Length (Byte)-10 In case of 7600 to HOST, each comment is fixed length string. If length of comment is less than specified number, in right end of string, adequate number of "SPACE"s must be added. ex. <Comment 5> "ABCDEF" is send as "ABCDEF " from 7600.
23	Date/Time Results Reported or Last Modified	Indicates the date and time the result was obtained. This field will not be specified by a Host.
26	Report Types	Indicates type of communications. O: Indicates request for the test item.(Transmitted by the Host) F: Indicates report for the analytical data.(Transmitted by the 7600)

(b) New Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	29 or 38	CM	○		Specimen ID
4	2	ST	○		Instrument Specimen ID
5	12	CM	○		Universal Test ID

6	1	ST	○		Priority
7					Requested/Ordered Date and Time
8	14	TS	○		Specimen Collection Date and Time
9					Collection End Time
10					Collection Volume
11					Collector ID
12	1	ST	○		Action Code
13					Danger Code
14	7	CM	○		Relevant Clinical Information
15					Date/Time Specimen Received
16	2	ST	○		Specimen Descriptor
17					Ordering Physician
18					Physician's Telephone Number
19					User Field No.1
20					Users Field No.2
21					Laboratory Field No.1
22					Laboratory Field No.2
23	14	TS	○		Date/Time Results Reported or Last Modified
24					Instrument Charge to Computer System
25					Instrument Section ID
26	1	ST	○		Report Types
27					Reserved Field
28					Location or Ward of Specimen Collection
29					Nosocomial Infection Flag
30					Specimen Service
31					Specimen Institution

Explanation of Each Field

1 Record Type ID — Use 'O'

2 Sequence Number — Sequence number of the Patient Information Record in the message and it begins with 1.

3 Specimen ID — Identification procedure for samples by the 7600.
Refer to Item(6) Specimen ID(a) 3

4 Instrument Specimen ID — Format:<Sample No>^<Rack ID>^< Position No>^^<Rack Type>^<Container Type>

<Sample No>:Type-NM, Maximum Length (Byte)-5
Confirmation Number when samples are numbered in sequence in order of input. In case of QC material, "Control Number * 1000+ Sequence No. sample" is used.
< Rack ID>:Type-ST, Maximum Length (Byte)-5
ID of the Sample Rack with 5 samples.
< Position No>:Type-NM, Maximum Length (Byte)-1
Values 1 ~ 5, counting from the Rack's forward direction; the position of the first sample is 1 and the last sample is 5.
< Rack Type>:Type-ST, Maximum Length (Byte)-2
S1: rack type 1 for routine and STAT sample (Blood serum)
S2: rack type 1 for routine and STAT sample (Urine)
S3: rack type 1 for routine and STAT sample (CSF)
S4: rack type 1 for routine and STAT sample (Suprnt)
S5: rack type 1 for routine and STAT sample (Others)
QC: Control
< Container Type>:Type-ST, Maximum Length (Byte)-2
This field indicates the type of sample container on the rack. When there is no value, it will be read as Hitachi Standard Cup. When specifying the value, it will be one of the following.
SC: Indicates Hitachi Standard Cup
MC: Indicates Micro Cup

5	Universal Test ID	Specifies test request. This format is used repeatedly with delimiters when ordering several tests. Maximum of 160 tests can be specified. If this field is used for test selection, Maximum of 100 tests can be specified. Format ^^^<Application Code>/<Dilution> <Application Code>:Type-NM, Maximum Length (Byte)-5 The test with 3-digit numbers. Input values 1 to 1910. If the application code for HOST is set, Input values 1 to 99999. < Dilution >:Type-ST or NM, Maximum Length (Byte)-3 Refer to Item(6) Universal Test ID (a) 5
6	Priority	Indicates the priority order of the Patient Samples. Not used for Control Samples. Values are one of the following. S: Indicates STAT analysis of the Patient Samples. R: Indicates Routine analysis of the Patient Samples.
8	Specimen Collection Date and Time	DATE AND TIME SPECIMENS WERE COLLECTED IS DESIGNATED BY YYYYMMDDHHMMSS.
12	Action Code	Indicates type of information for the report. N: Indicates report for the routine sample's analytical data. Q: Indicates report for the control sample's analytical data. A:Indicates request for the test item.from HOST C:Indicate cancel for the test item from HOST It means the cancel of the test item which is set for Universal Test ID.
16	Specimen Descriptor	The type of the sample (1～5)
23	Date/Time Results Reported or Last Modified	Indicates the date and time the result was obtained. This field will not be specified by a Host.
26	Report Types	Indicates type of communications. O: Indicates request for the test item.(Transmitted by the Host) F: Indicates report for the analytical data.(Transmitted by the 7600)

(7) Result Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	24	CM	○		Universal Test ID
4	15	CM	○		Data or Measurement Value
5	6	ST	○		Units
6			○		Reference Ranges
7	2	ST	○		Result Abnormal Flags
8					Nature of Abnormality Testing
9	1	ST	○		Result Status
10					Date of Change in Instrument Normative values Units
11					Operator Identification
12					Data/Time Test Started
13					Date/Time Test Completed
14	4	ST	○		Instrument Identification

Explanation of Each Field

1	Record Type ID	Use 'R'
2	Sequence Number	Indicates sequence numbers for the Test Request Record in the current layer. Since this record is the layer that follows the Test Request Record, it will reset to 1 for each occurrence of a new Test

		Request Record; It will be numbered consecutively; 1, 2, etc. for each occurrence this record.
3	Universal Test ID	Same as Test Request Record's Universal Test ID.
4	Data or Measurement Value	Results of the measurement **In case of photometric/ISE/serum index/Calculated test** [Quantitative] <measurement value> [Qualitative] < qualitative value>^<measurement value> or < qualitative value> If an option of "Send concentration of chemistry qualitative test" is selected on the Host communication setting screen, the first rule is applied. <measurement value>:Type-NM, Maximum Length (Byte)-:6 6-digit measurement value or 6 spaces if no result < qualitative value>: Type-NM, Maximum Length (Byte)-6 -2, -1, 0, 1, 2, 3 or 6 spaces if no result **In case of Elecsys test** [Quantitative] <measurement value> [Qualitative] < qualitative value>^<cut off index> <measurement value>:Type-NM, Maximum Length (Byte)-7 7-digit measurement value or 7 spaces if no result < qualitative value>: Type-NM, Maximum Length (Byte)-7 7 spaces if no result, qualitative value is below. 1 (positive)/0 (border line)/-1 (negative) < cut off index>: Type-NM, Maximum Length (Byte)-7 7 spaces if no result
5	Units	Indicates units of the Analytical Data.
7	Result Abnormal Flags	L: Lower value than normal H: Higher value than normal LL: Lower than Panic Low Value HH: Higher than Panic High Value N: Normal A: Abnormal
9	Result Status	Indicates number of test conducted for the Analytical data. F: Indicates Analytical Data from the first test C: Indicates Analytical Data from rerun
14	Instrument Identification	Indicates the Module ID of the module that performed the analysis. P: P Module Analyzer D: D Module Analyzer

ISE: ISE Module analyzer
E: Elecsys Module Analyzer
For Photometric Modules (P and D) will be numbered 1, 2, ...6 from the Loader side.
For the ISE module, it will be numbered either 1 or 2.
For the E module, it will be numbered 11,12…61,62
Example: D1,D2,D3,P4,P5, ISE2,E11

(b) New Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	24	CM	○		Universal Test ID
4	15	CM	○		Data or Measurement Value
5	6	ST	○		Units
6					Reference Ranges
7	2	ST	○		Result Abnormal Flags
8					Nature of Abnormality Testing
9	1	ST	○		Result Status
10					Date of Change in Instrument Normative values Units
11	6	ST	○		Operator Identification
12					Data/Time Test Started
13					Date/Time Test Completed
14	4	ST	○		Instrument Identification

Explanation of Each Field

1 Record Type ID — Use 'R'

2 Sequence Number

Indicates sequence numbers for the Test Request Record in the current layer. Since this record is the layer that follows the Test Request Record, it will reset to 1 for each occurrence of a new Test Request Record; It will be numbered consecutively; 1, 2, etc. for each occurrence this record.

3 Universal Test ID — Same as Test Request Record's Universal Test ID.

4 Data or Measurement Value — Results of the measurement

In case of photometric/ISE/serum index/Calculated test
[Quantitative]
<measurement value>

[Qualitative]
< qualitative value>^<measurement value> or < qualitative value>

If an option of "Send concentration of chemistry qualitative test" is selected on the Host communication setting screen, the first rule is applied.

<measurement value>: Type-NM, Maximum Length (Byte)-6
6-digit measurement value or 6 spaces if no result
< qualitative value>: Type-NM, Maximum Length (Byte)-6
-2, -1, 0, 1, 2, 3 or 6 spaces if no result

In case of Elecsys test

[Quantitative]
<measurement value>

[Qualitative]
< qualitative value>^<cut off index>

<measurement value>:Type-NM, Maximum Length (Byte)-:7
7-digit measurement value or 7 spaces if no result

< qualitative value>: Type-NM, Maximum Length (Byte)-7
7 spaces if no result, qualitative value is below.
1 (positive)/0 (border line)/-1 (negative)

< cut off index>: Type-NM, Maximum Length (Byte)-7
7 spaces if no result

5	Units	Refer to Item(7)Result Record(a)5
7	Result Abnormal Flags	Refer to Item(7)Result Record(a)7
9	Result Status	Refer to Item(7)Result Record(a)9
11	Operator Identification	Identifies the operator who performed the analysis with Operator ID. The Operator ID must be an ID registered in the 7600. This field is not specified by a Host.
14	Instrument Identification	Refer to Item(7)Result Record(a)14

(8) Comment Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English Name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	1	ST	○		Comment Source
4	104	CM	○		Comment Text
5	1	ST	○		Comment Type

Explanation of Each Field

1	Record Type ID	Use 'C'
2	Sequence Number	Indicates sequence number of the Test Request Record in the current layer. Since this record is in the layer following the Test Request Record, it will be reset to 1 each time a new Test Request Record is presented and each time this Record is called-up it will be numbered consecutively, 1, 2, etc.
3	Comment Source	Indicated the source of the Comment. Currently issued only from the 7600, therefore, 'I' is always used.
4	Comment Text	Data Flag number for the results confirmed by the 7600 is stored.
5	Comment Type	Character limiting the comment format is stored. Currently issued only from the 7600, therefore, 'I' is always used.

(b) New Mode

Same as the Current Mode.

(9) Request Information Record:

(a) Current Mode

Used to request information between a Host and a 7600.

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	36 or 45	CM	○		Starting Range ID Number
4					Ending Range ID Number
5					Universal Test ID
6					Nature of Request Time Limits
7					Beginning Request Results Date and Time
8					Ending Request Results Date and Time
9					Requesting Physician Name
10					Requesting Physician Telephone Number
11					User Field No. 1
12					User Field No. 2
13	1	ST	○		Request Information Status Codes

Explanations of Each Field

1 Record Type ID — Use 'Q'

2 Sequence Number — Indicates sequence numbers for the Test Request Record in the current layer. Since this record is the layer that follows the Test Request Record, it will reset to 1 each time a new Test Request Record is presented and each time this record is called-up it will be numbered consecutively; 1, 2, etc.

3 Starting Range ID Number

Format :^^<Sample No>/<Sample ID>/<Sample Type>/<Rack ID>/<Position No>/<Kind>/<Priority>

- For <Sample No>/<Sample ID>/Sample Type>/<Rack ID>/<Position No> refer to Specimen ID Field for Test Order Record.
- For <Kind>, refer to Instrument Specimen ID of the Test Order Record.
- For <Priority>, refer to Priority of the Test Order Record.
- If Sample ID of barcode contains the character "/":(ASCII 0x2f) in ID mode (Code39, NW7, Code128), this "/" is same as preserved component delimiter in this field.. Only in this field, "/" is replaced with "&X2F&". Valid character length of "&X2F&" is only counted as 1. "/" is not used at the New Mode and if "&X2F&" is used at the New Mode, it causes the communication error(126-24)

13 Request Information Status Codes — The purpose of this record.
O: Request for Test Request only (no results). Inquiry will be sent to a Host from an 7600 using this code.
A: Rejects the previous request and accepts the new request. Information that can be request through the Request Record is one at a time. To request the next information during a request of another, it is necessary to reject the previous request with this code.
F: The final result

(b) New Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	36 or 45	CM	○		Starting Range ID Number
4					Ending Range ID Number
5	3	ST	○		Universal Test ID
6					Nature of Request Time Limits
7					Beginning Request Results Date and Time
8					Ending Request Results Date and Time
9					Requesting Physician Name
10					Requesting Physician Telephone Number
11					User Field No. 1
12					User Field No. 2
13	1	ST	○		Request Information Status Codes

Explanations of Each Field

1	Record Type ID	Use 'Q'
2	Sequence Number	Indicates sequence numbers for the Test Request Record in the current layer. Since this record is the layer that follows the Test Request Record, it will reset to 1 each time a new Test Request Record is presented and each time this record is called-up it will be numbered consecutively; 1, 2, etc.
3	Starting Range ID Number	Refer to Starting Range ID Number(a)3 of the Request Information Record
5	Universal Test ID	Use 'ALL'
13	Request Information Status Codes	The purpose of this record. O: Request for Test Request only (no results). Inquiry will be sent to a Host from an 7600 using this code. A: Rejects the previous request and accepts the new request. Information that can be request through the Request Record is one at a time. To request the next information during a request of another, it is necessary to reject the previous request with this code. F: The final result

(10) Message Termination Record:

(a) Current Mode

This record occurs at the end of a message to indicate the end of a message.

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number

3	1	ST	○		Termination Code

Explanation of Each Field

1 Record Type ID Use 'L'

2 Sequence Number Always '1'

3 Termination Code Input the value shown below.

Field Value	Explanation
N	Normal termination
T	Forced termination of the transmitting side
R	Forced termination of the receiving side
E	System error
Q	Request error for the last reception (request is rejected)
I	No information that corresponds to the inquiry in the last reception
F	The last request was processed.

(b) New Mode

Same as the Current Mode.

(11) Photometric Raw data(Absorbance) Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	3	ST	○		Record Type Sub ID
4	2	ST	○		Module ID
5	3	NM	○		Cell No
6	1	NM	○		Imput Information
7	2	NM	○		Reaction Time
8	2	NM	○		Number of Points
9	6	NM	○		Cell Blank Data
10	6	NM	○		Delta ABS Data

Explanations of Each Field

1 Record Type ID — Use 'M'

2 Sequence Number — **This record appears as the next layer of the Message Header Record. The Field value is 1 for one Record and to specify several Records number in sequence starting from 1 will be assigned.**

3 Record Type Sub ID — Use 'ABS'

4 Module ID — ID of the Analysis Module the test belongs to. The first character of the module that performed the analysis + input side in order (example, P1,P2,D3,D4....).

5 Cell No — Number of the Reaction Cell. Input value 1 to 240.

6 Imput Information — Internal/External information. Input the following values. No input in this field when there is no distinction of internal or external.
I: Internal Reaction Cell line
O: External Reaction Cell line

7 Reaction Time — Reaction time (Unit: minutes). Input values 1 to 22.

8 Number of Points — Reaction point number. Input values 1 to 73.

9 Cell Blank Data — Cell blank absorbance. Difference between the main wave length and sub-wave length absorbance data [(main wave length absorbance data) - (sub-wave length absorbance data)] can be repeat up to 4 points.

10 Delta ABS Data — The difference between the main wave length and the sub-wave length absorbance data [(main wave length absorbance data) - (sub-wave length absorbance data)] repeated up to the value indicated by Point Num.

(b) New Mode

Same as the Current Mode.

(12) Elecsys Raw data(effective signal) Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	3	ST	○		Record Type Sub ID
4	8	NM	○		Raw data
5	8	NM	○		Effective signal

Explanations of Each Field

1 Record Type ID — Use 'M'

2 Sequence Number — This record appears as the next layer of the Message Header Record. The Field value is 1 for one Record and to specify several Records number in sequence starting from 1 will be assigned.

3 Record Type Sub ID — Use 'EFS'

4 Raw data — This field value is Elecsys raw data. It repeats 200 times.

5 Effective signal — This field value is effective signal.

(b) New Mode

Same as the Current Mode.

(13) Photometric Calibration Result Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	3	ST	○		Record Type Sub ID
4	6	ST	○		Operator ID
5	8	CM	○		Test Code
6	2	ST	○		Module ID
7	3	NM	○		Calibration Alarm
8	6	NM	○		SD Data Field
9	38	CM	○	○	STD Data

Explanations of Each Field

1 Record Type ID — Use 'M'

2 Sequence Number — This Record will appear as the next layer of the Message Header Record. For one Record, the Field value is 1; for specifying several, sequence numbers starting from 1 will be assigned.

3 Record Type Sub — Use 'PCR'

	ID	
4	Operator ID	ID of the operator who performed the calibration at the 7600 will be transmitted.
5	Test Code	Format <AppCode>
6	Module ID	ID of the Analytical Module belonging to the test. Numbered in order from the first character of the Module that performed the analysis + Number from Loader side (example: P1, P2, D3, D4...).
7	Calibration Alarm	Calibration alarm.
8	SD Data Field	SD value data.
9	STD Data	Repeated from STD1 to STD6 for as many as there are. Format<Absorbance Data for the first time>^<First time for the first one or the final absorbance data>^<Absorbance Data of the second time>^<Second time for the first one or the final absorbance data>^<Data Alarm>^<Prozone Value> Detail specification is shown in below; < Absorbance Data for the first time >:Type-NM, Maximum Length (Byte)-6 < First time for the first one or the final absorbance data >:Type-NM, Maximum Length (Byte)-6 < Absorbance Data of the second time >:Type-NM, Maximum Length (Byte)-6 < Second time for the first one or the final absorbance data >:Type-NM, Maximum Length (Byte)-6 < Data Alarm >:Type-NM, Maximum Length (Byte)-3 < Prozone Value >:Type-NM, Maximum Length (Byte)-6

(b) New Mode

Same as the Current Mode.

(14) ISE Calibration Result Record:

(a) Current Mode

Sends ISE Calibration Result

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	3	ST	○		Record Type Sub ID
4	6	ST	○		Operator ID
5	4	ST	○		Module ID
6	3	NM	○		Na calibration Alarm
7	3	NM	○		K calibration Alarm
8	3	NM	○		Cl calibration Alarm
9	31	CM	○		Na data Alarm
10	31	CM	○		K data Alarm
11	31	CM	○		Cl data Alarm
12	55	CM	○		Na data
13	55	CM	○		K data

14	55	CM	○		Cl data

Explanation of Each Field

1 Record Type ID — Use 'M'

2 Sequence Number — This Record will appear as the next layer of the Message Header Record. The Field value will be 1 for one Record and to specify several records, sequence number starting from 1 will be assigned.

3 Record Type Sub ID — Use 'ICR'

4 Operator ID — ID of the operator that performed the calibration at the Analysis will be transmitted.

5 Module ID — ID of the Analytical Module that the test belongs to. Either ISE1 or ISE2 will be transmitted.

6 Na calibration Alarm — Na test calibration alarm.

7 K calibration Alarm — K test calibration alarm.

8 Cl calibration Alarm — Cl test calibration alarm.

9 Na data Alarm — Na test data alarm.
Format <Internal standard solution electromotive force data alarm>^<Low solution electromotive force data alarm>^<High solution electromotive force data alarm>^<Calibrator solution electromotive force data alarm>^"<Slope for display data alarm>^<Internal standard solution concentration data alarm>^<Calibrator solution concentration data alarm>^<Numbers for compensation data alarm> Detail specification is shown in below;

Element	Max. Length	Type
<Internal standard solution electromotive force data alarm>	3	NM
<Low solution electromotive force data alarm>	3	NM
<High solution electromotive force data alarm>	3	NM
<Calibrator solution electromotive force data alarm>	3	NM
"<Slope for display data alarm>	3	NM
<Internal standard solution concentration data alarm>	3	NM
<Calibrator solution concentration data alarm>	3	NM
<Numbers for compensation data alarm>	3	NM

10 K data Alarm — K test data alarm. Refer to Na data Alarm.

11 Cl data Alarm — CI test data alarm.

12 Na data — Na test calibration analytical data. (All Elements: Max Length = 6, Type =NM)
Format <Internal standard solution electromotive force data>^<Low solution electromotive force data>^<High solution electromotive force data>^<Calibrator solution electromotive force data>^<Slope for display data>^<Internal standard solution concentration data>^<Calibrator solution concentration data>^<Numbers for compensations data>

13 K data — K test calibration analytical data. Refer to Na data.

14 Cl data — Cl test calibration analytical data. Refer to Na data.

(b) New Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)

1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	3	ST	○		Record Type Sub ID
4	6	ST	○		Operator ID
5	4	ST	○		Module ID
6	3	NM	○		Na calibration Alarm
7	3	NM	○		K calibration Alarm
8	3	NM	○		Cl calibration Alarm
9	31	CM	○		Na data Alarm
10	31	CM	○		K data Alarm
11	31	CM	○		Cl data Alarm
12	55	CM	○		Na data
13	55	CM	○		K data
14	55	CM	○		Cl data

Explanation of Each Field

1 Record Type ID — Use 'M'

2 Sequence Number — This Record will appear as the next layer of the Message Header Record. The Field value will be 1 for one Record and to specify several records, sequence number starting from 1 will be assigned.

3 Record Type Sub ID — Use 'ICR'

4 Operator ID — ID of the operator that performed the calibration at the Analysis will be transmitted.

5 Module ID — ID of the Analytical Module that the test belongs to. Either ISE10 or ISE20 will be transmitted.

6 Na calibration Alarm — Na test calibration alarm.

7 K calibration Alarm — K test calibration alarm.

8 Cl calibration Alarm — Cl test calibration alarm.

9 Na data Alarm — Na test data alarm.

Format <Internal standard solution electromotive force data alarm>^<Low solution electromotive force data alarm>^<High solution electromotive force data alarm>^<Calibrator solution electromotive force data alarm>^"<Slope for display data alarm>^<Internal standard solution concentration data alarm>^<Calibrator solution concentration data alarm>^<Numbers for compensation data alarm> Detail specification is shown in below;

Element	Max. Length	Type
<Internal standard solution electromotive force data alarm>	3	NM
<Low solution electromotive force data alarm>	3	NM
<High solution electromotive force data alarm>	3	NM
<Calibrator solution electromotive force data alarm>	3	NM
"<Slope for display data alarm>	3	NM
<Internal standard solution concentration data alarm>	3	NM
<Calibrator solution concentration data alarm>	3	NM
<Numbers for compensation data alarm>	3	NM

10 K data Alarm K test data alarm. Refer to Na data Alarm.
11 Cl data Alarm Cl test data alarm.
12 Na data Na test calibration analytical data. (All Elements: Max Length = 6, Type =NM)
Format
<Internal standard solution electromotive force data>^<Low solution electromotive force data>^<High solution electromotive force data>^<Calibrator solution electromotive force data>^<Slope for display data>^<Internal standard solution concentration data>^<Calibrator solution concentration data>^<Numbers for compensations data>
13 K data K test calibration analytical data. Refer to Na data.
14 Cl data Cl test calibration analytical data. Refer to Na data.

(15) Elecsys Calibration Result Record:

(a) Current Mode

Order	Maximum Length	Type	Valid	Repeat	Field Name (English name specified by ASTM)
1	1	ST	○		Record Type ID
2	6	NM	○		Sequence Number
3	3	ST	○		Record Type Sub ID
4	6	ST	○		Operator ID
5	8	CM	○		Test Code
6	8	ST	○		Calibration Method
7	3	ST	○		Module ID
8	8	NM	○		Rack pack lot number
9	6	NM	○		Rack pack number
10	1	NM	○		Expierd Rack pack Flag
11	8	NM	○		Calibration lot number
12	1	ST	○		Result Status
13	96	CM	○	○	Result characteristics
14	179	CM	○	○	Calibrators signals
15	44	CM	○		Target value
16	6	ST	○		Unit
17	8	NM	○		Cut off
18	9	CM	○		Border line area
19	14	TS	○		Measurement Data

Explanation of Each Field

1 Record Type ID Use ‘M’
2 Sequence Number This Record will appear as the next layer of the Message Header Record. The Field value will be 1 for one Record and to specify several records, sequence number starting from 1 will be assigned.
3 Record Type Sub ID Use ‘ECR’
4 Operator ID ID of the operator that performed the calibration at the Analysis will be transmitted.
5 Test Code Test code number for the calibration.
Format ^^^<Application Code>/<Dilution>

<Application Code>:Type-NM, Maximum Length (Byte)-5
Input values 1001 to 1910. If the application code for HOST is set, Input values 1 to 99999.
6 Calibration Method This field means the calibration method.

		'LOT': LOT Calibration is successful. 'RackPack': All cases except 'LOT'. If LOT Calibration is done, but Calibration result is failed.
7	Module ID	Refer to Instrument Identification (a)14 of the Result Record
8	Rack pack lot number	Rack pack lot number. Input values 1 to 99999999.
9	Rack pack number	Rack pack number. Input values 1 to 199999.
10	Expired Rack pack Flag	0: Not expired rack pack 1: Expired rack pack
11	Calibration lot number	Calibration lot number. Input values 1 to 99999999.
12	Result Status	O: OK Q: Question F: Failed
13	Result characteristics	Format<Characteristic ID>^<Criteria result>^<Detail>¥… Detail specification is shown in below (i).
14	Calibrators signals	Format is shown in below (ii).
15	Target value	This field is used for quantitative test only. The value is Null for qualitative test. Format<Level1>^<Level2>^<Level3>^<Level4>^<Level5> < Level1>:Type-NM, Maximum Length (Byte)-8
16	Unit	Indicates units of the Analysis.
17	Cut off	Cut of Index. This field is used for qualitative test only. The value is Null for quantitative test.
18	Border line area	This field is used for qualitative test only. The value is Null for quantitative test. Format<Lower limit>^<Upper limit> < Lower limit >:Type-NM, Maximum Length (Byte)-8 < Upper limit >:Type-NM, Maximum Length (Byte)-8
19	Measurement Data	Indicates the date and time the result was obtained. YYYYMMDDHHMMSS

(i) Result characteristics Criteria result

[For Quantitative tests]

Criteria	**Characteristic ID**	**Criteria result**	**Detail**
Missing Values	I	O:OK Q:Questionable F:Failed	*1-1
Monotony of curve	M	O:OK F:Failed	*1-2
Minimum signal	S	O:OK Q:Questionable F:Failed	*1-1
Calibration factor	R	Value of Calibration factor	[NONE]
Deviation of dupl.measurement	D	O:OK Q:Questionable F:Failed	*1-2
Minimum acceptable difference	F	O:OK F:Failed	[NONE]
System Error	Y	O:OK Q:Questionable	*1-2

[For Qualitative tests]

Criteria	Characteristic ID	Criteria result	Detail
Missing Values	I	O:OK Q:Questionable F:Failed	*1-3
Deviation of dupl.measurement	D	O:OK Q:Questionable F:Failed	*1-4
Slope	L	O:OK F:Failed	[NONE]
Min/Max signal	B	O:OK Q:Questionable F:Failed	*1-5
Minimum acceptable difference	F	O:OK F:Failed	[NONE]
System Error	Y	O:OK Q:Questionable	*1-4

***1-1 : Flag string with 20 positions:**
Format: <Level1 1st><Level1 2nd><Level1 3rd><Level1 4th>.....<Level5 1st><Level5 2nd><Level5 3rd><Level5 4th>

each flag can be '-' (= ok) or <level no.> (= not ok)

example: 11------33----------

meaning:

Level	1st	2nd	3rd	4th
1	not ok	not ok	ok	ok
2	ok	ok	ok	ok
3	not ok	not ok	ok	ok
4	ok	ok	ok	ok
5	ok	ok	ok	ok

***1-2 : Flag string with 5 positions:**
Format: <Level 1><Level 2><Level3><Level4><Level5>

each flag can be '-' (= ok) or <level no.> (= not ok)

example 1-34-

meaning:

Level	
1	not ok
2	ok
3	not ok
4	not ok
5	ok

***1-3 : Flag string with 8 positions:**
Format: <Level1 1st><Level1 2nd><Level1 3rd><Level1 4th><Level2 1st><Level2 2nd><Level2 3rd><Level2 4th>

each flag can be '-' (= ok) or <level no.> (= not ok)

example: 1---22--

meaning:

Level	1st	2nd	3rd	4th
1	not ok	ok	ok	ok
2	not ok	not ok	ok	ok

***1-4 : Flag string with 2 positions:**
Format: <Level 1><Level 2>

each flag can be '-' (= ok) or <level no.> (= not ok)

example: 1-

meaning:

Level	
1	not ok
2	ok

***1-5 : Flag string with 8 positions:**
Format: <Level1 1st><Level1 2nd><Level1 3rd><Level1 4th><Level2 1st><Level2 2nd><Level2 3rd><Level2 4th>

each flag can be '-' (= ok), '>' (= signal > Max signal) or '<' (= signal < Min signal)

example: >-<->-<-

meaning:

Level	1st	2nd	3rd	4th
1	>max	ok	<min	ok
2	>max	ok	<min	ok

(ii) Calibrators signals
Format:
<Level1 1st signal>^<Level1 2nd signal>^<Level1 3rd signal>^<Level1 4th signal>¥
<Level2 1st signal>^<Level2 2nd signal>^<Level2 3rd signal>^<Level2 4th signal>¥
.....
<Level5 1st signal>^<Level5 2nd signal>^<Level5 3rd signal>^<Level5 4th signal>

(b) New mode
Same as the Current Mode.

(16) Messages Transmitted by the 7600
Messages transmitted by the 7600s (messages received by the Hosts) are indicated in the table below.

Messages	Reasons
Inquiry for the Requested Tests	• Inquiry is made for the requested test just before loading the sample rack (passing through the ID reader).
Result Report	• Reports on the result at the point when the results for the sample has been accumulated. • Reports on the result as a response for the inquiry from a Host. • Transmits results of the optional sample by instruction from a GUI of 7600.
Photometry Calibration Result Report	• Reports at the point when the Photometry calibration results are output.
ISE Calibration Result Report	• Reports at the point when the ISE calibration result is output.
Elecsys Calibration Result Report	• Reports at the point when the Elecsys calibration results are output.
Absorbance Report	• Reports absorbance of the optional sample data by

	instruction from an operation terminal
Elecsys Raw Data Report	• Reports Elecsys raw data of the optional sample data by instruction from an operation terminal

In any case, identifier will be set in the Comment or Special Instruction Field in the Message Header Record of the reason for the messages.

The following is the syntax of the messages.

Current Mode

Messages	Syntax	Comment or Special Instructions
Inquiry for the Requested Tests	H P Q L	TSREQ^REAL
Result Report	H P O $\{R C\}_n$ L n = 0~160	RSUPL^REAL RSUPL^BATCH RSUPL^REPLY
Photometry Calibration Result Report	H M-PCR L	**PCUPL^REAL**
ISE Calibration Result Report	H M-ICR L	ICUPL^REAL
Elecsys Calibration Result Report	H M-ECR L	ECUPL^REAL
Absorbance Report	H P O R C-RES M-ABS L	**ABUPL^BATCH**
Elecsys Raw Data Report	H P O R C-RES M-ABS L	EBUPL^BATCH

New Mode

Messages	Syntax	Comment or Special Instructions
Inquiry for the Requested Tests	H P Q L	TSREQ^REAL
Result Report	H P O C-CMM$\{R C-RES\}_n$ L n = 0~160	RSUPL^REAL RSUPL^BATCH RSUPL^REPLY
Photometry Calibration Result Report	H M-PCR L	PCUPL^REAL
ISE Calibration Result Report	H M-ICR L	ICUPL^REAL
Elecsys Calibration Result Report	H M-ECR L	ECUPL^REAL
Absorbance Report	H P O C-CMM R C-RES M-ABS L	ABUPL^BATCH
Elecsys Raw Data Report	H P O C-CMM R C-RES M-ABS L	EBUPL^BATCH

(17) Messages Transmitted by the Host

Messages transmitted by the Hosts are shown in the table below (messages received by the 7600).

Messages	Reasons
Order for Test Request	Orders test request for a sample.
Inquiry of Result	Makes inquiry for the result of a test.

The following is the syntax of the messages.

Current Mode

Messages	Syntax	Comment of Special Instructions
Order for Test Request	H P O • L	TSDWN ^ REPLY TSDWN ^ BATCH
Inquiry for Result	H Q L	RSREQ ^ REAL

New Mode

Messages	Syntax	Comment of Special Instructions
Order for Test Request	H P O C-CMM • L	TSDWN ^ REPLY TSDWN ^ BATCH
Inquiry for Result	H Q L	RSREQ ^ REAL

(18) Communication Error Processing at the ASTM Upper Layer

Alarm is shown in [ALARM] screen in GUI with following code.

Upper Layer Error Code Table

LEVEL: STOP

Alarm Code		Descriptions
Major	Minor	
126	21	No valid Record
	22	First Record is not a Header Record
	23	Undefined Record
	24	Data other than specified
340	1	A field delimiter of L record is insufficient.
	2	There is no record end of L record.
	3	Termination Code of L record is invalid.
	4	There is no record end of P record.
	5	A field delimiter of P record is insufficient.
	6	Sequence Number of P record is invalid.
	10	Instrument Specimen ID is invalid.
	12	Priority is invalid.
	14	Action Code is invalid.
	18	There is no record end of O record.
	19	Report Type is invalid.
	20	A field delimiter of Q record is insufficient.
	21	Sequence Number of Q record is invalid.
	22	Starting Range ID Number is invalid.
	23	There is no record end of Q record.
	24	Request Information Status Code is invalid.
	25	Specimen ID is invalid.
	26	Sample No. is invalid.
	28	Sample Type is invalid.

30	Rack Position No. is invalid.
31	A component delimiter of Universal Test ID is insufficient.
32	Action Code & Value is invalid.
33	A component delimiter of User Field No. 2 is insufficient.
34	Instrument Specimen ID is invalid.
35	A component delimiter of Comment or Special Instructions is insufficient.
36	Comment or Special Instructions is invalid.
37	A field delimiter of H record is insufficient.
38	Comment or Special Instructions is invalid.
39	There is no record end of H record.
40	A field delimiter of P record is insufficient.
41	Sequence Number of P record is invalid.
44	There is no record end of P record.
45	Application Code is invalid.
46	Dilution is invalid.
47	A field delimiter of O record is insufficient.
50	Instrument Specimen ID is invalid.
57	There is no record end of O record.
59	Sample ID is invalid.
60	Sample No. is invalid.
61	Rack ID is invalid.
62	Rack Position is invalid.
63	A field delimiter of Q record is insufficient.
64	Sequence Number of Q record is invalid.
65	Specimen ID is invalid.
67	There is no record end of Q record.
68	A field delimiter of C record is insufficient.
69	Sequence Number of C record is invalid.
73	There is no record end of C record.

Error recovery process
Nullify entire messages received. (Rejection)
Notify the Host of the reception failure. (Refer to Termination Code: 5.5 Message Termination Record)

7.3.6 ASTM LOWER LAYER

ASTM Lower Layer will receive messages for a transmission request from the Upper Layer; this is then split into Frames and passed on to a Communication Medium to be transmitted to other parties. ASTM Lower Layer will also construct Frames received from a Communication Medium to re-create messages to be transferred to the ASTM Upper Layer as reception messages. Frame's configurations and communication procedures for transmission/reception is explained below.

(1) ASTM Lower Layer Communication Methods

Item	Methods	Explanations
Frame Configurations	For Middle Frame <STX> FN text <ETB> C1 C2 <CR><LF> For Last Frame <STX> FN text <ETX> C1 C2 <CR><LF>	• Control character (characters enclosed in <>): <STX> is control character (HEX 02) <ETB> is control character (HEX 17) <CR> is control character (HEX 0D) <LF> is control character (HEX 0A) <ETX> is control character (HEX 03) • text: text is a part of a split message • FN: FN is a single ASCII number characters and 0 to 7 are used. Indicates sequence number for a Frame; first frame that has been

		split is 1, the second frame is 2, the numbers will increase and after frame 7, the next frame will be 0, next frame will be 1, etc. Which means, the value of FN is; to the initial value of 1 add 1 each time a new frame occurs, then calculate the remainder 8. • C1 and C2: when 1 byte resulting from adding each 1 byte, FN to <ETB> for the middle frame and FN to <EXT> for the last frame, is expressed in hexadecimal, the upper character (16^1) is C1 and the lower character (16^0) is C2. Characters used are 0 to 9 or A to F.
Frame Character configuration of Text	Characters other than <SOH><STX><ETX> <EOT><ENQ><ACK> <DLE><NAK><SYN> <ETB><LF><DC1> <DC2><DC3><DC4>	<SOH> is control character (HEX 01) <EOT> is control character (HEX 04) <ENQ> is control character (HEX 05) <ACK> is control character (HEX 06) <DLE> is control character (HEX 10) <NAK> is control character (HEX 15) <SYN> is control character (HEX 16) <DC1> ~ <DC4> is control character 11 ~ 14)
Maximum length of the Frame	247 characters	For one frame, maximum of 240 characters for text, 7 characters for frame's control characters. Messages within 240 characters will be transmitted as one final frame. Messages more than 240 characters will be split into frames with characters within 240 characters and only the final frame will be the last frame and others will be the middle frames.

(2) ASTM Communication Procedure Matrix

The Communication Procedure Matrix explains the communication procedures from the description of the operation for the occurrence of an event in a condition cell by placing the events horizontally and conditions vertically in the matrix cells. Reception procedures and transmission procedures of the ASTM by this matrix is explained in this section.
Matrix is separated for receptions and transmissions but shares Idle condition.

ASTM Communication Program's initial condition is Idle and the execution of matrix will be done one after another, such as, when a message for transmission request event arrives from the Upper Layer, it will go to transmission process; when a reception request comes from other party through communication medium, it will go to reception process. ASTM will perform either reception or transmission at one time; it cannot process both at the same time.

Procedures for reception of an event and the next condition to go into is described in the cells of the matrix. Process and condition that should be change to is partitioned with a dash and at the head of the name of the condition that should change to will have 'goto'. Other descriptions are explained in the table below.

Writing Method	Explanation
Send *<character>*	Transmits control character. <EOT> is control character (HEX 04) <ENQ> is control character (HEX 05) <ACK> is control character (HEX 06) <NAK> is control character (HEX 15)
Count=1	FN (Frame number) set to initial value 1.
Timer=<Value>	Set timer to <value>. When the <value> seconds have passed, a timeout event will occur. The previous timer setting can be canceled using this setting.
Retry=0	Initializes the retransmit count of the frame.
Retry++	Add 1 to retransmit count.
Count++	Set by adding 1 to FN (frame number) and calculating remaining 8. (Count = (Count + 1) mod 8)
Btimer=<Value>	Btimer is separate from the Timer; as long as this is not '0', transmission is halted. Used to control priority for transmission in an event when transmissions for both directions should occur, by creating a margin of no transmission time.

(3) ASTM Lower Layer Reception Matrix

	Receive *ENQ*	Send Request	Not Ready to Receive	OK to Receive	Arrival of Frame	Receive *EOT*	Timeout	Good Repeat Frame	Good New Frame	Bad Frame
Idle	**goto** Awake	**goto** Data to Send								
Awake			Send *NAK* **goto** Idle	Send *ACK* Count=1 Timer=30 **goto** Receive Waiting						
Receive Waiting					**goto** Frame Received	Btimer=0 **goto** Idle	**goto** Idle			
Frame Received		**goto** Have Data to Send						Send *ACK* Timer=30 **goto** Receive Waiting	Count++ Send *ACK* Timer=30 **goto** Receive Waiting	Send *NAK* Timer=30 **goto** Receive Waiting
Have Data to Send								Send *EOT* Timer=30 **goto** Receive Waiting	Count++ Send *EOT* Timer=30 **goto** Receive Waiting	Send *EOT* Timer=30 **goto** Receive Waiting

Event Name	Explanations
Receive “ENQ”	Received control character ENQ (HEX 05). This is suitable for transmission request form the other party.
Send Request	Received message transmission request from the Upper Layer
Not Ready to Receive	Transmission request has arrived but not ready to receive
OK to Receive	Transmission request has arrived and ready to receive
Arrival of Frame	Received one frame
Receive “EOT”	Received control character EOT (HEX 04). This is suitable for transmission termination request from other party.
Timeout	Timer is down to ‘0’.
Good Repeat Frame	When checking the frame received, it was noticed that its frame number is same as the previous frame received.
Good New Frame	When checking the frame received, it was notice that its frame number is same as the previous frame received with 1 added and remaining of 8 removed.
Bad Frame	One of the following was received. (1) Character not specified in the Frame, (2) Checksum error, (3) Frame number error

Conditions	Explanations
Idle	No reception or transmission state. Shared condition as ASTM transmission procedure matrix.
Awake	Received a transmission request from other party.
Receive Waiting	Waiting to receive a Frame or waiting for the end of transmission from the other party.
Frame Received	Received a Frame from other party.
Have Data to Send	Waiting for reception of a Frame and ready to issue a request to switch to transmission from this side.

(4) ASTM Lower Layer Transmission Procedure Matrix (for 7600)

	Receive *ENQ*	Send Request	Btimer <>0	Btimer=0	Receive *NAK*	Receive *EOT*	Timeout	Receive *ACK*	No Frame	Frame Ready	Retry> 6	Retry<= 6
Idle	**goto** Awake	**goto** Data to Send										
Data to Send			**goto** Idle	Send *ENQ* Count=1 Timer=15 **goto** Send Waiting								
Send Waiting	Btimer=1 **goto** Idle Note 1				Btimer=10 **goto** Idle		Send *EOT* **goto** Idle	Retry=0 **goto** Next Frame				
Next Frame									Send *EOT* **goto** Idle	Send Frame Timer=15 **goto** Send Waiting2		
Send Waiting2					Retry++ **goto** Old Frame	Retry=0 Count++ **goto** Next Frame Note 2	Send *EOT* **goto** Idle	Retry=0 Count++ **goto** Next Frame				
Old Frame											Send *EOT* **goto** Idle	Send Frame Timer=15 **goto** Send Waiting2

Note1:If this is the Host, [Btimer=20/goto Idle]. This will give priority to the transmission by the 7600.

Note 2:If this is the Host, [Send “EOT”, Btimer=15/goto Idle]. This will also give priority to the transmission by the 7600.

Event Name	Explanations
Receive “ENQ”	Received control character ENQ (HEX 05). This is suitable for transmission request form the other party.
Send Request	Received message transmission request from the Upper Layer
Btimer<>0	Transmission has been halted by Btimer.
Btimer=0	Transmission is possible.
Receive *NAK*	Received control character NAK (HEX 15). This is suitable for re-transmission request from the other party.
Receive *EOT*	Received control character EOT (HEX 04). This is suitable for transmission termination request from the other party. 7600s will not accept this request.
Timeout	Timer is down to ‘0’.
Receive *ACK*	Received control character ACK (HEX 06). This is suitable for a normal reception report of a Frame from the other party.
No Frame	There is no more Frames for transmission. (Transmission complete)
Frame Ready	Frame is ready for transmission.
Retry>6	Re-transmission has gone over 6 times; cannot retransmit.
Retry<=6	Still cannot retransmit.

Conditions	Explanations
Idle	No reception or transmission state. Shared condition as ASTM transmission procedure matrix.
Data to Send	Acknowledged message transmission request from the Upper Layer; if transmission is possible, transmission request will be issued to the other party.
Send Waiting	Waiting for response for a transmission request
Next Frame	Prepares the next Frame and transmits
Send Waiting2	Waiting for response for the Frame transmitted
Old Frame	Decides on re-transmission of a Frame

(5) Communication Error Processing at the Lower Level

Lower Level Error Code Table

Alarm Code			
Major.	Minor	Descriptions	Recovery Process
126	1	7600 failed to open session.	Yes
	4	When 7600 tried to transimit, But Host rejected or was not in condition to transmit	No
	5	When 7600 tried to transmit, but Host did not respond. (Transmission Timeout 15 seconds)	Yes
	6	When 7600 transmitted, but the Host was unable to receive; re-transmission is necessary	NO
	7	When 7600 tried to transmit, but Host did not respond. (Reception Timeout 15 seconds)	Yes
	8	Re-transmission has gone over the limit	Yes
	9	When Moular tried to transmit, but the Host had also issued a transmission request	No
	11	7600 Received reception request from Host and became ready for reception; but Host did not transmit. (Reception Timeout 30seconds)	Yes
	12	7600 received reception request from Host; but not in condition to receive	No
	16	Buffer Over Flow Over Flow occurred in the receiving buffer during message receiving. Communication stopped between 7600 and HOST.	No
	17	Retry Over in Error message receiving When 7600 received incorrect message and sent <NAK> to HOST. 7600 retried this process more than 12 times (Upper Retry Limit). Communication stopped between 7600 and HOST.	No
	18	Undefined Error is detected in MBSI	No
	19	Although "7 Bit" format is selected in [SYSTEM]-[HOST Setting] screen, transmitted data contains the character which can only represented in 8 bit format. The character is converted into "#" in 7 bit code.	-
	20	Automatic recovery of connection between HOST and 7600 occurs 5 times consecutively. Host communication has stopped.	No

Recovery Process

“Yes” : 7600 performs initialization of the communication circuit and put on 40 second DELAY.

“No” :7600 do not perform recovery procedure

Attachment

Following Table is the Checked document

rAlarmType	AlarmNo	AlarmMessage	AlarmDesc	AlarmRemedy
110	1	Abnormal Receiving Text from HOST	Abnormal Text has been received from HOST.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	2	Abnormal TS from HOST	No response for the inquiry within a set time in GUI: [Utility]-[System]-[Host Communication].	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	3	Abnormal TS from HOST	No response for the inquiry within 10 minutes.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	5	Abnormal TS from HOST	Application code requested by the HOST is not registered in the 7600; or received application code other than Photometric test, ISE test or serum index test.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	6	Abnormal TS from HOST	Received request for other than pair of Na, K or Na, K, Cl for ISE.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	7	Abnormal TS from HOST	Received request for increased or decreased quantity for other than Sample Type 2 (Urine) of ISE test.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	8	Abnormal TS from HOST	Received request for ISE test is wrong.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	9	Abnormal TS from HOST	Received request for serum index test is wrong.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host

				computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
111	10	Abnormal TS from HOST	Received comment even though the mode was set for no transmission of comments.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	2	Abnormal Automatic Rerun TS from HOST	No response for the inquiry within a set time in GUI: [Utility]-[System]-[Host Communication].	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	3	Abnormal Automatic Rerun TS from HOST	No response for the inquiry within 10 minutes.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	5	Abnormal Automatic Rerun TS from HOST	Application code requested by the HOST is not registered in the 7600; or received application code other than Photometric test, ISE test or serum index test.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	6	Abnormal Automatic Rerun TS from HOST	Received request for other than pair of Na, K or Na, K, Cl for ISE.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	7	Abnormal Automatic Rerun TS from HOST	Received request for increased or decreased quantity for other than Sample Type 2 (Urine) of ISE test.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	8	Abnormal Automatic Rerun TS from HOST	Received request for ISE test is wrong. Received request for other than pair of Na, K or Na, K, C1 for ISE test.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	9	Abnormal Automatic Rerun TS from HOST	Received request for serum index test is wrong. Received request for increased or decreased quantity.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same

				communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
112	10	Abnormal Automatic Rerun TS from HOST	Received comment even though the mode was set for no transmission of comments.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	1	Host Communication Error	7600 failed to open session.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	4	Host Communication Error	When 7600 has sent <ENQ> but Host sent <NAK>. 7600 stop transmission.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	5	Host Communication Error	When 7600 has sent <ENQ>, but Host did not send <ACK> nor <NAK>. (Link Time Out)	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	6	Host Communication Error	When 7600 has sent <STX> with text frame, but Host sent <NAK>. 7600 sent again.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	7	Host Communication Error	When 7600 has sent <STX> with text frame, but Host did not send <ACK> or <NAK>. (Receiving time out)	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	8	Host Communication Error	Re-transmission has gone over the limit (6 times).	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	9	Host Communication Error	When 7600 has sent <ENQ> as transmission request, Host sent <ENQ> as transmission request (Link Contention).	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	11	Host	When 7600 has received, <ACK>	a. Check the host computer. Is it ON?

		Communication Error	or <NAK> as reception request from Host and became ready for reception; but Host did not transmit <STX> nor <EOT> in 30 sec. (Reception Timeout).	b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	12	Host Communication Error	7600 received reception request from Host; but not in condition to receive.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	16	Host Communication Error	Buffer Over Flow Over Flow occurred in the receiving buffer during message receiving. Communication stopped between 7600 and HOST.	a. Check the host computer. Is it ON? b. Verify Host Communication on START CONDITIONS. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	17	Host Communication Error	Retry Over in Error message receiving When 7600 received incorrect message and sent <NAK> to HOST. 7600 retried this process more than 12 times (Upper Retry Limit). Communication stopped between 7600 and HOST.	a. Check the host computer. Is it ON? b. Verify Host Communication on START CONDITIONS. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	18	Host Communication Error	Undefined Error is detected in MBSI	a. Check the host computer. Is it ON? b. Verify Host Communication on START CONDITIONS. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	19	Host Communication Error	Although "7 Bit" format is selected in [SYSTEM]-[HOST Setting] screen, transmitted data contains the character which can only represented in 8 bit format. The character is converted into "#" in 7 bit code.	a. Check the host communication setting in [SYSTEM]-[HOST Setting] screen. b. Verify the characters which are sent to HOST. c. Resume operation; if alarm recurs, call Technical Support.
126	20	Host Communication Error	Automatic recovery of connection between HOST and 7600 occurs 5 times consecutively. Host communication has stopped.	a. Check the host computer. Is it ON? b. Verify Host Communication on START CONDITIONS. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	21	Host Communication Error	No valid Record.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	22	Host Communication Error	First Record is not a Header Record.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer.

				d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	23	Host Communication Error	Undefined Record.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	24	Host Communication Error	Data other than specified.	a. Check the host computer. Is it ON? b. Verify Host Communication on Start Conditions. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.
126	25	Host Communication Error	Data other than specified	a. Check the host computer. Is it ON? b. Verify Host Communication on START CONDITIONS. c. Check cable connections between the 7600 and host computer. d. Check the host computer transmit condition. e. Ensure that the host and the 7600 are utilizing the same communication configuration. f. Resume operation; if alarm recurs, call Technical Support.

7.4.2 Preface

This document contains examples of communication text between 7600 system and External System of 7600 based on the specification 7.2 and 7.3.

Caution
Character of Space (ASCII CODE 0x20) in any text is shown as “ “ (one character size rectangle).
This example text contains some not realistic case for standard clinical chemistry analysis to show variable examples of communication.
In this document, 7600 is shown as “H7600”, External system is shown as "HOST".

Following words are used;
S.No : Sample Number.
TS : Test Selection.
Application Code 601,602 :Photometric Test
Application Code 1011,1012,103:Elecsys Test

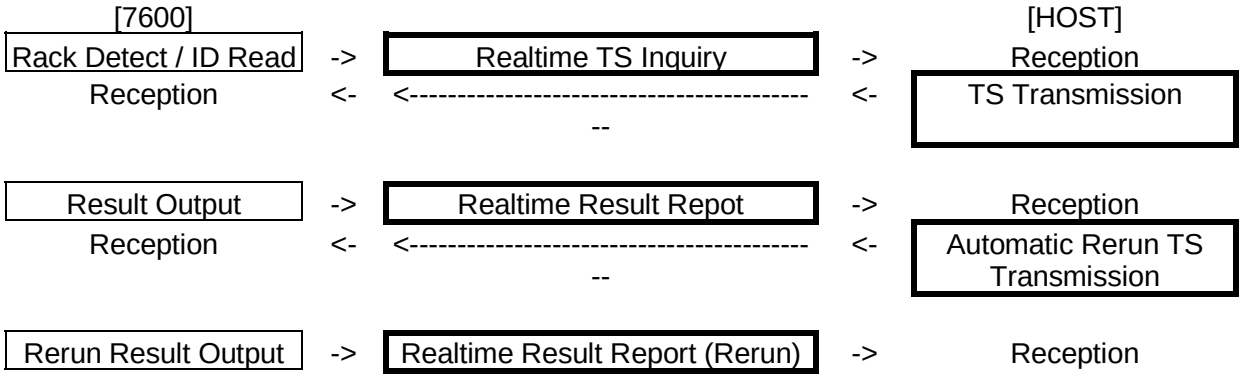
7.4.3 Communication Order on Application Layer (Abstract of information flow)

According to “7.2 HOST COMMUNICATION” , flow of information based on supported services is explained in this section.

(1) Real Time Communication

When following triggers occur, automatically 7600 send to Host a message. After 7600 send the message, 7600 waits acknowledgement from HOST during the time period set on GUI. These communication style is called “Real time communication”. Refer to “7.2.2 REALTIME COMMUNICAION”.

Following diagram shows the case of “TS inquiry = OK, Result transmission = OK and Automatic Rerun = OK” in [Utility]-[System]-[Host communication] screen.



(2) Batch Communication

When an operator input the command to send information to HOST on 7600 GUI, 7600 sends information, which described in “7.2.3 BATCH COMMUNICATION”, to HOST as batch transmission.

In batch transmission, there is no automatic communication trigger. This rule is same as batch transmission from HOST.

7.4.4 Communication Example on ASTM Upper Layer

In this section, some examples of communication on ASTM Upper Layer are shown.(See ASTM 1694-91).

(1) Example of Realtime Communication

Example condition is ;
MODE: Sample No. Mode
Sample No.: 1234
Sample Type: Serum

(a) Realtime TS Inquiry (7600 to HOST)

Current Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
  P|1<CR>
    Q|1|^^1234/|^^Thisisasample•••••••••/1/5036/1/R1/R|||||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
    Q|1|^^Thisisasample•••••••••^1234^5036^1^^S1^SC||ALL|||||||O<CR>
L|1|N<CR>
```

Detail information
Rack No.: 36
Rack Position: 1
Rack Type: Serum/Routine
Sample ID: “Thisisasample”
Sample ID is handled as comment in Sample No. Mode.

“H7600” in SenderName or ID field in H Record and “HOST” in receiverID field are reflected the string input in 7600 GUI :[Utility]-[System]-[Host Communication].
“1” of “H7600^1” shows that communication program version of 7600 is “1”.
<H Record: Refer to 7.3.5(4) Message Header Record>
<Q Record: Refer to 7.3.5(10) Request Information Record>

(b) Response to inquiry (a) (HOST to 7600)

This message is an example of response to inquiry.

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
    O|1|1234^••••••••••••••••••••••^1^5036^1|R1|^^^601/¥^^^602/dec¥^^^603/400|R||20000630150536||||N||48^Y^M||||||comment1^
    comment2^comment3^comment4^comment5||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••••|1234^5036^1^^S1^SC|^^^601^¥^^^602^dec¥^^^603^400|R||20000630150536||||N||||1||||||||||O<CR>
    C|1|I|comment1^comment2^comment3^comment4^comment5|G<CR>
L|1|N<CR>
```

7600 use a set of information to check the relationship of inquiry and response. A set of information is called “Key information”. Refer to “7.2.2(2)(c) Inquiry Key Information”.

In this example, following items are used as Key information. “

Item	ASTM Field name	Contents	Description in message
Sample Number	Sample No	1234	“1234”
Sample Type	Sample Type	Serum	“1”
Identification Detail	Instrument Specimen ID	1st Analysis	“R1”
Sample Identification	Priority	Routine Analysis	“R””

If a field is not defined as key information, a change in the field is permitted.

In this example, HOST change sample ID field from “Thisisasample“ to ” “(13 space characters).

Details of test selection information is following;

Application Code	direction	Comment
601	Request of the analysis with the same dilution ratio as first run.	
602	Request of the analysis with the same dilution ratio as rerun run.	
603	Request of the analysis with dilution ratio =400.	

Other Test are measured according to existed TS information in 7600.

<O Record: Refer to “7.3.5(7) Test Order Record”>

SenderName or ID ”HOST^1” and ReceiverID ”H7600” can be set by HOST side.

"1" of "HOST^1" means HOST program version number. Host can define program version as string which contains 1 character and more. Delimiter "^" is required.

(c) Real Time Result Transmission (7600 to Host)

Current Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^REAL|P|1<CR>
  P|1<CR>
    O|1|1234^••••••••••••••••••••••^1^5036^1|R2|^^^601/1¥^^^602/1¥^^^603/1¥^^^604/1|R||19970612150536||||N||48^Y^M||SC|||••
    ••••|comment1••••••••••••••••••••^comment2••••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|||2000063
    0151732|||F<CR>
      R|1|^^^601/1/not|2.00|g/L||N||F|||||E12<CR>
        C|1|I|0|IC|1|I|0|I<CR>
      R|2|^^^602/1/not|2.00|g/L||N||F|||||E12<CR>
        C|1|I|0|I<CR>
      R|3|^^^603/1/not|2.00|g/L||N||F|||||E12<CR>
        C|1|I|0|I<CR>
      R|4|^^^604/1/not|1^2.00|g/L||N||F|||||E12<CR>
        C|1|I|0|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^REAL|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••••|1234^5036^1^^S1^SC|^^^601^¥^^^602^dec¥^^^603^400|R||20000630150536||||N||||1|||||||200006301
    51732|||F<CR>
    C|1|I|comment1••••••••••••••••••••^comment2••••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|G<CR>
      R|1|^^^601/1/not|2.00|g/L||N||F||••••••|||E12<CR>
        C|1|I|0|I<CR>
      R|2|^^^602/2/not|2.00|g/L||N||F||••••••|||E12<CR>
        C|1|I|0|I<CR>
      R|3|^^^603/400/not|2.00|g/L||N||F||••••••|||E12<CR>
        C|1|I|0|I<CR>
      R|4|^^^604/400/not|1^2.00|g/L||N||F||••••••|||E12<CR>
        C|1|I|0|I<CR>
L|1|N<CR>
```

Application codes are assigned as follows in this example.

Application code 601-603 : Quantitative test

Application code 604 : Qualitative test

For Elecsys tests, Dilution information in Result transmission will be different from the one transmitted from HOST.

<O Record: Refer to “7.3.5(7) Test Order Record”>

<R Record: Refer to “7.3.5(8) Result Record”>

<C Record: Refer to “7.3.5(9) Comment Record”>

(d) Automatic Rerun TS Transmission (HOST to 7600)

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REAL|P|1<CR>
  P|1<CR>
    O|1|1234^••••••••••••••••••••••^1^5036^1|R2|^^^605/1¥^^^606/1|R||20000630130531||||N||48^Y^M||SC||||comment1^comment2^c
    omment3^comment4^comment5|||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REAL|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••••|1234^5036^1^^S1^SC|^^^605^1¥^^^606^1|R||20000630130531||||N||||1|||||||||O<CR>
    C|1|I|comment1^comment2^comment3^comment4^comment5|G<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>

(2) Sample No. Mode

(a) Routine sample TS Inquiry of 1st run and response

Refer to 7.4.4(1)

(b) Routine Manual Rerun TS Inquiry

(i) Realtime TS Inquiry (7600 to Host)

Mode: Sample No.
Sample Type: Serum
Sample No.: 1001
Rerun Rack ID: A020
Rack Position: 1

Current Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
 P|1<CR>
  Q|1|^^1001/••••••••••••••••••••••/1/A020/1/R2/R|||||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
 Q|1|^^••••••••••••••••••••••^1001^A020^1^^S1^SC||ALL||||||||O<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>

(ii) Response to Inquiry (HOST to 7600)

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
    O|1|1001^••••••••••••••••••••••••••••••••••^1^A020^1|R2|^^^6043/¥^^^4605/|R||20000630130531||||N||48^Y^M||||||co
    mment1^comment2^comment3^comment4^comment5||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••••••|1001^A020^1^^S1^SC|^^^604^¥^^^605^|R||20000630130531||||N||||1|||||||||O<CR>
    C|1|I|comment1^comment2^comment3^comment4^^comment5|G<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>

(iii) Inquiry to HOST for Unassigned Samples in Rerun Rack (7600 to HOST)

Mode: Sample No.
Sample Type: Serum
Sample No.: Unassigned
Rerun Rack ID: A001
Rack Position: 3

Current Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
  P|1<CR>
    Q|1|^^0/••••••••••••••••••••••••1/A001/3/R2/R|||||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
 Q|1|^^••••••••••••••••••••••^0^A001^3^^S1^SC||ALL|||||||O<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>

Rerun rack ID and rack position was not assigned on 7600 screen, then 7600 inquires sample .No.:"0".
In this case, Sample No. can be assigned from HOST.

(iv) Response to Inquiry (HOST to 7600)

Sample No.: 10000

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
    O|1|10000^••••••••••••••••••••••^1^A001^3|R2|^^^604/¥^^^605/|R||20000630130531||||N||48^Y^M||||||comment1^comment2^comm
    ent3^comment4^comment5||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••••|10000^A001^3^^S1^SC|^^^604^¥^^^605^|R||20000630130531||||N||||1||||||||||O<CR>
    C|1|I|comment1^comment2^comment3^comment4^comment5|G<CR>
L|1|N<CR>
```

<O Record: Refer to "7.3.5(7) Test Order Record">

(c) STAT TS Inquiry of 1 st run and Response

(i) Realtime TS inquiry (7600 to HOST)

Mode: Sample No.
Sample Type: Urine
Sample Identification (Priority) : STAT
Sample No.: 10
Rerun Rack ID: 4001
Rack Position: 5

Current Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
  P|1<CR>
    Q|1|^^10/••••••••••••••/12/4001/5/R1/S|||||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|TSREQ^REAL|P|1<CR>
    Q|1|^^••••••••••••••••••••••^10^4001^5^^S1^SC||ALL|||||||O<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>

(ii) Response to Inquiry (HOST to 7600)

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
    O|1|10^••••••••••••••••••••^10^4001^5|R1|^^^601/¥^^^602/dec¥^^^603/400|S||20000630150835||||N||48^Y^M||||||comment1^c
    omment2^comment3^comment4^comment5||||||O<CR>
L|1|N<CR>
```

New mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••|10^4001^5^^S1^SC|^^^601^¥^^^602^dec¥^^^603^400|S||20000630150835||||N||||1|||||||||||O<CR>
    C|1|I|comment1^comment2^comment3^comment4^comment5|G<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>

(d) Result Inquiry from HOST (HOST to 7600)

Mode: Sample No.
Sample Type: Serum
Sample No.: 1234
Current Mode

```
H|¥^&|||HOST^1|||||H7600|RSREQ^REAL|P|1<CR>
  P|1<CR>
    Q|1|^^1234/••••••••••••••••••••••••••••••••••/1/5036/1/R1/R|||||||||F<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|RSREQ^REAL|P|1<CR>
    Q|1|^^•••••••••••••••••••••••^1234^5036^1^^S1^SC|||||||||F<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>

(e) Transmission of Result from GUI

Refer to 7.4.4(3)(e).

(f) Reaction Monitor data (Absorbance) Batch Transmission (7600 to HOST)

Module Type : D
Sample No.: 1091
Application Code: 24

Current Mode

```
H|¥^&|||H7600^1|||||HOST|ABUPL^BATCH|P|1<CR>
  P|1<CR>
    O|1|1091^••••••••••••^1^5008^1|R1|^^^24/|R|||||||48^Y^M||SC|||••••••
    |comment1^••••••••••••••••••••^comment2••••••••••••••^comment3••••••••••^comment4^•••••••^comment5••|||199709092
    13721|||F<CR>
      R|1|^^^24/|102|g/l||N||F|||||D1<CR>
        C|1|I|0|I<CR>
        M|1|ABS|D1|2|O|10|50|195¥197¥195¥194|2¥-1¥0¥-2¥1¥0¥-1¥3¥2¥0¥0¥3¥-1¥1¥1¥1¥1¥1¥1¥3
        ¥1¥3¥¥¥3¥4¥2¥1¥2¥2¥-1¥2¥4¥-1¥3¥3¥0¥-1¥-2¥0¥2¥-1¥-9¥-4¥-1¥0¥-3¥1¥-2¥1<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|ABUPL^BATCH|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••|1091^5008^1^^S1^SC|^^^24^|R||19970909213721||||N||||1|||||||19970909213721|||F<CR>
    C|1|I|comment1••••••••••••••••••••^comment2••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|G<CR>
      R|1|^^^24/|102|g/L||N||F||••••••|||D1<CR>
        C|1|I|0|I<CR>
        M|1|ABS|D1|2|O|10|50|195¥197¥195¥194|2¥-1¥0¥-2¥1¥0¥-1¥3¥2¥0¥0¥3¥-1¥1¥1¥1¥1¥1¥1¥3
        ¥1¥3¥¥¥3¥4¥2¥1¥2¥2¥-1¥2¥4¥-1¥3¥3¥0¥-1¥-2¥0¥2¥-1¥-9¥-4¥-1¥0¥-3¥1¥-2¥1<CR>
L|1|N<CR>
```

<M Record: Refer to “7.3.5(13) Absorbance Record”>

(g) Elecsys Row Data Batch Transmission(7600 to HOST)

Sample No.: 1024
Application Code: 1011

Current Mode

```
H|¥^&|||H7600^1|||||HOST|EFUPL^BATCH|P|1<CR>
  P|1<CR>
    O|1|1234^••••••••••••••••••••••^1^A020^1|R2|^^^601/1|R||20000630150536||||N||48^Y^M||SC|||••••••|comment1••••••••••••
    ••••••••^comment2•••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|||20000630151732|||F<CR>
      R|1|^^^601/1/not|2.00|g/L||N||F|||||E12<CR>
        C|1|I|0|I<CR>
           M|1|EFS|E12|10¥11¥12¥13¥14¥15¥16¥17¥18¥19¥110¥111¥112¥113¥114¥115¥116¥117¥118¥119¥210¥211¥212¥213¥214¥215¥216¥217
           ¥218¥219¥310¥311¥312¥313¥314¥315¥316¥317¥318¥319¥410¥411¥412¥413¥414¥415¥416¥417¥418¥419¥510¥511¥512¥513¥514¥515¥5
           16¥517¥518¥519¥610¥611¥612¥613¥614¥615¥616¥617¥618¥619¥710¥711¥712¥713¥714¥715¥716¥717¥718¥719¥810¥811¥812¥813¥814
           ¥815¥816¥817¥818¥819¥910¥911¥912¥913¥914¥915¥916¥917¥918¥919¥1010¥1011¥1012¥1013¥1014¥1015¥1016¥1017¥1018¥1019¥111
           0¥1111¥1112¥1113¥1114¥1115¥1116¥1117¥1118¥1119¥1210¥1211¥1212¥1213¥1214¥1215¥1216¥1217¥1218¥1219¥1310¥1311¥1312¥13
           13¥1314¥1315¥1316¥1317¥1318¥1319¥1410¥1411¥1412¥1413¥1414¥1415¥1416¥1417¥1418¥1419¥1510¥1511¥1512¥1513¥1514¥1515¥1
           516¥1517¥1518¥1519¥1610¥1611¥1612¥1613¥1614¥1615¥1616¥1617¥1618¥1619¥1710¥1711¥1712¥1713¥1714¥1715¥1716¥1717¥1718
           ¥1719¥1810¥1811¥1812¥1813¥1814¥1815¥1816¥1817¥1818¥1819¥1910¥1911¥1912¥1913¥1914¥1915¥1916¥1917¥1918¥1919|326.0<CR
           >
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|EFUPL^BATCH|P|1<CR>
  P|1|||||||M||||||48^YP|1<CR>
    O|1|••••••••••••••••••••••|1234^A020^1^^S1^SC|^^^601^1|R||20000630150536||||N||||1|||||||20000630151732|||F<CR>
      C|1|I|comment1••••••••••••••••••••^comment2•••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|G<CR>
        R|1|^^^601/1/not|2.00|g/L||N||F||••••••|||E12<CR>
           C|1|I|0|I<CR>
              M|1|EFS|E12|10¥11¥12¥13¥14¥15¥16¥17¥18¥19¥110¥111¥112¥113¥114¥115¥116¥117¥118¥119¥210¥211¥212¥213¥214¥215¥216¥21
              7¥218¥219¥310¥311¥312¥313¥314¥315¥316¥317¥318¥319¥410¥411¥412¥413¥414¥415¥416¥417¥418¥419¥510¥511¥512¥513¥514¥51
              5¥516¥517¥518¥519¥610¥611¥612¥613¥614¥615¥616¥617¥618¥619¥710¥711¥712¥713¥714¥715¥716¥717¥718¥719¥810¥811¥812¥81
              3¥814¥815¥816¥817¥818¥819¥910¥911¥912¥913¥914¥915¥916¥917¥918¥919¥1010¥1011¥1012¥1013¥1014¥1015¥1016¥1017¥1018¥1
              019¥1110¥1111¥1112¥1113¥1114¥1115¥1116¥1117¥1118¥1119¥1210¥1211¥1212¥1213¥1214¥1215¥1216¥1217¥1218¥1219¥1310¥131
              1¥1312¥1313¥1314¥1315¥1316¥1317¥1318¥1319¥1410¥1411¥1412¥1413¥1414¥1415¥1416¥1417¥1418¥1419¥1510¥1511¥1512¥1513
              ¥1514¥1515¥1516¥1517¥1518¥1519¥1610¥1611¥1612¥1613¥1614¥1615¥1616¥1617¥1618¥1619¥1710¥1711¥1712¥1713¥1714¥1715¥1
              716¥1717¥1718¥1719¥1810¥1811¥1812¥1813¥1814¥1815¥1816¥1817¥1818¥1819¥1910¥1911¥1912¥1913¥1914¥1915¥1916¥1917¥191
              8¥1919|326.0M|1|ABS|D1|2|O|10|50|195¥197¥195¥194|2¥-1¥0¥-2¥1¥0¥-1¥3¥2¥0¥0¥3¥-1¥1¥1¥1¥1¥1¥3 ¥1¥3¥¥¥3¥4¥2¥1¥2¥2
              ¥-1¥2¥4¥-1¥3¥3¥0¥-1¥-2¥0¥2¥-1¥-9¥-4¥-1¥0¥-3¥1¥-2¥1<CR>
L|1|N<CR>
```

<M Record: Refer to “7.3.5() Elecsys Row data(effective signal) Record>

(h) Test Selection Batch Download

Refer to 7.4.4(3)(g).

(3) ID Mode

(a) Routine sample TS inquiry and response for 1 st run

(i) Realtime TS Inquiry (7600 to HOST)

Mode: ID
Sample Type: Serum
Sample ID: 36
Current Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
 P|1<CR>
  Q|1|^^0/••••••••••••••••••••36••••••••••••36/1/5113/2/R1/R|||||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
  Q|1|^^••••••••••••••••••••36^0^5113^2^^S1^SC||ALL|||||||O<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>

(ii) Response for TS inquiry (HOST to 7600)

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
    O|1|0^••••••••••••••••••••36^1^5113^2|R1|^^^601/¥^^^602/dec¥^^^603/400|R||20000630150536|||N||48^Y
    ^M||||||comment1^comment2^comment3^comment4^comment5||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|••••••••••••••••••••36|0^5113^1^^S1^SC|^^^601^1|R||20000630150536||||N||||1|||||||2000063015173
    2|||F<CR>
      C|1|I|comment1^comment2^comment3^comment4^^comment5|G<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>

(iii) TS Ask in Barcode Read Error (HOST to 7600)

Mode: ID
Sample Type: Serum
Sample ID: None
Rack ID: 5001
Rack Position: 5

Current Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
   P|1<CR>
   Q|1|^^0/**********************/1/5001/5/R1/R||||||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
  P|1||||||M||||||48^Y<CR>
   Q|1|^^**********************^0^5001^5^^S1^||ALL||||||||O<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>

Barcode read error sample was not assigned on 7600 screen, then 7600 inquires sample ID:”**********”.
In this case, Sample ID can be assigned from HOST.

(iv) Response for TS inquiry (HOST to 7600)

Sample ID: 1234567890123

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
    O|1|0^·········1234567890123^1^5001^5|R1|^^^601/¥^^^602/dec¥^^^603/400|R|||||N||48^Y^M|||||comme
    nt1^comment2^comment3^comment4^comment5|||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
 P|1|||||||M||||||48^Y<CR>
  O|1|·········1234567890123|0^5001^1^^S1^SC|^^^601^1|R||20000630131236||||N||||1||||||||||F<CR>
    C|1|I|comment1·····················^comment2···················^comment3···········^comment4·······^comment5··|G<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>

(b) Routine Manual Rerun TS Inquiry and Response

Refer to 7.4.4(2)(b).

(c) Stat TS inquiry and response for 1 st Run

Refer to 7.4.4(2)(c).

(d) Result Inquiry from HOST

Refer to 7.4.4(2)(d).

(e) Result transmission from GUI of 7600 (7600 to HOST)

Sample ID : 36
Application Code: 601 (Data alarm 42 is attached)

Current Mode

```
H|¥^&|||H7600^1||||HOST|RSUPL^BATCH|P|1<CR>
 P|1<CR>
  O|1|0^••••••••••••36^1^5113^1|R1|^^^601/1|R||20000630150536||||N||48^Y^M||SC|||••••••|comment1••••••
  ••••••••••••••••^comment2••••••••••••••••^comment3••••••••••••^comment4•••••••^comment5••|||200
  00630151732|||F<CR>
   R|1|^^^601/1/not|9.30|g/L||N||F|||||E12<CR>
    C|1|I|42|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|RSUPL^BATCH|P|1<CR>
 P|1|||||||M||||||48^Y<CR>
  O|1|••••••••••••••••••••36|0^5113^1^^S1^SC|^^^601^1|R||20000630150536||||N||||1|||||||20000630151732|||F
  <CR>
   C|1|I|comment1••••••••••••••••••••^comment2••••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|G<CR>
    R|1|^^^601/1/not|9.30|g/L||A||F||••••••|||E12<CR>
     C|1|I|42|I<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>
<R Record: Refer to “7.3.5(8) Result Record”>
<C Record: Refer to “7.3.5(9) Comment Record>

(f) Reaction Monitor Batch Download

Refer to 7.4.4(2)(f).

(g) Elecsys Row Data Batch Transmission

Refer to 7.4.4(2)(g).

(h) TS Batch Download

(i) Routine Batch TS Download for 1 st run (HOST to 7600)

Sample Type: Serum
Sample ID: 462

Current Mode

```
H|¥^&|||HOST^1||||H7600|TSDWN^BATCH|P|1<CR>
 P|1<CR>
    O|1|0^••••••••••••••••••462^1^5001^1|R1|^^^601/¥^^^602/dec¥^^^603/400|R||20000630150536|||N||48^
    Y^M|||||comment1^comment2^comment3^comment4^comment5|||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1||||H7600|TSDWN^BATCH|P|1<CR>
 P|1||||||M|||||48^Y<CR>
  O|1|••••••••••••••••••462|0^5001^1^^S1^SC|^^^601^dec¥^^^602^20|R||20000630150536|||A||||1|||||||||
  |O<CR>
    C|1|I|Comment1^Comment2^Comment3^Comment4^Comment5|G<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>

(4) QC Sample

(a) Realtime ISE Control result transmission (7600 to HOST)

Control Sample No.: 3
Sequence No.: 1
Control Name: ise_cont
Sample No.: <Control No.:=3, Sequence No.=1> then 3 * 1000 + 1 =3001

Current Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^REAL|P|1<CR>
 P|1<CR>
  O|1|3001^ise_cont•••••^1^3001^5|Q|^^^989/¥^^^990/¥^^^991/|||||||Q||||SC|||••••••|^^^^|||1997092913
  0958|||F<CR>
   R|1|^^^989/|5.8|g/l||N|||||||ISE1<CR>
    C|1|I|0|I<CR>
   R|2|^^^990/|13.9|g/l||N|||||||ISE1<CR>
    C|1|I|0|I<CR>
   R|3|^^^991/|3.7|g/l||N|||||||ISE1<CR>
    C|1|I|0|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^REAL|P|1<CR>
 P|1||||||U||||||^<CR>
  O|1|ise_cont•••••|3001^3001^1^^QC^SC|^^^989^¥^^^990^¥^^^991^|||||||Q||||1||||||19970929130958|||F
  <CR>
    R|1|^^^989/|5.8|g/L||N||F||••••••|||ISE1<CR>
     C|1|I|0|I<CR>
    R|1|^^^990/|13.9|g/L||N||F||••••••|||ISE1<CR>
     C|1|I|0|I<CR>
    R|1|^^^991/|3.7|g/L||N||F||••••••|||ISE1<CR>
     C|1|I|0|I<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>
<R Record: Refer to “7.3.5(8) Result Record”>
<C Record: Refer to “7.3.5(9) Comment Record”>

(b) Photometric QC Sample result batch transmission (7600 to HOST)

Control Sample No.: 60
Sequence No.: 150
Control Name: cont001
Sample No.: <Control No.:=60, Sequence No.=150> then 60 * 1000 + 150 =60150

Current Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^BATCH|P|1<CR>
 P|1<CR>
  O|1|60150^cont001••••••^1^3001^1|Q|^^^1/|||||||Q||||SC|||••••••|^^^^|||19970929130958|||F<CR>
   R|1|^^^1/|31.2|g/l||L|||||||P1<CR>
    C|1|I|0|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^BATCH|P|1<CR>
 P|1|||||||U|||||||^<CR>
  O|1| cont001••••••|60150^3001^1^^QC^SC|^^^1^|||||||Q||||1|||||||19970929130958|||F<CR>
    R|1|^^^1/|31.2|g/L||N||F||••••••|||P1<CR>
     C|1|I|0|I<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>
<R Record: Refer to “7.3.5(8) Result Record”>
<C Record: Refer to “7.3.5(9) Comment Record”>

(c) Elecys QC Sample Sample result realtime Transmission.(7600 to HOST)

Control Sample No.: 2
Sequence No.: 1
Control Name: QCNameABCD
Sample No.: <Control No.:=2, Sequence No.=1> then 2 * 1000 + 1 =2001

Current Mode

```
H|¥^&|||H7600^1||||HOST|RSUPL^REAL|P|1<CR>
  P|1<CR>
    O|1|2001^QCNameABCD••••••••••••^1^3001^1|Q|^^^601/2|||||||Q||||SC|||••••••|^^^^|||20000520010000|
    ||F<CR>
      R|1|^^^601/2/not|0.000|g/L||N|||||||E11<CR>
        C|1|I|0|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|RSUPL^REAL|P|1<CR>
  P|1|||||||U|||||||^<CR>
    O|1|QCNameABCD••••••••••••|2001^3001^1^^QC^SC|^^^601^2|||||||Q||||1|||||||20000520013008|||F<CR>
    C|1|I|^^^^|G<CR>
      R|1|^^^601/2/not|0.000|g/L||N||||••••••|||E11<CR>
        C|1|I|0|I<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>
<R Record: Refer to “7.3.5(8) Result Record”>
<C Record: Refer to “7.3.5(9) Comment Record”>

(d) Elecsys QC Sample Sample result batch Transmission.(7600 to HOST)

Control Sample No.: 2
Sequence No.: 1
Control Name: QCNameABCD
Sample No.: <Control No.:=2, Sequence No.=1> then 2 * 1000 + 1 =2001

Current Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^REAL|P|1<CR>
  P|1<CR>
    O|1|2001^QCNameABCD••••••••••••^1^3001^1|Q|^^^601/2|||||||Q||||SC|||••••••|^^^^|||20000520010000|
    ||F<CR>
      R|1|^^^601/2/not|0.000|g/L||N|||||||E11<CR>
        C|1|I|0|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^REAL|P|1<CR>
  P|1|||||||U|||||||^<CR>
    O|1|QCNameABCD••••••••••••|2001^3001^1^^QC^SC|^^^601^2|||||||Q||||1|||||||20000520013008|||F<CR>
    C|1|I|^^^^|G<CR>
      R|1|^^^601/2/not|0.000|g/L||N||||••••••|||E11<CR>
        C|1|I|0|I<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>
<R Record: Refer to “7.3.5(8) Result Record”>
<C Record: Refer to “7.3.5(9) Comment Record”>

(e) Photometric QC Sample Reaction Monitor (Abs.) Data Transmission.(7600 to HOST)

Control Sample No.: 1
Sequence No.: 1
Control Name: cont001
Sample No.: <Control No.:=1, Sequence No.=1> then 1 * 1000 + 1 =3001
Application Code : 1

Current Mode

```
H|¥^&|||H7600^1|||||HOST|ABUPL^BATCH|P|1<CR>
 P|1<CR>
  O|1|1001^cont001••••••^1^3001^1|Q|^^^1/||||||||||SC|||••••••|^^^^|||19970929130958|||F<CR>
    R|1|^^^1/|31.2|g/l||N|||||||P1<CR>
      C|1|I|0|I<CR>
      M|1|ABS|P1|1||3|11|-3559¥-3560¥-3560¥-3561|249¥247¥242¥241¥242¥254¥248
      ¥242¥235¥214¥229<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|ABUPL^BATCH|P|1<CR>
  P|1||||||U||||||^<CR>
    O|1| cont001••••••|1001^3001^1^^QC^SC|^^^1^|||||||Q||||1|||||||20000520013008|||F<CR>
    C|1|I|^^^^|G<CR>
      R|1|^^^1/|31.2|g/L||N||||••••••|||P1<CR>
        C|1|I|0|I<CR>
        M|1|ABS|P1|1||3|11|-3559¥-3560¥-3560¥-3561|249¥247¥242¥241¥242¥254¥248
        ¥242¥235¥214¥229<CR>
L|1|N<CR>
```

<M Record: Refer to “7.3.5(13) Absorbance Record”>

(f) **Elcsys QC Sample Row Data Transmission.(7600 to HOST)**

Control Sample No.: 2
Sequence No.: 1
Control Name: QCNameABCD
Sample No.: <Control No.:=2, Sequence No.=1> then 2 * 1000 + 1 =2001

Current Mode

```
H|¥^&|||H7600^1|||||HOST|EFUPL^BATCH|P|1<CR>
 P|1<CR>
  O|1|2001^QCNameABCD•••••••••••••^1^3001^1|Q|^^^601/2|||||||Q||||SC|||••••••|••••••••••••••••••••••••••••
  •••^•••••••••••••••••••••••••^••••••••••••••••••••^••••••••^•••••••^••••••••••|||20000520010000|||F<CR>
   R|1|^^^601/2/not|0.000|g/L||N|||||||E11<CR>
    C|1|I|0|I<CR>
    M|1|EFS|E11|1¥2¥3¥4¥5¥6¥7¥8¥9¥10¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥11¥21¥31¥41¥51¥61¥71¥81¥91¥101|1.00<CR>
 L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|EFUPL^BATCH|P|1<CR>
 P|1|||||||U||||||^<CR>
  O|1|QCNameABCD•••••••••••••|2001^3001^1^^QC^SC|^^^601^2|||19700101000014||||Q||||1|||||||2000052001
  0000|||F<CR>
  C|1|I|••••••••••••••••••••••••••••••^•••••••••••••••••••••••••^••••••••••••••••••••^••••••••^•••••••^••••••••••|G<CR>
    R|1|^^^601/2/not|0.000|g/L||N||F||••••••|||E11<CR>
    C|1|I|0|I<CR>
    M|1|EFS|E11|1¥2¥3¥4¥5¥6¥7¥8¥9¥10¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0¥0
    ¥0¥0¥0¥0¥0¥0¥0¥0¥11¥21¥31¥41¥51¥61¥71¥81¥91¥101|1.00<CR>
 L|1|N<CR>
```

(5) Calibrator

(a) Photometric Calibrator (STD) result transmission

(i) Case 1 (7600 to HOST)

Method: 2points
Sample : STD1 and STD3
Current Mode

```
H|¥^&|||H7600^1||||HOST|PCUPL^REAL|P|1<CR>
 M|1|PCR|••••••|^^^1|P1|16|130|33^2428^268^1310^^¥^^^^^¥77^2474^172^1331^^¥^^^^^¥^^^^^¥^^^^^<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|PCUPL^REAL|P|1<CR>
 M|1|PCR|••••••|^^^1|P1|16|130|33^2428^268^1310^^¥^^^^^¥77^2474^172^1331^^¥^^^^^¥^^^^^¥^^^^^<CR>
L|1|N<CR>
```

<M Record: Refer to “7.3.5(11) Photometric Calibration Result Record”>

(ii) Case 2 (7600 to HOST)

Method: SPAN
Sample : STD3
Current Mode

```
H|¥^&|||H7600^1||||HOST|PCUPL^REAL|P|1<CR>
 M|1|PCR|••••••|^^^2|P1|16|130|^^^^^¥^^^^^¥77^2474^172^1331^^¥^^^^^¥^^^^^¥^^^^^<CR>
 L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|PCUPL^REAL|P|1<CR>
 M|1|PCR|••••••|^^^2|P1|16|130|^^^^^¥^^^^^¥77^2474^172^1331^^¥^^^^^¥^^^^^¥^^^^^<CR>
L|1|N<CR>
```

<M Record: Refer to “7.3.5(11) Photometric Calibration Result Record”>

(b) ISE Calibrator result transmission (7600 to HOST)

Current Mode

```
H|¥^&|||H7600^1||||HOST|ICUPL^REAL|P|1<CR>
 M|1|ICR|••••••|ISE1|14|14|14|19^^^19^20^22^16^|19^^^19^20^22^16^|19^^^19^20^22^16^|-324^-324^-324^-
 324^^^2147483649^-2147483649|-324^-324^-324^-324^^^2147483649^-2147483649|-324^-324^-324^-324^^^2147
 483649^-2147483649<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|ICUPL^REAL|P|1<CR>
 M|1|ICR|••••••|ISE10|14|14|14|19^^^19^20^22^16^|19^^^19^20^22^16^|19^^^19^20^22^16^|-324^-324^-324^
 -324^^^2147483649^-2147483649|-324^-324^-324^-324^^^2147483649^-2147483649|-324^-324^-324^-324^^^214
 7483649^-2147483649<CR>
L|1|N<CR>
```

<M Record: Refer to “7.3.5(12) ISE Calibration Result Record”>

(c) Calibrator (STD) result transmission

(i) Case 1 (7600 to HOST)

Method: 2points
Sample : STD1 and STD3

Current Mode

```
H|¥^&|||H7600^1||||HOST|ECUPL^REAL|P|1<CR>
 M|1|ECR|••••••|^^^601|LOT|E11|12345678|123456|0|12345678|O|I^O^--------------------¥M^O^-----¥S^O^-
 ------------------¥R^1.00¥D^O^-----¥F^O¥Y^O^-----|¥¥¥¥|1.50^2.50^3.50^4.50^5.50|g/L|||2000070410384
 8<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|ECUPL^REAL|P|1<CR>
 M|1|ECR|••••••|^^^601|LOT|E11|12345678|123456|0|12345678|O|I^O^--------------------¥M^O^-----¥S^O^-
 ------------------¥R^1.00¥D^O^-----¥F^O¥Y^O^-----|¥¥¥¥|1.50^2.50^3.50^4.50^5.50|g/L|||2000070410384
 8<CR>
L|1|N<CR>
```

<M Record: Refer to “7.3.5(12) ISE Calibration Result Record”>

(ii) Case 2 (7600 to HOST)

Current Mode

```
H|¥^&|||H7600^1||||HOST|ECUPL^REAL|P|1<CR>
  M|1|ECR|••••••|^^^610|LOT|E11|12345678|123456|0|12345678|O|I^O^--------¥D^O^--¥L^O¥B^O^--------¥F^O
  ¥Y^O^--|¥¥¥¥||g/L|2.30|20.00^600.0|20000630113404<CR>
 L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|ECUPL^REAL|P|1<CR>
  M|1|ECR|••••••|^^^610|LOT|E11|12345678|123456|0|12345678|O|I^O^--------¥D^O^--¥L^O¥B^O^--------¥F^O
  ¥Y^O^--|¥¥¥¥||g/L|2.30|20.00^600.0|20000630113404<CR>
L|1|N<CR>
```

(6) Other

In this section, messages which requires special attention are explained.
Bold Italic part should be checked.

(a) Cancel of TS Inquiry

7600 sends this message to cancel inquiry when timeout occurs or so.
End “A” in Q record means cancel of inquiry.
Current Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
  P|1<CR>
    Q|1|^^0/••••••••••••••••••••••••••••••••/12/4001/5/R1/S|||||||||A<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
    Q|1|^^••••••••••••••••••••••^1^4001^5^^S1^SC||ALL|||||||A<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>

When HOST receives cancel message, DO NOT RESPOND to it.
But, HOST can transmit TS as Batch TS Transmission after received.

(b) Example of escape Delimiter (1) <“&X2F&” means “/”>

Refer 7.4.3(3)(a) for normal ID mode TS Inquiry.

(i) TS Inquiry (7600 to HOST)

Current Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
  P|1<CR>
    Q|1|^^0/&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&&X2F&/1
    /5113/2/R1/R|||||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1<CR>
   Q|1|^^//////////////////////^0^5113^2^^S1^SC||ALL|||||||O<CR>
L|1|N<CR>
```

<Q Record: Refer to “7.3.5(10) Request Information Record”>
In Q record “/” is preserved as delimiter, so “/” of ID must be replaced with “&X2F” using escape delimiter “&”.

(ii) Respond to inquiry (HOST to 7600)

Current Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
    O|1|0^/////////////////////^1^5113^2|R1|^^^601/¥^^^602/dec¥^^^603/400|R||20000630150536||||N||48^Y^M
    ||||||comment1^comment2^comment3^comment4^comment5||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1|||||H7600|TSDWN^REPLY|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|/////////////////////|0^5113^2^^S1^SC|^^^601^¥^^^602^dec¥^^^603^400|R||20000630150536||||N||||1|
    |||||||||O<CR>
    C|1|I|comment1^comment2^comment3^comment4^comment5|G<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>

(iii) Batch transmission of above sample (7600 to HOST)

Current Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^BATCH|P|1<CR>
  P|1<CR>
    O|1|0^////////////////////^1^5113^1|R2|^^^601/1|R|||||N||^^||SC|||••••••|comment1••••••••••••••••••
    ••^comment2••••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|||20000630151732|||O<CR>
      R|1|^^^601/1/not|2.00|g/L||N||F|||||E12<CR>
        C|1|I|0|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^BATCH|P|1<CR>
  P|1|||||||M||||||48^Y<CR>
    O|1|////////////////////////|0^5113^1^^S1^SC|^^^601^1|R||20000630150536||||N||||1|||||||20000630151732|
    ||F<CR>
     C|1|I|comment1••••••••••••••••••••^comment2••••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|G<CR>
       R|1|^^^601/1/not|2.00|g/L||N||C||••••••|||E12<CR>
       C|1|I|0|I<CR>
L|1|N<CR>
```

<O Record: Refer to “7.3.5(7) Test Order Record”>
<R Record: Refer to “7.3.5(8) Result Record”>
<C Record: Refer to “7.3.5(9) Comment Record”>

(c) Example of Escape Delimiter (2)

(i) Batch Result transmission (7600 to HOST)

(In case of ID = "|¥^&/" in ID mode)

Current Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^BATCH|P|1<CR>
 P|1<CR>
  O|1|0^••••••••••••••••••&F&&S&&R&&E&/^1^5113^1|R1|^^^601/1|R||||||N||^^||SC|||••••••|comment1•••••
  •••••••••••••••••^comment2•••••••••••••••^comment3••••••••••••^comment4•••••••^comment5••|||20
  000630150536|||F<CR>
   R|1|^^^601/1/not|2.00|g/L||N||F|||||E12<CR>
    C|1|I|0|I<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||H7600^1|||||HOST|RSUPL^BATCH|P|1<CR>
 P|1|||||||M||||||48^Y<CR>
  O|1|••••••••••••••••••&F&&S&&R&&E&/|0^5113^1^^S1^SC|^^^601^1|R||20000630150536||||N||||1|||||||200006
  30151732|||F<CR>
   C|1|I|comment1•••••••••••••••••••^comment2•••••••••••••••^comment3••••••••••^comment4•••••••^comment5••|GR|1|^^
   ^601/1/not|2.00|g/L||N||F||••••••|||E12<CR>
    C|1|I|0|I<CR>
L|1|N<CR>
```

<O Record: Refer to "7.3.5(7) Test Order Record">
<R Record: Refer to "7.3.5(8) Result Record">
<C Record: Refer to "7.3.5(9) Comment Record">

(d) Respond to inquiry without Test Selection (HOST to 7600)

Current Mode

```
H|¥^&|||HOST^1||||H7600|TSDWN^REPLY|P|1<CR>
  P|1<CR>
  O|1|0^·········1234567890123^1^5001^1|R1||R||20000630150536||||N||48^Y^M||||||comment1^comment2^commen
  t3^comment4^comment5||||||O<CR>
L|1|N<CR>
```

New Mode

```
H|¥^&|||HOST^1||||H7600|TSDWN^REPLY|P|1<CR>
 P|1|||||||M||||||48^Y<CR>
  O|1|·········1234567890123|0^5001^1^^S1^SC||R||20000630131236||||N||||1||||||||||F<CR>
    C|1|I|comment1^comment2^comment3^comment4^comment5|G<CR>
L|1|N<CR>
```

When the Host has no Test Order , (5)Universal Test ID of the O Record must be Null.
<O Record: Refer to “7.3.5(7) Test Order Record”>

7.4.5 Communication Example of ASTM Lower Layer

In this section , Example of communication between 7600 and HOST is shown based on “7.3.6 ASTM Lower Layer” (ASTM1381-91)

Example messages are shown with Control character like <STX>,<ETX> and frame is divided into 240 characters of text without Control Characters.

Check sam value, Frame and characters are reflect the specification.

(1) Realtime TS inquiry

Mode : Sample No. Mode
Sample Type : Serum
Sample Number: 1234

(*1)S : transmission from 7600 to HOST. R : transmission from HOST to 7600.

1	1997/09/29	11:34:05	S(*1)	**<ENQ>**
2	1997/09/29	11:34:06	R	**<ACK>**
3	1997/09/29	11:34:06	S	**<STX>1**H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1**<CR>**
				P|1**<CR>**
				Q|1|^^1234/Thisisasample/1/5036/1/R1/R|||||||||O**<CR>**
				L|1|N**<CR><ETX>31<CR><LF>**
4	1997/09/29	11:34:06	R	**<ACK>**
5	1997/09/29	11:34:07	S	**<EOT>**
6	1997/09/29	11:34:08	R	**<ENQ>**
7	1997/09/29	11:34:08	S	**<ACK>**
8	1997/09/29	11:34:09	R	**<STX>1**H|¥^&|||HOST^1||||H7600|TSDWN^REPLY|P|1**<CR>**
				P|1**<CR>**
				O|1|1234^ ^1^5036^1|R1|^^^1/¥^^^2/clr¥^^^3/inc¥^^^4/dec¥^^^5/clr|R||19970612150536|||N||48^Y^M|||||comment1^comment2^comment3^comment4^comment5|||||O**<CR>**
				L|1|N**<CR><ETX>BC<CR><LF>**
9	1997/09/29	11:34:09	S	**<ACK>**
10	1997/09/29	11:34:09	R	**<EOT>**

(2) Case: 7600 is not ready to receive.

1	1997/09/29	13:37:28	R	**<ENQ>**
2	1997/09/29	13:37:28	S	**<NAK>**
3	1997/09/29	13:37:33	S	**<ENQ>**
4	1997/09/29	13:37:33	R	**<ACK>**
5	1997/09/29	13:37:33	S	**<STX>1**H|¥^&|||H7600^1||||HOST|TSREQ^REAL|P|1**<CR>**
				P|1**<CR>**
				Q|1|^^1/ /1/5001/1/R1/R||||||||O **<CR>**
				L|1|N**<CR><ETX>D9<CR><LF>**
6	1997/09/29	13:37:33	R	**<ACK>**
7	1997/09/29	13:37:33	S	**<EOT>**

No. 1 7600 receive <ENQ> from HOST
No. 2 Because 7600 is not ready to receive, 7600 send <NAK>.
No. 3 7600 Send <ENQ> to start TS inquiry. After this step, TS inquiry starts successfully.

HOST can retry after receiving <NAK>.

(3) Link Contention

<table>
<tr><td>1</td><td>1998/03/03</td><td>22:58:38</td><td>S</td><td>**<ENQ>**</td></tr>
<tr><td>2</td><td>1998/03/03</td><td>22:58:38</td><td>R</td><td>**<ACK>**</td></tr>
<tr><td rowspan="4">3</td><td rowspan="4">1998/03/03</td><td rowspan="4">22:58:38</td><td rowspan="4">S</td><td>**<STX>1**H|¥^&|||7600MOSYS^1|||||KEISOKU-TOOL|TSREQ^REAL
|P|1
<CR></td></tr>
<tr><td>P|1**<CR>**</td></tr>
<tr><td>Q|1|^^0/••99001296021/1/5101/1/R1/R||||||||||O**<CR>**</td></tr>
<tr><td>L|1|N**<CR><ETX>4B<CR><LF>**</td></tr>
<tr><td>4</td><td>1998/03/03</td><td>22:58:38</td><td>R</td><td>**<ACK>**</td></tr>
<tr><td>5</td><td>1998/03/03</td><td>22:58:38</td><td>S</td><td>**<EOT>**</td></tr>
<tr><td>6</td><td>1998/03/03</td><td>22:58:40</td><td>S</td><td>**<ENQ>**</td></tr>
<tr><td>7</td><td>1998/03/03</td><td>22:58:40</td><td>R</td><td>**<ENQ>**</td></tr>
<tr><td>8</td><td>1998/03/03</td><td>22:58:41</td><td>S</td><td>**<ENQ>**</td></tr>
<tr><td>9</td><td>1998/03/03</td><td>22:58:41</td><td>R</td><td>**<ACK>**</td></tr>
<tr><td rowspan="3">10</td><td rowspan="3">1998/03/03</td><td rowspan="3">22:58:41</td><td rowspan="3">S</td><td>**<STX>1**H|¥^&|||7600MOSYS^1|||||KEISOKU-TOOL|RSUPL^BATC
H|P|1**<CR>**</td></tr>
<tr><td>P|1**<CR>**</td></tr>
<tr><td>O|1|0^••99001296021^1^5101^1|R1|^^^81/¥^^^1/¥^^^2/¥^^
^3/¥^^^4/¥^^^5/¥^^^6/¥^^^7/¥^^^21/¥^^^22/¥^^^23/¥^^^2
4/¥^^^26/¥^^^27/¥^^^31/¥^^^41/¥^^^42/¥^^^43/¥^^^44/¥^
^^45/¥^^^46/¥^^^9/¥^^^32**<ETB>D5<CR><LF>**</td></tr>
<tr><td>11</td><td>1998/03/03</td><td>22:58:42</td><td>R</td><td>**<ACK>**</td></tr>
<tr><td>12</td><td>1998/03/03</td><td>22:58:42</td><td>S</td><td>**<STX>2**/¥^^^33/¥^^^34/¥^^^35/¥^^^36/¥^^^37/¥^^^8/¥^^^5
6/¥^^^989/¥^^^990/¥^^^991/|R||||||N||^^||SC|||••••••
|••••••••••••••••••••••••••••••^••••••••••••••••••
•••••••^••••••••••••••••••••^•••••••••••••••^•••••
•••••|||19980303205148|||F**<CR>**
R|1|^^^81/|1.7**<ETB>C1<CR><LF>**</td></tr>
<tr><td>13</td><td>1998/03/03</td><td>22:58:42</td><td>R</td><td>**<ACK>**</td></tr>
<tr><td rowspan="3">14</td><td rowspan="3">1998/03/03</td><td rowspan="3">22:58:42</td><td rowspan="3">S</td><td>**<STX>3**2|mg/l||N||F|||||D1**<CR>**</td></tr>
<tr><td>C|1|I|0|I**<CR>**</td></tr>
<tr><td>R|2|^^^1/|86|U/l||N||F|||||D1**<CR>**</td></tr>
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				C|1|I|0|I**<CR>**
				R|3|^^^2/|97|U/l||N||F||||D1**<CR>**
				C|1|I|0|I**<CR>**
				R|4|^^^3/|277|U/l||N||F||||D1**<CR>**
				C|1|I|0|I**<CR>**
				R|5|^^^4/|596|U/l||N||F||||D1**<CR>**
				C|1|I|0|I**<CR>**
				R|6|^^^5/|136|U/l||N||F||||D1**<CR>**
				C|1|I|0|I**<CR>**
				R|7|^^^**<ETB>06<CR><LF>**
15	1998/03/03	22:58:43	R	**<ACK>**
16	1998/03/03	22:58:43	S	**<STX>4**6/|170|U/l||N||F||||D1**<CR>**
				C|1|I|0|I**<CR>**
				R|8|^^^7/|310|U/l||N||F||||D1**<CR>**
				C|1|I|0|I**<CR>**
				R|9|^^^21/|31.2|mg/dl||N||F||||D2**<CR>**
				C|1|I|0|I**<CR>**
				R|10|^^^22/|3.62|mg/dl||N||F||||D2**<CR>**
				C|1|I|0|I**<CR>**
				R|11|^^^23/|6.3|mg/dl||N||F||||D2**<CR>**
				C|1|I|0|I**<CR>**
				R|12|^^^24/|7.1|g/dl||N||F|||**<ETB>98<CR><LF>**
17	1998/03/03	22:58:43	R	**<ACK>**
18	1998/03/03	22:58:43	S	**<STX>5**||D2**<CR>**
				C|1|I|0|I**<CR>**
				R|13|^^^26/|0.00|mg/l||LL||F||||D2**<CR>**
				C|1|I|27|I**<CR>**

				R|14|^^^27/|-0.03|mg/l||LL||F|||||D2**<CR>**
				C|1|I|27|I**<CR>**
				R|15|^^^31/|160|mg/dl||N||F|||||D2**<CR>**
				C|1|I|0|I**<CR>**
				R|16|^^^41/|181|ug/dl||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|17|^^^42/|173|ug/dl||N||F||||P2**<CR>**
				C|1|I**<ETB>6B<CR><LF>**
19	1998/03/03	22:58:44	R	**<ACK>**
20	1998/03/03	22:58:44	S	**<STX>6**|0|I**<CR>**
				R|18|^^^43/|12.9|mg/dl||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|19|^^^44/|6.7|mg/dl||N||F||||P2**<CR>** C|1|I|0|I**<CR>** R|20|^^^45/|3.3|mg/dl||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|21|^^^46/|110|ug/dl||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|22|^^^9/|161|U/l||N||F||||P2**<CR>**
				C|1|I|0|I**<CR>**
				R|23|^^^32/|**<ETB>10<CR><LF>**
21	1998/03/03	22:58:45	R	**<ACK>**
22	1998/03/03	22:58:45	S	**<STX>7**92|mg/dl||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|24|^^^33/|39|mg/dl||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|25|^^^34/|176|mg/dl||N||F||||P2**<CR>**

				C|1|I|0|I**<CR>**
				R|26|^^^35/|1100|mEq/l||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|27|^^^36/|399|mg/dl||N||F||||P1**<CR>**
				C|1|I|0|I**<CR>**
				R|28|^^^37/|2.1|%||N||F||||**<ETB>93<CR><LF>**
23	1998/03/03	22:58:45	R	**<ACK>**
24	1998/03/03	22:58:45	S	**<STX>0**P2**<CR>**
				C|1|I|0|I**<CR>**
				R|29|^^^8/|250|g/l||N||F||||P2**<CR>**
				C|1|I|0|I**<CR>**
				R|30|^^^56/|64.9|mg/dl||N||F||||P2**<CR>**
				C|1|I|0|I**<CR>**
				R|31|^^^989/|148.9|mmol/l||N||F||||ISE1**<CR>**
				C|1|I|0|I**<CR>**
				R|32|^^^990/|5.53|mmol/l||N||F||||ISE1**<CR>**
				C|1|I|0|I**<CR>**
				R|33|^^^991/|108.9|mmol/l||N||F||||IS**<ETB>BF<CR><LF>**
25	1998/03/03	22:58:46	R	**<ACK>**
26	1998/03/03	22:58:46	S	**<STX>1**E1**<CR>**
				C|1|I|0|I**<CR>**
				L|1|N**<CR><ETX>BA<CR><LF>**
27	1998/03/03	22:58:46	R	**<ACK>**
28	1998/03/03	22:58:46	S	**<EOT>**
29	1998/03/03	22:58:46	R	**<ENQ>**
30	1998/03/03	22:58:46	S	**<ACK>**

31	1998/03/03	22:58:46	R	**<STX>1**H|¥^&|||HOST||||H7600|TSDWN^REPLY|P|1**<CR>**
				P|1**<CR>**
				O|1|0^••9900129602 1^1^5101^1|R1|^^^81/¥^^^1/¥^^^2/¥^^^3/¥^^^4/¥^^^5/¥^^^6/¥^^^7/¥^^^21/¥^^^22/¥^^^23/¥^^^24/¥^^^26/¥^^^27/¥^^^31/¥^^^41/¥^^^42/¥^^^43/¥^^^44/¥^^^45/¥^^^46/¥^^^9/¥^^^32/¥^^^33/¥^^^34**<ETB>E6<CR><LF>**
32	1998/03/03	22:58:47	S	**<ACK>**
33	1998/03/03	22:58:47	R	**<STX>2**/¥^^^35/¥^^^36/¥^^^37/¥^^^8/¥^^^55/¥^^^56/¥^^^989/¥^^^990/¥^^^991/|R|||||N||^^|||||^^^^|||||O**<CR>**
				L|1|N**<CR><ETX>94<CR><LF>**
34	1998/03/03	22:58:47	S	**<ACK>**
35	1998/03/03	22:58:48	R	**<EOT>**

~ No.5 TS down load successfully executed.
No.6,7 Link Contention has occored.
No.8 7600 send <ENQ> after 1 sec. again.
~ No.28 Bach result transmission successfully executed.
No.29~ HOST send TS inqired 7600 to HOST until No.5.
No.12,14,16 Middle flames are used <ETB>.
No.3,26,33 Filal frames are used <ETX>.
No.24 Because frame No. is over 7, it is 0.
No.26 Frame No. returnes to 0.

(4) Transmission Timeout

After 7600 send <ENQ>, Host did not send any response during 15 seconds. Link time out period is fixed as 15 seconds.

1	1997/09/29	14:35:05	S	**<ENQ>**
2	1997/09/29	14:35:20	S	**<EOT>**

(5) Sam Error

1	1997/09/29	14:44:08	R	**<ENQ>**
2	1997/09/29	14:44:08	S	**<ACK>**
3	1997/09/29	14:44:08	R	**<STX>1**H|¥^&|||HOST^1||||H7600|TSDWN^BATCH|P|1**<CR>**
				P|1**<CR>**
				O|1|0^ 287^1^5236^2|R1|^^^1/¥^^^5/|R||19970612150536||||N||^^||||||^^^^||||||O**<CR>**
				L|1|N**<CR><ETX>00<CR><LF>**
4	1997/09/29	14:44:09	S	**<NAK>**
5	1997/09/29	14:44:09	R	**<STX>1**H|¥^&|||HOST^1||||H7600|TSDWN^BATCH|P|1**<CR>**
				P|1**<CR>**
				O|1|0^ 287^1^5236^2|R1|^^^1/¥^^^5/|R||19970612150536||||N||^^||||||^^^^||||||O**<CR>**
				L|1|N**<CR><ETX>FC<CR><LF>**
6	1997/09/29	14:44:09	S	**<ACK>**
7	1997/09/29	14:44:09	R	**<EOT>**

No. 4 7600 recognized sam value “00” in 3rd frame (L6) is wrong, and send <NAK>

No. 5 HOST resent correct frame to 7600 and successfully complete.

(6) Protocol Error

1	1997/09/29	15:13:18	R	**<ENQ>**
2	1997/09/29	15:13:18	S	**<ACK>**
3	1997/09/29	15:13:18	R	**1**H|¥^&|||HOST^1||||H7600|TSDWN^BATCH|P|1**<CR>**
				P|1**<CR>**
				O|1|0^ 281^1^5231^1|R1|^^^1/¥^^^5/|R||19970612150536|||N||^^|||||^^^^|||||O**<CR>**
				L|1|N**<CR><ETX>F0<CR><LF>**
4	1997/09/29	15:13:18	S	**<NAK>**
5	1997/09/29	15:13:48	S	**<EOT>**

No. 3 Because this frame started without <STX>, 7600 sent <NAK> in No.4.
No. 5. 7600 waited for retry of HOST, but HOST did not send any message. 7600 stop the session by sending <EOT>