6.7 Communication Interface

Communication interface has 3 types as following. Adding to the conventional protocol (Type 3), 2 types of protocols have been newly added: one is 2-way communication requesting test information (Type 1), another is 1-way communication using the Type 1 protocol (Type 2).

All protocols are able to use a RS-232C connector (COM1A, 9pins) or a USB connector (COM1B) alternatively.

(1) 2-way communication (requesting test information) [Type 1]
Type 1 is a newly added protocol and is able to request test information (patient names, test names, etc.) from the FDC7000 to PC.
Type 1 sends test results, but the protocol is different from the conventional one-way protocol (Type 3).
When using this protocol, select [Type 1] in Mode 46.

(2) One-way communication (without requesting test information) [Type 2]
Type 2 is a one-way transmission of test results and its protocol is same as Type 1.
When using this protocol, select [Type 2] in Mode 46.

(3) One-way communication [Type 3]
Type 3 is the conventional one-way transmission.
When using this protocol, select [Type 3] in Mode 46.

6.8 2-way communication (requesting test information) [Type 1]

6.8.1 Applicability

This specification is applied to the communication procedures between PC and the FDC analyzer.

6.8.2 Purpose

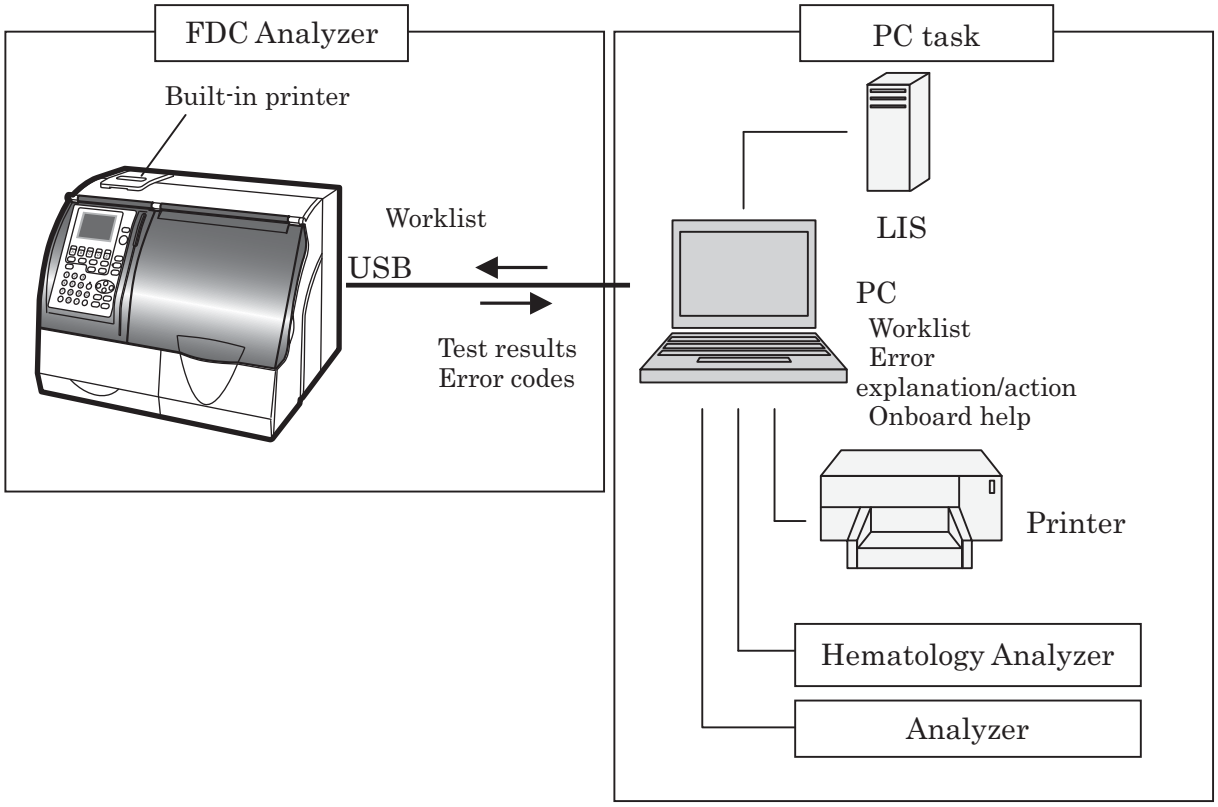
The current models in the market identify each patient and sample by using its coded information.

When using the current model, the analyzer's operators input an ID defined by PC in advance. So, the operators have to take care of sample treatments to prevent mistakes.

The new system defined by this document requests PC for the test information to enable the operator to check the information (sample ID, patient name, test menu, etc.) on the display or the printout of the analyzer, so as to reduce the risk of the sample treatment mistakes, and the operational cost by cutting the work sheet procedures.

6.8.3 System Configuration

The system configuration is shown as below.



6.8.4 Interface Specifications

(1) RS-232C (COM1A)

Data transfer rate	19200 bps
Communication method	Asynchronous communication method
Character length	8 bits
Stop bit	1 bit
Parity	No
Flow control	Hardware method（RTS, CTS）
Error detection	BCC (exclusive OR for all characters except for STX)

(2) USB (COM1B)

We will use an USB-UART bridge chip to establish USB interface with PC.

The following IC will be used:

Maker: Silicon Laboratories

Model: CP2102

Home Page: http://www.silabs.com/tgwWebApp/public/index.htm

The maker's Web sites are providing the virtual com port drivers. By using this driver, the application software of PC can be developed as same method of Windows standard com port access.

◆ Communication Interface

USB 2.0 Full Speed Compatible

(3) Control Specifications

(a) Time-out monitoring for transmission
Condition: CTS signal remains inactive for five seconds continuously.
Action: The analyzer clears the request and waits the next event (request).

(b) Time-out monitoring for receiving reply
Condition: Five seconds have passed without receiving the reply after sending the request command.
Action: The analyzer clears the request and waits the next event (request).

(c) Re-transmission
No re-transmission supported

6.8.5 Communication Data Format

(1) Communication Data System

(a) Text format

[STX (02H)], Command type, Parameter1, parameter2, ... [ETX (03H)] [BCC]

The parameters are added as required.

The " , “ (breakpoint) is inserted between a command type and a parameter and between parameters.

To connect some blocks, [ETB (17H)] is added at last.

Ex.)

STX	Command type	,	Parameter 1	,	Parameter 2	ETX	BCC

Ex.)

STX	Command type	,	Parameter 1-1	,	Parameter 1-2	ETB

Parameter 2-1	,	Parameter 2-2	ETX	BCC

(b) BCC

The calculation range for BCC is from the next of STX (command type) to ETX.

The calculation method is exclusive OR.

Ex.)

STX	Command type	,	Parameter 1	,	Parameter 2	ETX	BCC

Calculation range

(2) Communication Data

(a) Command type list

Request / Info (Analyzer => PC)		**Reply (PC => Analyzer)**	
Command type	Description	Command type	Description
W	Request for sample info	W	Reply for sample info
I	Request for Worklist index	I	Reply for Worklist index
S	Test start info		
R	Test results info		
E	Error info		

(b) Definition

Name	Description
Command type	Given by one alphabetical character
Sample No.*1	Assigned sample No. given by PC
Patient ID	Unique ID for a patient (e.g patient's file No.)
Patient name	Patient name
Sample type	W or P or U
Number of test	Number of tests for a sample
Test name	Requested test name
Worklist index	A set of a sample No., a patient ID, a patient name and others
Species	Unique No. assigned for species
Reception No.	No. for a patient (unique No. within a working day)

*1 Sample No.: When PC assigns a number, the format is "mmdd**" ["Month" + "Day" + "Number (starting 01)"]. (Ex. 122001) In the off-line mode, the format is "**" [Number (starting 01)] without month and day

6.8.6 Communication Data Details

(1) Request for Worklist index

This is used when the analyzer requests index information of the Worklist from PC.

Item	Character	Size	Description
Header	STX	1	STX: 02h
Command type	"I"	1	Request command for Worklist index (" I ": 49h)
Breakpoint	','	1	
Sample No.	Numerical	13	Max. 13 characters
Breakpoint	','	1	
Number of requests	Numerical	2	Maximum number of indexes to be requested(1 to 99)
Delimiter	EXT	1	ETX: 03h
BCC			

NOTE: - *Sample No. is the first key to search the Worklist. Blank data is allowable.*
- *The search direction is forward direction of the Worklist. But, the Worklist data which has already been informed to start the measurements will be searched last.*
- *The search results will be sent with the reply for the request (Worklist index).*

<Ex. 1> When requesting index information of 3 samples starting from sample ID "061201":

(Transmit data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	I	,	0	6	1	2	0	1	,	3	ETX			

□ = Space

<Ex. 2> When requesting index information of 3 samples without assigning a starting ID for search:

(Transmit data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	I	,	,	3	ETX									

□ = Space

(2) Reply for request (Worklist index)

This is used when PC sends index information of the Worklist to the analyzer.

Item	Character	Size	Description
Header	STX	1	STX: 02h
Command type	'I'	1	Request command for Worklist index (' I ': 49h)
Breakpoint	','	1	
Number of indexes	Numerical	2	Number of following indexes
Breakpoint	','	1	
Sample No. 1	Numerical	13	Max. 13 characters
Breakpoint	','	1	
Patient ID 1	Alphabetical & numerical	13	Max. 13 characters
Breakpoint	','	1	
Patient name 1	Alphabetical & numerical	13	Max. 13 characters
Breakpoint	','	1	
Species 1	Numerical	2	0 to 99
Breakpoint	','	1	
Sex 1	Numerical	1	0: Male 1: Female [9: Defined in (6)]
Breakpoint	','	1	
Age 1	Numerical	3	[999: Defined in (6)]
Block breakpoint	ETB	1	
...			
Sample No. n	Numerical	13	Max. 13 characters
Breakpoint	7,'	1	
Patient ID n	Alphabetical & numerical	13	Max. 13 characters
Breakpoint	','	1	
Patient name n	Alphabetical & numerical	13	Max. 13 characters
Breakpoint	','	1	
Species n	Numerical	2	0 to 99
Breakpoint	','	1	
Sex n	Numerical	1	0: Male 1: Female [9: Defined in (6)]
Breakpoint	','	1	
Age n	Numerical	3	[999: Defined in (6)]
Delimiter	ETX	1	ETX: 03h
BCC			

NOTE: - Number of indexes is essential.
- When no data in the Worklist, the “Number of indexes” should be 0 (zero). However, the sample No. send with the “Request for Worklist index” should be inserted into the data of the “Sample No. 1”.
- When the Worklist has test orders, the sample No. is essential, and either the patient ID or the patient name is essential in the Worklist data.
- In case that the sample No. is blank, or both the patient ID and the patient name are blank (even if the sample No. has data), the field is invalid.
- If a number of index fields is larger than the “Number of indexes”, overflowed fields (larger than the number of indexes) are ignored.
- If a number of index fields is smaller than the “Number of indexes”, the process will continue without error.
- A block breakpoint (ETB) must NOT be added at the end of the last index field.

<Ex.> When replying with 2 samples data:

1st sample info:	Sample ID	2006061201
	Patient ID	ABCDEFGHIJKLM
	Patient name	Taro Fuji
	Species	2: Feline
	Sex	1: Female
	Age	3 years
2nd sample info:	Sample ID	2006061202
	Patient ID	12345ABCD
	Patient name	Lucy Smith
	Species	1: Canine
	Sex	0: Male
	Age	1 year

(Transmit data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	I	,	2	,	2	0	0	6	0	6	1	2	0	1
2	,	A	B	C	D	E	F	G	H	I	J	K	L	M	,
3	T	a	r	o	□	F	u	j	i	,	2	,	1	,	3
4	ETB	2	0	0	6	0	6	1	2	0	2	,	1	2	3
5	4	5	A	B	C	D	,	L	u	c	y	□	S	m	i
6	t	h	,	1	,	0	,	1	ETX	BCC					

□ = Space

(3) Request for sample information

This is used when the analyzer requests sample information of the Worklist from PC.

Item	Character	Size	Description
Header	STX	1	STX: 02h
Command type	'W'	1	Request command for sample info ('W': 57h)
Breakpoint	','	1	
Sample No.	Numerical	13	Max. 13 characters
Breakpoint	','	1	
Patient ID	Alphabetical & numerical	13	Max. 13 characters
Breakpoint	','	1	
Patient name	Alphabetical & numerical	13	Max. 13 characters
Delimiter	ETX	1	ETX: 03h
BCC			

NOTE:

- Sample No., patient ID, and patient name are used for search keys. At least one of those information is required.

- Priority for the search keys is as follows: sample No. (1st), patient ID (2nd), patient name (last).

- The character data length for sample No., patient ID, and patient name is max. 13 characters. If the data length is under 13, it is NOT necessary to fill the data area with "space".

<Ex.> When requesting sample information for the 2nd sample:

2nd sample info:	Sample ID	2006061202
	Patient ID	12345ABCD
	Patient name	Lucy Smith

(Transmit data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	W	,	2	0	0	6	0	6	1	2	0	2	,	1
2	2	3	4	5	A	B	C	D	,	L	u	c	y	□	S
3	m	i	t	h	ETX	BCC									

□ = Space

(4) Reply for request (sample info)

This is used when PC sends sample information of the Worklist to the analyzer.

Item	Character	Size	Description
Header	STX	1	STX: 02h
Command type	'W'	1	Request command for sample info ('W': 57h)
Breakpoint	','	1	
Sample No.	Numerical	13	Max. 13 characters
Breakpoint	','	1	
Patient ID	Alphabetical & numerical	13	Max. 13 characters
Breakpoint	','	1	
Patient name	Alphabetical & numerical	13	Max. 13 characters
Breakpoint	','	1	
Number of tests	Numerical	2	0 to 30 slides
Breakpoint 1	','	1	
Test name 1	Alphabetical	8	Max. 8 characters
...			
Breakpoint n	','	1	
Test name n	Alphabetical	8	Max. 8 characters
Delimiter	ETX	1	ETX: 03h
BCC			

NOTE:

- Sample No. and number of tests are essential.
- If the "Number of tests" is "0", it means the Worklist does not have test orders.
- Test name field has maximum of 20 fields.
- If a number of test name fields is larger than the "Number of tests", overflowed fields (larger than the number of tests) are ignored.
- If a number of test name fields is smaller than the "Number of tests", the process will continue without error.
- <Processing of received data>
The received data ("Number of tests" and/or "Test name") is used as printout data for the built-in printer, and then will be deleted after the printout completed.
To re-print out the information, perform from the beginning of the process ("Request for Worklist index").
Also, the received data will not be used other purposes; e.g. for checking test results matching with the received data.

<Ex. 1> When replying for sample information of the 2nd sample:

Sample info:	Sample ID	2006061202
	Patient ID	12345ABCD
	Patient name	Lucy Smith
	Number of tests	4 tests
	Test names	BUN, CRE, GLU, ALP

(Transmit data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	W	,	2	0	0	6	0	6	1	2	0	2	,	1
2	2	3	4	5	A	B	C	D	,	L	u	c	y	□	S
3	m	i	t	h	,	4	,	B	U	N	,	C	R	E	,
4	G	L	U	,	A	L	P	ETX	BCC						

□ = Space

<Ex. 2> When replying for sample information of the 1st sample:

Sample info:	Sample ID	2006061201
	Patient ID	ABCDEFGHIJKLM
	Patient name	Taro Fuji
	Number of tests	1 panel
	Test names	Panel A

(Transmit data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	W	,	2	0	0	6	0	6	1	2	0	1	,	A
2	B	C	D	E	F	G	H	I	J	K	L	M	,	T	a
3	r	o	□	F	u	j	i	,	1	,	P	a	n	e	l
4	□	A	ETX	BCC											

□ = Space

(5) Test start information

This is used when the analyzer sends test start information to PC.

Item	Character	Size	Description
Header	02h	1	STX
Command type	'S'	1	Test start information command ('S': 53h)
Breakpoint	','	1	
Test condition	Alphabetical	7	Selecting control measurements or normal measurements CONTROL or NORMAL □ <□: Space (20h)>
Breakpoint	','	1	
Test date	Numerical	10	Year, month, and day when the measurements were performed. (Ex. 2006-09-25)
Breakpoint	','	1	
Test time	Numerical	5	Time when the measurements were performed. (Ex. 10:50)
Breakpoint	','	1	
Sample No.	Numerical	13	Unique ID for each sample
Breakpoint	','	1	
Patient ID	Alphabetical & numerical	13	Unique ID for each patient
Breakpoint	','	1	
Patient name	Alphabetical & numerical	13	Patient name
Breakpoint	','	1	
Sample position	Numerical	2	Sample position on the sample disk
Delimiter	03h	1	ETX
BCC			

◆ Each data area is a fixed-length field, so that data should be embedded from the left and spaces (20h) should be embedded in the remaining spaces.

◆ The sample position should be fixed as "01".

<Ex.> When the test for the 1st sample starts on June 12, 2006 at 10:50:

Sample info:	Sample ID	2006061201
	Patient ID	ABCDEFGHIJKLM
	Patient name	Taro Fuji

(Transmit data)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	S	,	N	O	R	M	A	L	□	,	2	0	0	6
2	-	0	6	-	1	2	,	1	0	:	5	0	,	2	0
3	0	6	0	6	1	2	0	1	□	□	□	,	A	B	C
4	D	E	F	G	H	I	J	K	L	M	,	T	a	r	o
5	□	F	u	j	i	□	□	□	□	,	0	1	ETX	BCC	

□ = Space

(6) Test results information (For two-way & one-way communication)

This is used when the analyzer sends test results to PC.

Item	Character	Size	Description
Header	02h	1	STX
Command type	'R'	1	Test results inform command ('R': 52h)
Breakpoint	','	1	
Test condition	Alphabetical	7	Selecting control measurements or normal measurements
Breakpoint	','	1	
Test date	Numerical	10	Year, month, and day when the measurements were performed. (Ex: 2006-09-25)
Breakpoint	','	1	
Test time	Numerical	5	Time when the measurements were performed.(Ex: 10:50)
Breakpoint	','	1	
Sample No.	Numerical	13	Unique ID for each sample
Breakpoint	','	1	
Patient ID	Alphabetical & numerical	13	Unique ID for each patient
Breakpoint	','	1	
Patient name	Alphabetical & numerical	13	Patient name
Breakpoint	','	1	
Species	Numerical	2	00 - 99
Breakpoint	','	1	
Sex	Numerical	1	0: Male 1: Female 9: Stand-alone mode
Breakpoint	','	1	
Age	Numerical	3	999: Stand-alone mode
Breakpoint	','	1	
Sample position	Numerical	2	Sample position on the sample disk
Breakpoint	','	1	
Number of tests	Numerical	2	00 to 20 slides
Breakpoint	','	1	
Test name	Alphabetical & numerical	8	Test name (5 characters) + Sample type (2 characters)
Breakpoint	','	1	
Equal sign		1	Equal sign or unequal signs
Breakpoint	','	1	
Test result	Alphabetical & numerical	9	Test result (9 characters)
Unit	Alphabetical & numerical	6	Unit (6 characters)
Breakpoint	','	1	
Dilution factor	Numerical	2	Used dilution factor (from 01)
Breakpoint	','	1	
Reference interval lower limit	Numerical	5	Setting of reference interval lower limit
Breakpoint	','	1	
Reference interval upper limit	Numerical	5	Setting of reference interval upper limit
Breakpoint	','	1	
Warning	Alphabetical	11	As stated following
Test name breakpoint	','	1	Breakpoint
Delimiter	03h	1	ETX

Test result field

NOTE:

- The test result field has "Number of tests" of test results.
- A test name breakpoint must NOT be added at the end of the last test result field.
- Each data area is a fixed-length field, so that data should be embedded from the left and spaces (20h) should be embedded in the remaining spaces.
- "Sex" and "Age" fields (See the Description of the "Sex" and "Age" (previous page).) For 2-way communication, given data from PC [see (2)] will be embedded (copied). For stand-alone mode, "9" will be embedded in the Sex fields, "999" will be embedded in the Age field.

Warning characters

The below table indicates warning character allocation in the warning data area.

When no error has occurred for each, a space (20h) will be embedded.

Position (sending order)	Warning character	Description
1st	H	Testing value exceeds the upper limit of the preset reference interval.
	L	Testing value falls below the lower limit of the preset reference interval.
2nd	@	Testing value is outside of the determination range.
3rd	#	The valid term of the slide has expired.
4th	$	Temperature control error (thermistor disconnection)
	+	Temperature control error (Incubator temperature has exceeded the upper limit of the range.)
	-	Temperature control error (Incubator temperature has fallen below the lower limit of the range.)
5th	*	Photometer malfunction (white plate fluctuation)
	?	Photometer malfunction (out of the white plate range)
6th		Always a space (20h)
7th	&	Abnormally high testing value
8th		Always a space (20h)
9th	E	Calculation error or malfunction of ISE test results
10th	¥	Un-spotted slide
11th		Always a space (20h)

Transmission example

<Printout example>

```
09-05-10   10:50  Pos B
No.1234567890123
ID:ABCDEFGHIJKLM
[Cat]
GLU-PS    @+*? ¥# E
       = 75    mg/dl
(10)    ( 50.0-100.0)
AMYL-PS   H     #
       > 1500    U/l
       ( 500 - 1500)
```

<Transmit data>

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	R	,	N	O	R	M	A	L	□	,	2	0	0	9
2	-	0	5	-	1	0	,	1	0	:	5	0	,	1	2
3	3	4	5	6	7	8	9	0	1	2	3	,	A	B	C
4	D	E	F	G	H	I	J	K	L	M	,	□	□	□	□
5	□	□	□	□	□	□	□	□	□	,	0	2	,	9	,
6	9	9	9	,	0	2	,	0	2	,	G	L	U	-	P
7	S	□	□	,	=	7	5	□	□	□	□	□	□	□	m
8	g	/	d	l	□	,	1	0	,	5	0	.	0	□	,
9	1	0	0	.	0	,	□	@	#	+	*	□	□	□	E
10	□	□	,	A	M	Y	L	-	P	S	□	,	>	,	1
11	5	0	0	□	□	□	□	U	/	l	□	□	□	,	0
12	1	,	5	0	0	□	□	,	1	5	0	0	□	,	H
13	□	#	□	□	□	□	□	□	□	□	ETX	BCC			

□ = Space

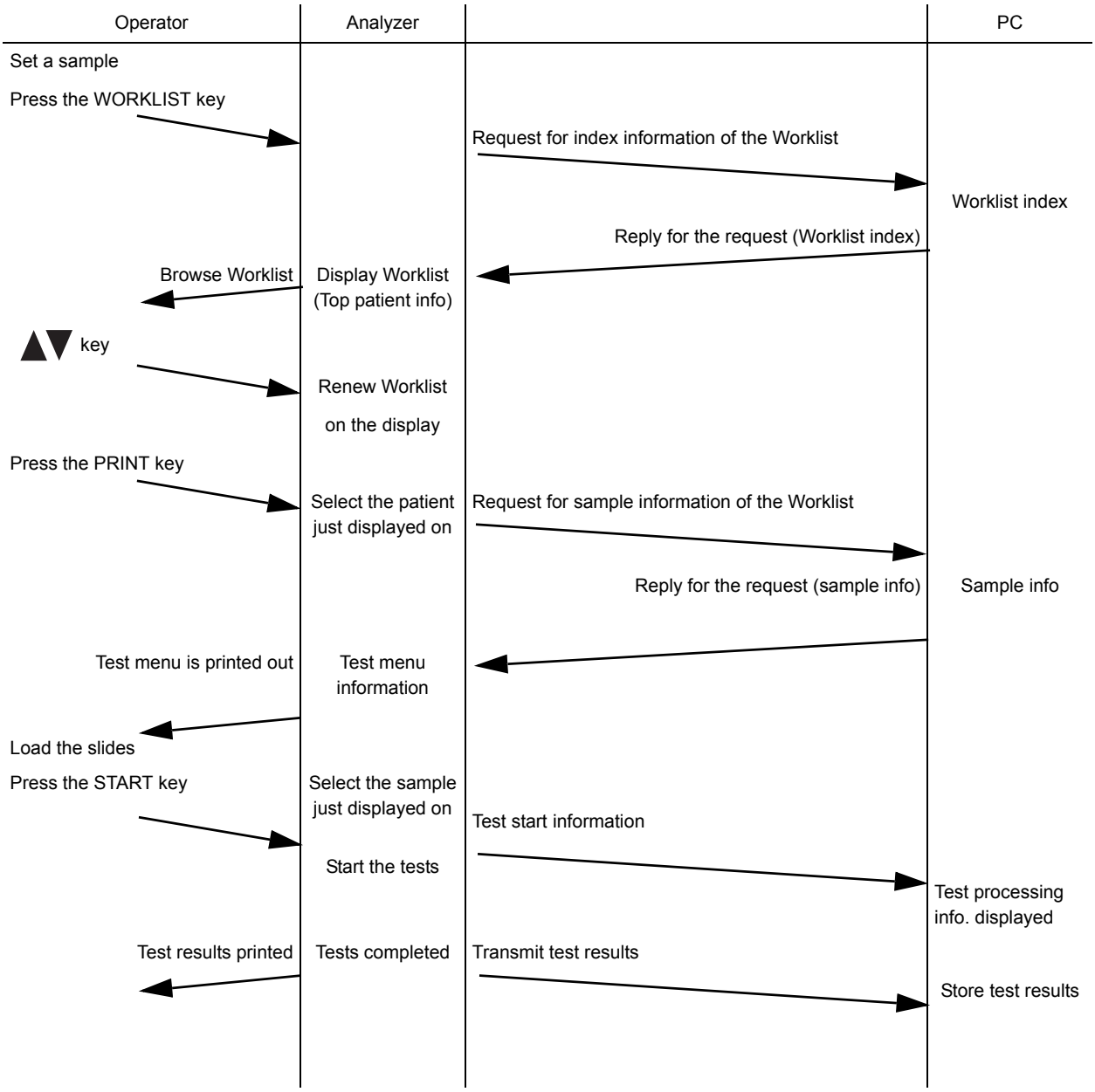
(7) Test results information (One-way communication)

In the case of one-way communication, this function is used to send tests results from the analyzer to PC.

The communication data format for the one-way communication is same as "(6) Test results information (For two-way & one-way communication)".

6.8.7 Data Transmission Flow

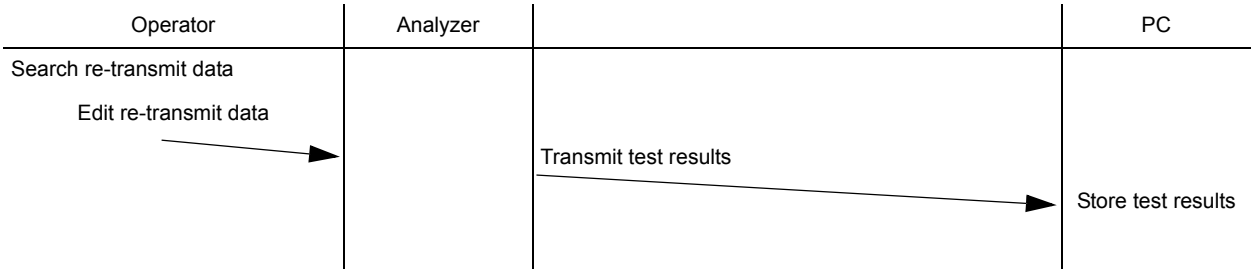
(1) Single sample test



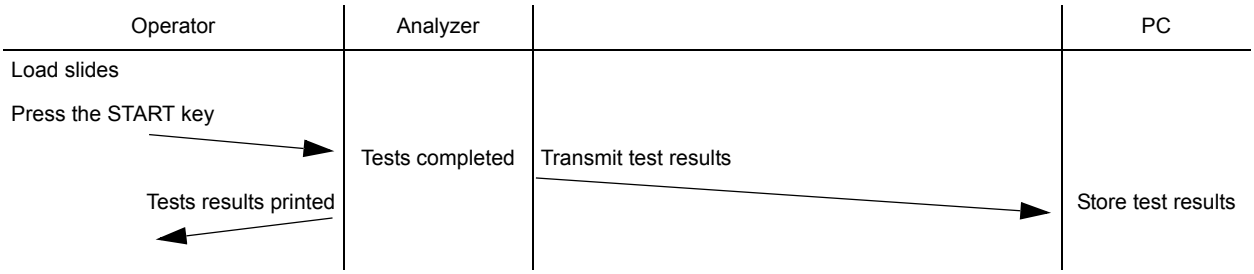
- Pressing the WORKLIST key requests Worklist index information.
- Pressing the PRINT key selects the sample just displayed on the display to request sample information of Worklist.
- When using a sample barcode reader, reading a barcode selects a patient ID to request sample information using the patient ID as a key.
- Pressing the START key selects the patient's sample which is just displayed on the display to start the testing.

(2) Re-transmitting test results

This function is used to re-transmit test results manually. (This is useful when electric power failure or cable disconnection caused the communication interruption.)



(3) Transmitting test results (One-way communication)



6.9 One-way Communication [Type 3 (Conventional Protocol)]

6.9.1 Communication Parameters

Data transfer rate	19200 bps (V3.0-P01 or later) 1200, 9600, 19200 bps (up to V2.0)
Selectable Communication type	Serial interface
Communication method	Asynchronous communication method
Character length	ASCII 8 bits
Stop bit	1 bit (V3.0-P01 or later) (up to V2.0, 2-bits is selectable)
Parity	No
BCC	No (V3.0-P01 or later) (up to V2.0, Yes (EOR) is selectable)
DSR check:	No
Hand shaking	CTS/RTS control

6.9.2 Data Transmission Specification

Transmission data is fixed-length and the unused data space is expressed as a space data (20H).

NOTE: □ = Space data (20H)

(1) Transmission timing
All data of one sample is transmitted after the last test of-belonging to the sample has been completed.

(2) Transmission interval
The transmission interval between the data and the previous data is at least 3 seconds.

(3) Test conditions
Test results of calibration are not transmitted. Test information whether in the normal or in the control mode is transmitted.

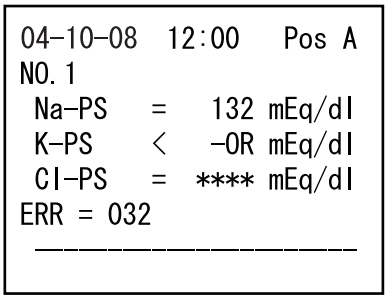
(4) Transmission data format
Transmission order: [STX] => [Test results] => [ETX] => [BCC]

STX	(02H)	1 character data length
Test condition	Test information whether in the normal or in the control mode	7 characters data length
Test date	Test date (Ex. 2014-07-25)	10 characters data length
Test time	Test time (Ex. 17:59)	5 characters data length
Sequence number	Specific No. for the sample (Ex. 1234567890123)	13 characters data length
Sample ID	Specific ID for the sample (Ex. ABCDEFGHI-JKLM)	13 characters data length
Sample position	Sample position on the sample disk (Sample position A to E is 01 to 05.)	2 characters data length
Test name/ Sample type	Total 7 characters data length (5 characters data length for a test name and 2 characters length for a sample type) Sample type: "-W" (Whole blood), "-P" (Plasma/serum), "-U" (Urine), “-E” (Blank) (Ex.) AMYL-P□, CRP□□□□ In case that characters are less than 7, spaces are embedded. In case of CRP, 4 spaces will be embedded at the end (no "-" mark).	7 characters data length
Equal sign or unequal sign	Ex. = , <, or >	1 characters data length
Test results	[Test results (9 ch) + Unit (6 ch) + Dilution factor (2 ch) + Warning indications (11 ch) x number of test names Ex. 123456.78(+)mg/dl□(+)02(+)L@#$*F&PE\T	28 characters data length
ETX	(03H)	1 characters data length
BCC	Exclusive OR from STX to ETX	1 character data length

(5) Warning characters on test results

	Warning character	Description
1	L, H	The testing value is out of the preset Reference interval.
2	@	Qualitative range
3	#	The slide has expired.
4	$, +, -	Temperature control error
5	*, ?	Fluctuation of light source intensity
6	F	(PF pressure error)
7	&	Abnormal testing value
8		Always embedded in space (20h)
9	E	Calculation error or malfunction of ISE test results
10	¥	Un-spotted slide
11		Always embedded in space (20h)

When ISE test results have errors (drift error, impedance error, outside of range), the warning "E" is added on the 9th warning position of the transmitted data (on K and CL).



(6) Transmitting example
When the data for the following test result is transmitted:

```
09-05-10   10:50  Pos B
No.1234567890123
ID:ABCDEFGHIJKLM
GLU-PS     @+*? ¥# E
       = 12345   mg/dl
(10)    ( 50.0-100.0)
AMYL-PS   H      #
       > 1500    U/l
(2)     ( 500 - 1500)
```

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	STX	N	O	R	M	A	L	□	2	0	0	9	-	0	5
2	-	1	0	1	0	:	5	0	1	2	3	4	5	6	7
3	8	9	0	1	2	3	A	B	C	D	E	F	G	H	I
4	J	K	L	M	0	2	G	L	U	-	P	□	□	=	1
5	2	3	4	5	□	□	□	□	m	g	/	d	l	□	1
6	0	□	@	#	+	*	□	□	□	E	¥	□	A	M	Y
7	L	-	P	□	>	1	5	0	0	□	□	□	□	□	U
8	/	l	□	□	□	0	2	H	□	#	□	□	□	□	□
9	□	□	□	ETX											

NOTE: □= *Space data (20H)*

6.10 Serial Cable Connection (PC)

(1) Connecting to the host computer --- COM1 (9Pin), Cross connection