Automated Enzyme Immunoassay System

AIA-360

Host Computer Connection Specifications

Rev.0

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Contents

1 Introduction

This document describes the communication arrangements used when connecting the AIA-360 system to a host computer (hereinafter called a host).

2 Lower level control

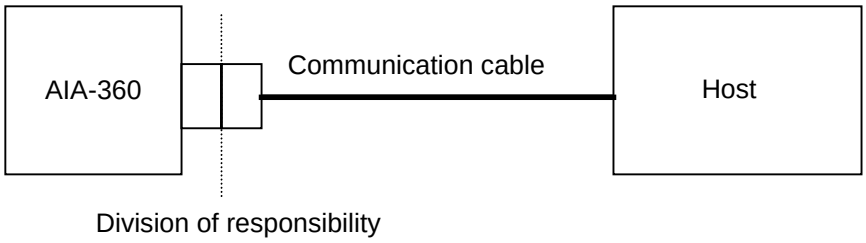
The following specifications apply to ASTM E 1381-91. For details, refer to E1381-91.

2.1 Communication specifications

Item	Specification
Transmission method	RS232C asynchronous, half duplex
Transmission rate	1200, 2400, 4800, 9600, 19200 bps
Transmission code	ASCII
Data length	7 bits, 8 bits
Parity	Even, odd, none
Stop bit	1 bit, 2 bits

__Standard value

2.2 Connections



2.3 Connector

D-SUB 9p (socket) is used as the cable connector on the AIA-360 side.

2.4 Pin assignment

AIA-360 side

Signal name	Pin No.
Receive data	2
Transmit data	3
Data terminal ready	4
Signal GND	5
Data set ready	6
Request to send	7
Clear to send	8

Host side (Example: 25 pins)

Pin No.	Signal name
1	Frame GND
2	Transmit data
3	Receive data
4	Request to send
5	Clear to send
6	Data set ready
7	Signal GND
20	Data terminal ready

3 Higher level control

The information prescribed below applies only to ASTM E 1394-91. Other information will be discarded at reception or not handled at transmission. For details, refer to E 1394-91.

Notes:

(1) For record transmission, store a single record in one low-level frame (do not store more than one record in one frame).

(2) In the following explanations, "Receive processing" refers to processing at data reception by the AIA-360 from the host and "Transmit data" refers to data sent by the AIA-360 to the host.

(3) In the following explanations, "Omit" indicates whether data may be omitted when the host

computer transmits a record to the AIA-360. If data is omitted, the value is determined according to the rules of the AIA-360 side.

(4) For record transmission from the host, ensure that the maximum allowable number of digits will not be exceeded.

3.1 Message header record (H)

Name	Max digits	Receive processing	Omit	Transmit data
Delimiter Definition	4	－Discard－	No	Delimiter set in AIA-360
Sender Name or ID	32	－Discard－	Yes	AIA-360
Date and Time of Message	14	－Discard－	Yes	Date and time of transmission YYYYMMDDHHMNSS

3.2 Patient information record (P)

Name	Max digits	Receive processing	Omit	Transmit data
Sequence Number	6	－Discard－	No	Serial number (from 1)
Practice Assigned Patient ID	14	－Discard－	Yes	Not Transmit
Patient Name	Last: 16 First: 16	－Discard－	Yes Yes	Not Transmit
Birth Date	8	－Discard－	Yes	Not Transmit
Patient Sex	1	－Discard－	Yes	Not Transmit

3.3 Test order record (O)

Name	Max digits	Receive processing	Omit	Transmit data
Sequence Number	6	－Discard－	No	Serial number (from 1)
Specimen ID	16	－Discard－	No	Specimen ID
Manufacturer's or Local Code	Analyte: 3 Dilution: 4	－Discard－, －Discard－	No Yes	Analyte (000 to 999), Dilution
Specimen Type	7	－Discard－	Yes	Not Transmit

3.4 Result record (R) – Concentration

Name	Max digits	Receive processing	Omit	Transmit data
Sequence Number	6	AIA-360 does not Receive this record	—	Serial number (from 1)
Manufacturer's or Local Code	3			Analyte (000 to 999)
Data or Measurement Value	8(12)			Concentration ZZZZZZ9 to 9.999999 (Z for zero suppression, decimal point position fixed for each analytical item) Format in case of a digit overflow above: ±9.99999E±99
Units	6			Unit (X6)
Reference Ranges	Low: 8 High: 8 28 max including "to"			Normal lower limit（Low) Normal upper limit（High) ZZZZZZ9 to 9.999999 (Z for zero suppression, decimal point position fixed for each analytical item) Format in case of a digit overflow above ±9.99999E±99 Low and high values separated by "to"
Result Abnormal Flags	2			Flag（See Table 1)
Result Status	1			Status F: Final
Operator Identification	10			Operator name
Date/Time Test Completed	14			Date and time of test completed YYYYMMDDHHMNSS

Note:

(1) The host must not transmit this result record to the AIA-360.

Table 1 shows the correspondence between flags used in the AIA-360 and for ASTM

communications.

ASTM flag	Meaning	AIA-360 internal flag
L	Lower than normal	L□
H	Higher than normal	H□
HH	Abnormally high	None
LL	Abnormally low	None
<	Outside the measuring range	<L
>	Outside the measuring range	>H
N	Normal	Blank
A	Measurement error	SE,MF,BS, SP,DS,SS,SC, NB,DO,NC,CE,IO,WU,BH, CV,DL,CL
U	-	None
D	-	None
B	-	None
W	-	None

Table 1

3.5 Result record (R) – Second R record (Rate value)

Name	Max digits	Receive processing	Omit	Transmit data
Sequence Number	6	AIA-360 does not receive this record	—	Serial number (from 1)
Manufacturer's or Local Code	4			Rate
Data or Measurement Value	7			Rate value Fraction: 3 digits (Note 4)
Units	4			nM/s
Result Abnormal Flags	1			Flag (See Table 2)
Operator Identification	10			Operator name
Date/Time Test Completed	14			Date and time of test completed YYYYMMDDHHMNSS

Notes:

(1) The AIA-360 transmits this record (second R record) when choosing the **RATE RS232C OUT** in the **System Spec**.

(2) The host must not transmit this result record to the AIA-360.

(3) NA is transmitted for no measurement (due to an error) and >667 for the DO flag (rate exceeding 667 nM/s).

Table 2 describes each flag.

Flag	Meaning
N	Rate value valid
A	Rate value not valid. The flag becomes A when the rate value is NA or >667.

Table 2

3.6 Comment record (C) – AIA-360 measuring flag

Name	Max digits	Receive processing	Omit	Transmit data
Sequence Number	6	AIA-360 does not receive this record	—	Serial number (from 1)
Comment Source	1			Always I
Comment Text	2 digits fixed			AIA-360 measuring flag
Comment Type	1			Always I

Notes:

(1) "Comment Text" (flag) is always 2 digits: two space characters for blank, H and one space character for H, and L and one space character for L.

(2) The host must not transmit this comment record to the AIA-360.

3.7 Request information record (Q)

Name	Max digits	Receive processing	Omit	Transmit data
Sequence Number	6	—Discard—	No	Serial number (from 1)
Starting Range ID Number	16	—Discard—	No	Not Transmit
Ending Range ID Number	16	—Discard—	Yes	Not Transmit
Manufacturer's or Local Code	3	—Discard—	No	Not Transmit

3.8 Message terminator record (L)

Name	Max digits	Receive processing	Omit	Transmit data
Sequence Number	1	—Discard—	No	Fixed at 1

3.9 Scientific record (S)

Not used

3.10 Manufacturer information record (M)

Not used

4 AIA-360 operations and actual communications

4.1 Measurement result transmission to the host

H, P, O, R, (second R), and L are transmitted to the host. The O and R records are transmitted as a pair.

4.1.1 General transmission examples

(Transmission example 1) When several measurement results are selected on the result screen and uploaded, the results are transmitted in the following format:

H|\^&|||AIA-360|||||||||19960910130500<CR>
P|1|96001|||^||19601002|<CR>
O|1|96000100000001||^^^001^51|||||||||| <CR>
R|1|^^^001|15.265|mg/ml|10.000 to 50.000|N||F||Operator||19960910121530<CR>
L|1<CR>
H|\^&|||AIA-360|||||||||19960910130500<CR>
P|1|96001|||^||19601002|<CR>
O|1|96000100000001||^^^002^1|||||||||| <CR>
R|1|^^^002|0.12|ng/ml|0.10 to 5.00|N||F||Operator||19960910121601<CR>
L|1<CR>
H|\^&|||AIA-360|||||||||19960910130500<CR>
P|1|96001|||^||19601002|<CR>
O|1|96000100000001||^^^003^100|||||||||| <CR>
R|1|^^^003|657|ug/ul|100 to 500|H||F||Operator||19960910121631<CR>
L|1<CR>

(Transmission example 2) When there is a second R record (**RATE RS232C OUT** in the **System Spec** is chosen)

H|\^&|||AIA-360|||||||||19960910130500<CR>
P|1|96001|||^||19601002|<CR>
O|1|96000100000001||^^^001^51||||||||||<CR>
R|1|^^^001|15.265|mg/ml|10.000 to 50.000|N||F||Operator||19960910121530<CR>
R|2|^^^Rate|22.125|nN/s||N||||||19960910121530<CR>
L|1<CR>